

GEOPDSE04P: B. REGIONAL PLANNING AND
RURAL DEVELOPMENT PRACTICAL

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Rural Research Method And Methodology

What is Research?

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words, research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.

What is Inductive Method ?

Inductive approaches are associated with [qualitative research](#)

What is Deductive Method ?

Deductive approaches are associated with [quantative research](#)

What is Qualitative Research ?

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

What is Quantative Research ?

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations

Characteristics of Good Research

- Good research follows a systematic approach to capture accurate data.
- Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

Research Data

Valid – founded, logical, rigorous, and impartial.

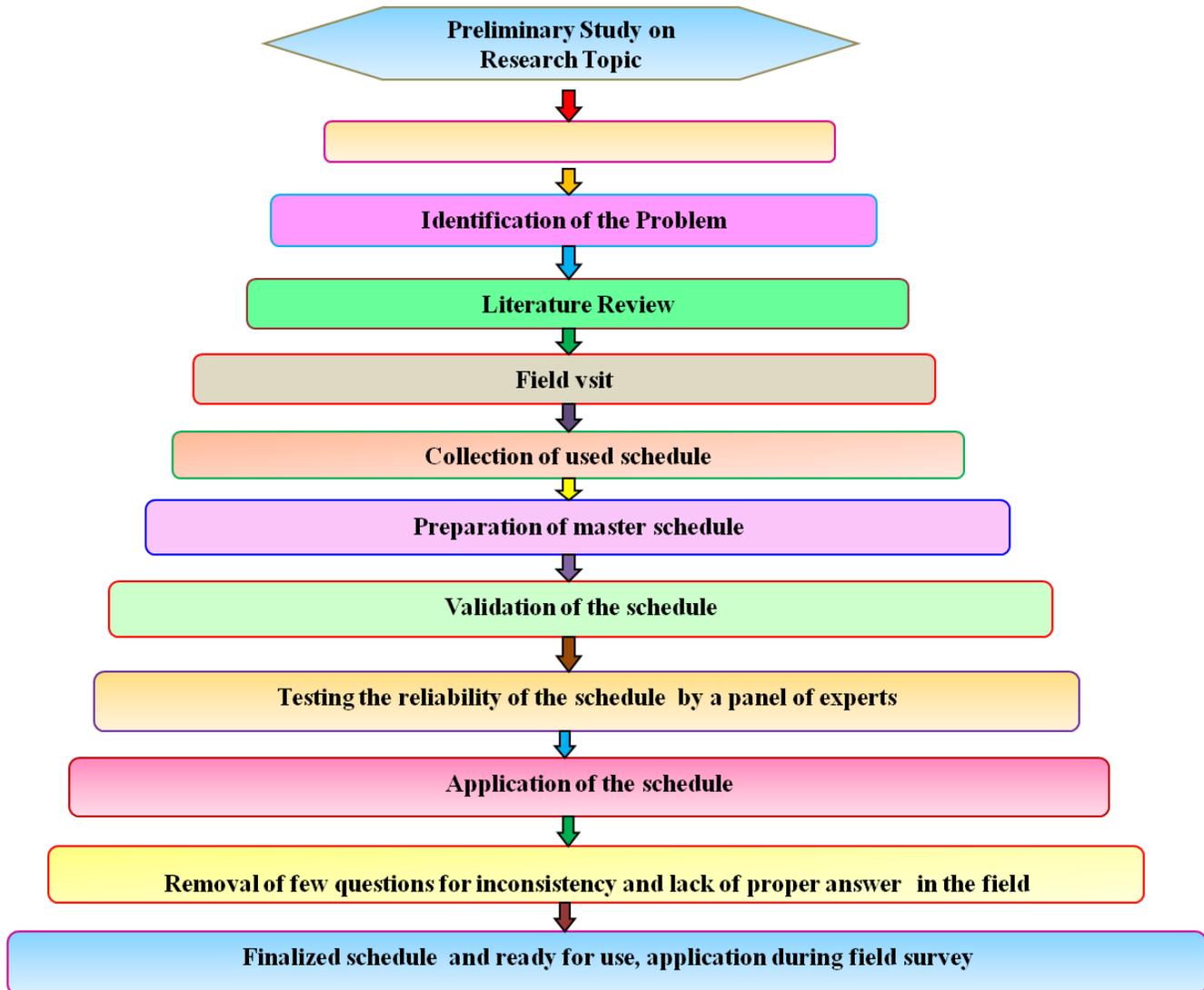
Accurate – free of errors and including required details.

Reliable – other people who investigate in the same way can produce similar results.

Timely – current and collected within an appropriate time frame.

Complete – includes all the data you need to support your business decisions.

Development of a Schedule



Focus Group Discussion

What is Focus Group Discussion (FGD)?

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Focus Group	Discussion Group
6-10 people	5-10 people
Should have trained moderator (guides the discussion)	Should have trained facilitator (responsible for the process)
Purpose is to answer a research question or collect data	Purpose is to make decision(s) about research process
Individuals are research participants	Individuals are research partners/ co-researchers
Power is with researcher	Power is shared between researcher and people in the group

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.

- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

Major steps involved in FGDs:-

- 1. Identify the type of respondents required as per the study**
- 2. Select moderator and field teams**
- 3. Develop facilitators' guide and format for recording responses**
- 4. Train field team and pre-test instruments**
- 5. Conduct FGD**
- 6. Transcribe, Analyse and Interpret Responses**

Dos and Don'ts:-

Dos

- Start with open questions.
- The first question should be general to get people warmed up, say about participants' views about the topic.
- If you hear of something you haven't heard of before, ask the person to tell you more about it.
- If someone gives a general answer, ask them to specify (give an example).
- If someone shares an opinion, check with others in the group whether they share the view.
- At the beginning, explain you will be confidential and assure them that the information they provide will not be misused. If there will be a report, explain who it will go to and how it will be used.
- Go around the room and get each person to answer your first question, to draw everyone in.
- Keep praising and thanking people for their contribution. Make them feel their contribution is welcome and worthwhile.
- Be sympathetic about the issues they raise, even if you think some are using the focus group as a bit of a whinge session.
- Regularly ask questions of specific people, to draw people in.
- Feel free to change the order of the questions if someone brings up something that relates to a later question.

Don'ts

- Do not ask leading questions (ones that might suggest you are looking for a particular answer).
- Do not ask 'yes or no' questions, as this does not open up discussion, though if you inadvertently do, you can follow up with 'why'?
- Do not ask double-barrelled questions. People cannot answer two questions at once.
- Do not tell people they are wrong. Do not correct them.
- Do not express any point of view.
- Generally, try not to shut people down. Welcome their contribution whatever it is.
- Never say, "We'll be talking about that later, not now."
- If someone seems really shy, do not pressurize them to speak.
- Do not be embarrassed if you don't understand something. Go ahead and ask for an explanation. Your mission is to explain the unknown, the unclear and the ambiguous.
- Never gossip about the focus groups after the study.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.
- Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not dominate it, and so that those participants who tend not to be highly verbal are able to share their views.
- Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Example (Opening)

Namaste ! Thank you all for taking the time to be with us today. My name is ..., and I am ... [position, affiliation]. My role is to facilitate this group discussion. I will be fully supported by and he/she will be in charge of taking notes and making observations. The purpose of this group discussion is to talk about

We will ask you some questions, which will take about 2 hours, and please tell us what you think is important. We want everyone to feel free to say exactly what you think, no matter what this may be [Introduce ground rules]. Everything you say here will be kept confidential and anonymous, so no-one will ever know what you personally said (only what the overall combined responses are).

In order to capture all that is said, we will record this session. Do you agree with your participation in this FGD? [get oral or written informed consent]

What Is a SWOT Analysis?

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats, and so a SWOT Analysis is a technique for assessing these four aspects of your business.

You can use SWOT Analysis to make the most of what you've got, to your organization's best advantage. And you can reduce the chances of failure, by understanding what you're lacking, and eliminating hazards that would otherwise catch you unawares.

Better still, you can start to craft a strategy that distinguishes you from your competitors, and so compete successfully in your market.

Strengths

Characteristics of a business which give it advantages over its competitors

Weaknesses

Characteristics of a business which make it disadvantageous relative to competitors

Opportunities

Elements in a company's external environment that allow it to formulate and implement strategies to increase profitability

Threats

Elements in the external environment that could endanger the integrity and profitability of the business

A SWOT analysis can offer helpful perspectives at any stage of an effort. You might use it to:

- Explore possibilities for new efforts or solutions to problems.
- Make decisions about the best path for your initiative. Identifying your opportunities for success in context of threats to success can clarify directions and choices.

- Determine where change is possible. If you are at a juncture or turning point, an inventory of your strengths and weaknesses can reveal priorities as well as possibilities.
- Adjust and refine plans mid-course. A new opportunity might open wider avenues, while a new threat could close a path that once existed.

SWOT also offers a simple way of communicating about your initiative or program and an excellent way to organize information you've gathered from studies or surveys.

HOW TO DO A SWOT ANALYSIS THE RIGHT WAY:-

As I mentioned above, you want to gather a team of people together to work on a SWOT analysis. You don't need an all-day retreat to get it done, though. One or two hours should be more than plenty.

1. Gather the right people

Gather people from different parts of your company and make sure that you have representatives from every department and team. You'll find that different groups within your company will have entirely different perspectives that will be critical to making your SWOT analysis successful.

2. Throw your ideas at the wall

Doing a SWOT analysis is similar to brainstorming meetings, and there are right and wrong ways to run them. I suggest giving everyone a pad of sticky-notes and have everyone quietly generate ideas on their own to start things off. This prevents groupthink and ensures that all voices are heard.

After five to 10 minutes of private brainstorming, put all the sticky-notes up on the wall and group similar ideas together. Allow anyone to add additional notes at this point if someone else's idea sparks a new thought.

3. Rank the ideas

Once all of the ideas are organized, it's time to rank the ideas. I like using a voting system where everyone gets five or ten "votes" that they can distribute in any way they like. Sticky dots in different colors are useful for this portion of the exercise.

Based on the voting exercise, you should have a prioritized list of ideas. Of course, the list is now up for discussion and debate, and someone in the room should be able to make the final call on the priority. This is usually the CEO, but it could be delegated to someone else in charge of business strategy.

3.2 APPLICATION OF STATISTICAL TECHNIQUES IN DEMOGRAPHIC DATA ANALYSIS:

Population Composition

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

SEX COMPOSITION:-

The number of women and men in a country is an important demographic characteristic. The ratio between the number of women and men in the population is called the Sex Ratio. In some countries it is calculated by using the formula:

$$\frac{\text{Male Population}}{\text{Female Population}} \times 1000$$

Or the number of males per thousand females.

In India, the sex ratio is worked out using the formula: $\frac{\text{Female Population}}{\text{Male Population}} \times 1000$

Or the number of females per thousand males.

In some countries the sex ratio is unfavorable to women because

- (i) Female foeticide
- (ii) Female infanticide
- (iii) Domestic violence against women
- (iv) Lower socio-economic status of women

In the world population sex ratio is 102 males per 100 females.

The highest sex ratio in the world is recorded in Latvia where there are 85 males per 100 females. In Qatar there are 311 males per 100 females.

The sex ratio is favorable for females in 139 countries of the world and unfavorable in remaining 72 countries. Asia has a low sex ratio in countries like China, India, Saudi Arabia, Pakistan, and Afghanistan.

Latvia, Lithuania, Armenia, Belarus, Russia, Ukraine and Estonia are among the countries with the largest female population. This shows the better status of women and an excessively male –dominated out –migration to different parts of the world.

THE AGE-STRUCTURE:-

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

THE SEX RATIO:-

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females

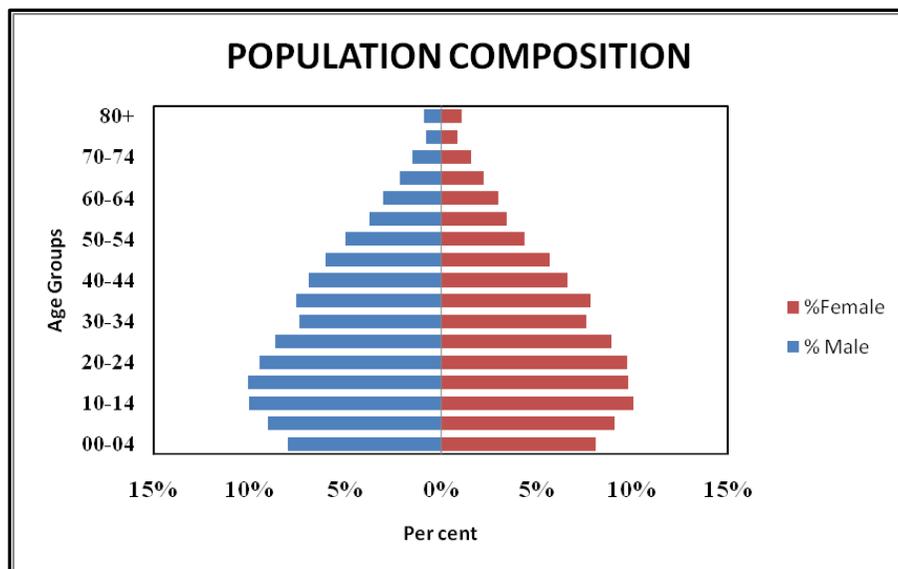
within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males.

THE POPULATION PYRAMID:-

Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

Population Composition- Data West Bengal (2011)

Age Group	Male	Female	Total	% Male	%Female
00-04	3743862	3589281	7333143	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%
65-69	991280	991713	1982993	-2%	2%
70-74	686881	703726	1390607	-1%	2%
75-79	360216	379551	739767	-1%	1%
80+	406536	477025	445803	-1%	1%
Total	46745275	44418389	90725906	-100%	100%



This pyramid has larger population in lower age group due to high birth rate. Expanding population pyramid depict population that have a larger percentage of people in younger age group. Population with this shape usually has high fertility rates with lower life expectancies.

Occupational Structure

The working population takes place in various occupations ranging from agriculture, forestry, fishing, manufacturing, construction, commercial transport, services, communication and other unclassified services. Agriculture, forestry, fishing and mining are classified as primary activities, manufacturing as secondary, transport, communication and other services as tertiary and the jobs related to research and developing ideas as quaternary activities. The proportion of working population engaged in these four sectors is a good indicator of the levels of economic development of a nation. A developed economy with industries can accommodate more workers in the secondary, tertiary and quaternary sector. If the economy is in primitive stages, then the proportion of people engaged in primary activities would be high.

INTRODUCTION:-

- The term '**occupation**' itself is **indefinite** as to both meaning and scope. It has a varying intellectual content and emotional association. In all modern languages, it has a **number of synonyms** and the **range of meanings**.
- The meaning of '**occupation**' has **undergone continuous changes** from the times immemorial. So, its contents can be fixed definitely only for a short period of time.
- Generally, an '**occupation**' of an individual refers to his trade, profession, type of work.
- Whereas '**structure**' is the arrangement of and relations between the parts or elements of something complex.
- Therefore, **occupational structure** refers to the division of its work force engaged in different economic activities

SIGNIFICANCE:-

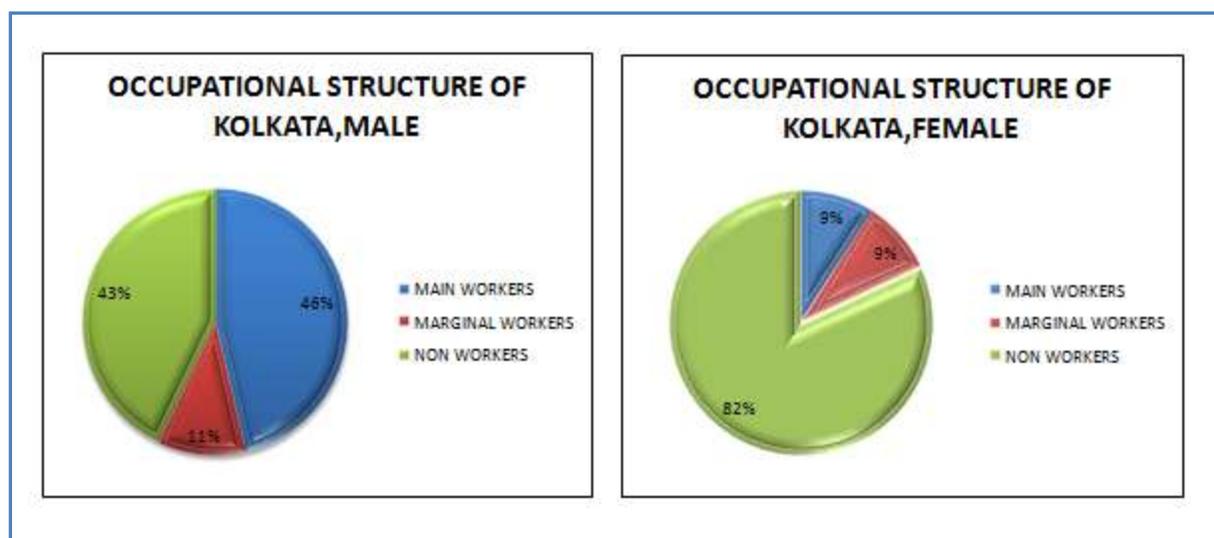
- It reflects the **close relationship between economic development and occupational structure**.
- It gives **proper illustration of ratio and spatial distribution of working and non-working population**.
 - This relevant data have its own **utility and role in policy making**
 - The proportion of workers engaged in various occupation **highlights economic and cultural development**.
- The significance of occupational distribution of population of a region lies in the fact that, it clearly reveals the **socio-economic characteristics of the people** living that particular region. It is, hence, one of the important measures of socio-economic development of the country.

ECONOMIC COMPOSITION:-

- Economic composition **unfolds the diverse economic, demographic and cultural attributes** of an area, which form the basis for region's social and economic development.
- However, the study of economic composition is **handicapped by serious data gaps**.
- Because **not** all the countries conduct their censuses **regularly**. Moreover, not all the countries that conduct their censuses collect the complete labour force data. Many countries, for example, restrict their statistical information to the size their work force and omit its distribution into various industrial or occupational categories.
- Furthermore, different countries may use different definitions and this **lack of uniformity** makes international **comparisons difficult**.
- The **census organizations** constitute the **chief source of data**.
- However, the recent efforts of the **United Nations** in the direction of the **standardization of various concepts** need to be appreciated. Apart from the census operations such sources like **household surveys** have also been utilized in advanced countries to collect specialized information pertaining to economic composition of a population. Such surveys are often resorted to for micro-level analysis.

OCCUPATIONAL STRUCTURE OF KOLKATA (WEST BENGAL, CENSUS 2011)			
WORKERS AND NONWORKERS			
	MALE	FEMALE	TOTAL
MAIN WORKERS	21678279	4008351	25686630
MARGINAL WORKERS	5037768	4031957	9069725
NON WORKERS	20092980	36426780	56519760

OCCUPATIONAL STRUCTURE OF KOLKATA (WEST BENGAL, CENSUS 2011)

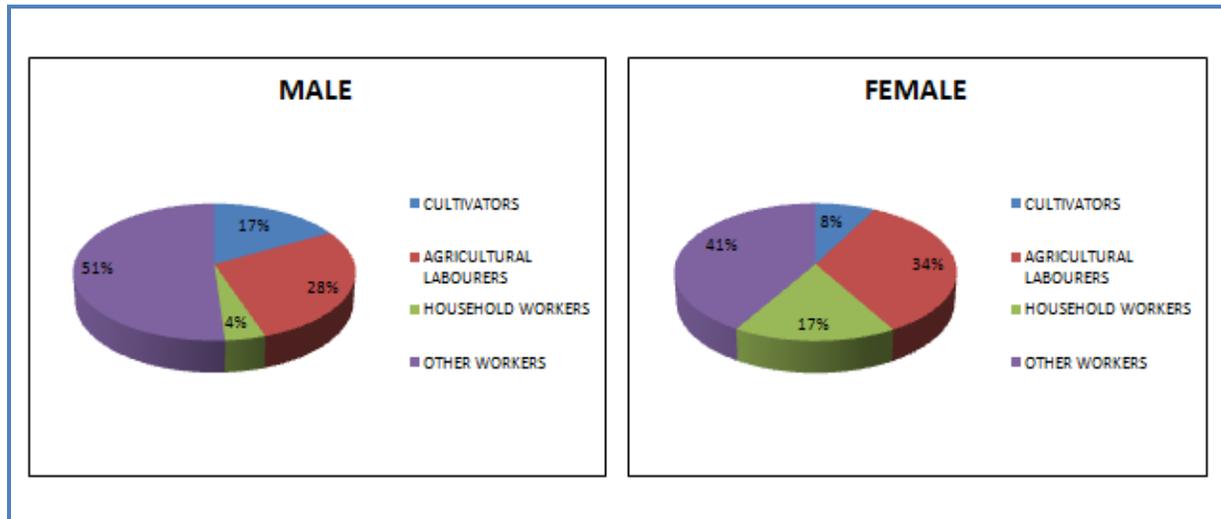


Interpretation:-

Pie diagram represent the occupational structure of Kolkata, 2011. Through this data table we can see that, total number of male workers are more high than the total number of female worker. But the same time the number of non worker males (20092980) are less than non worker females (36426780). It's seems that the participation of female in working profession is lower than male in Kolkata still now. Where The percentage of male as a main worker is 46% but at the same time it is only 9% in female.

CATEGORY OF WORKERS (MAIN & MARGINAL) (WEST BENGAL , CENSUS 2011)			
	MALE	FEMALE	TOTAL
CULTIVATORS	4500041	616647	5116688
AGRICULTURAL LABOURERS	7452814	2736028	10122842
HOUSEHOLD WORKERS	1114683	1349441	2464124
OTHER WORKERS	13648509	3338192	16986701

CATEGORY OF WORKERS (MAIN & MARGINAL) (WEST BENGAL, CENSUS 2011)



Interpretation:-

Pie diagram shows that category wise male-female workers in various field, on west Bengal, 2011. Through this diagram we can easily understand that – a huge number of people are engaged as a agricultural labourers (male= 28%, female= 34%) in West Bengal. 17% females are engaged as a household worker. After analysis the data and the diagram we can say that- in west Bengal the participation of male-female workers are mainly involved at agricultural field.

Occupational distribution of population in North East India

INTRODUCTION:-

The economic composition clarifies the miscellaneous economic, demographic and cultural attributes of an area, which form the basis for region's social and economic development. Among all the social attributes of population, work structure or occupational structure is of paramount importance, since it provides an index to many personal, social and demographic characteristics. Occupation and its role in society has always been the subject of considerable public commentary and debate.

The occupational structure of an economy plays a vital role in the overall economic scenario of the economy. The number of workers employed in different sectors of the economy is crucial to determine the level of development of the economy.

The economy of India's North East Region consists of 8 states is being holding an important place in Indian economy. However the region is still industrially backward despite of huge potentials and is mostly predominated by agricultural activities. The occupational distribution of the population in the region is also the same as its economic scenario. In this seminar paper we have described and analyzed the pattern of

occupational distribution of the population of the north east region of India with some objectives mentioned below .from our study we have found some important findings and we have suggest some policy measures on the basis of our study.

North East Region of India: An Overview

The 8 states in the north eastern region of India namely Arunachal Pradesh, Assam ,Manipur, Mizoram, Meghalaya, Nagaland, Tripura and Sikkim are together called North East India .It is mostly consist of hilly regions; it has plains on both sides of the river Brahmaputra and the Himalayan range around it. The flora and fauna of this region is numerous and varied.

The region accounts for 7.9% of the total land space of the country. Hill ranges forming part of the Himalayas guard the northern side of the region. The area is made up of mountains above the snow line and plains a little higher than sea level.

The region is of strategic importance for the country on account of the fact that nearly 90% of its borders form India's international boundaries.

Topography: About 70% of the region is hilly, and the topography varies within each state. Mountains and hills cover most of Arunachal Pradesh, Mizoram, Nagaland, Meghalaya, Sikkim and about half of Tripura, one-fifth of Assam and nine-tenth of Manipur.

The plains of the region are mainly made up of separate land masses - the Brahmaputra Valley and the Barak Valley in Assam and the Tripura plains in the South. In Manipur, the valley is small, comprising only about 10% of the total area of the state.

The Brahmaputra Valley stretches longitudinally for about 730 km, from North Lakhimpur to Dhubri district in Assam. The Barak Valley, formed by the river Barak and its tributaries covers the districts of Cachar, Karimganj and Hailakandi of South Assam. The Tripura plain is an extension of the Ganga-Brahmaputra plain.

INDUSTRIAL COMPOSITION, NORTH-EAST INDIAN STATES , 2001				
STATES/UNION TERRITORY	CULTIVATORS	AGRICULTURAL LABOURERS	HOUSEHOLD INDUSTRY	OTHERS WORKERS
ASSAM	39.1	13.2	3.6	44
MEGHALAYA	48.1	17.7	2.2	32
MANIPUR	40.2	12	10.3	37.6
MIZORAM	54.9	5.7	1.5	37.9
NAGALAND	64.7	3.6	2.6	29
TRIPURA	27	23.8	3	46.1
ARUNACHAL PRADESH	57.8	3.9	1.3	37
SIKKIM	49.9	6.5	1.6	42

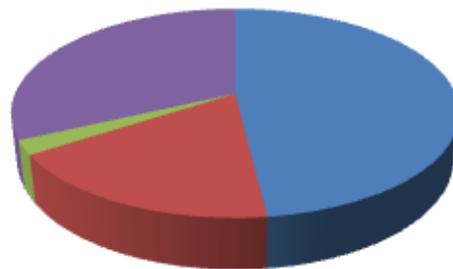
INDUSTRIAL COMPOSITION, NORTH INDIAN STATES, 2001

ASSAM



■ CULTIVATORS ■ AGRICULTURAL LABOURERS
■ HOUSEHOLD INDUSTRY ■ OTHERS WORKERS

MEGHALAYA



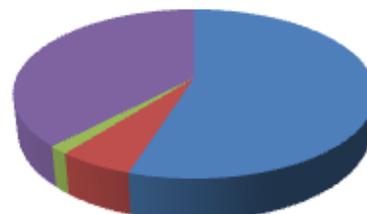
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MANIPUR



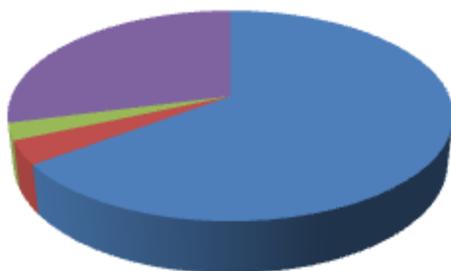
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■ HOUSEHOLD INDUSTRY ■ OTHERS WORKERS

MIZORAM



■ CULTIVATORS ■ AGRICULTURAL LABOURERS
■ HOUSEHOLD INDUSTRY ■ OTHERS WORKERS

NAGALAND



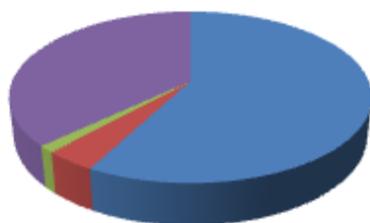
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TRIPURA



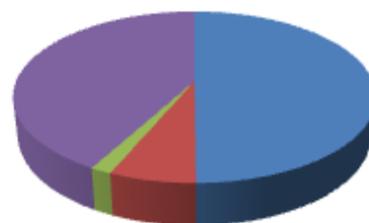
■ CULTIVATORS ■ AGRICULTURAL LABOURERS
■ HOUSEHOLD INDUSTRY ■ OTHERS WORKERS

ARUNACHAL PRADESH



■ CULTIVATORS ■ AGRICULTURAL LABOURERS
■ HOUSEHOLD INDUSTRY ■ OTHERS WORKERS

SIKKIM



■ CULTIVATORS ■ AGRICULTURAL LABOURERS
■ HOUSEHOLD INDUSTRY ■ OTHERS WORKERS

Interpretation:-

Pie graph and data table shows the industrial composition, North-East Indian states, 2001. Through this diagram we can easily analyse the occupational structure of those states. It shows that the percentage of cultivators is highest in Nagaland (64.7%). But at the same time the percentage of cultivators is lowest in Tripura (27%). In the state of Tripura the percentage of agricultural labourers (23.8%) is too much higher than the other states. It means a huge number of people are involved as agricultural labourers. It indicates that the number of own land ownerships are not too much in these states. The involvement in the household industry is better positioned in the state of Manipur (10.3%) among the other states in North-East India. It indicates that handicrafts industries are started to develop in Manipur. But at the same time the involvement in the household industry in other states like Mizoram, Arunachal Pradesh, Sikkim are not satisfactory.

Conclusion:

The scenario of occupational structure in the north eastern region of India is not very impressive. The rate of growth of work force participation is low in the region. Though the relationship between the agriculture and the manufacturing sectors is disappearing and the tertiary sector has emerged significantly even before the economy became highly industrialized is noted in Indian context, however the north east region is lagged far behind the pace. The NER region is still dominated by the agricultural sector and most of the workers belong to the primary sector. Deliberate actions should be taken in order to restructure the economic scenario of the region. The industrial backwardness situation should be eliminated by taking special industrial policies for the region. The north eastern council AND ministry of DONER are doing good in the region but its activities have not reached the remote areas of the region yet. Central government, state governments, private entrepreneurs and other stakeholders should act co-operatively and deliberately to develop the region so that the occupational structure gets a push to restructure itself.

Dependency Ratio

The dependency ratio is an age-population ratio of those typically not in the labor force (the *dependent* part ages 0 to 14 and 65+) and those typically in the labor force (the *productive* part ages 15 to 64). It is used to measure the pressure on the productive population.

Dependency Ratio-Formula:-

Formula [edit]

In published international statistics, the dependent part usually includes those under the age of 15 and over the age of 64. The productive part makes up the population in between, ages 15 – 64. It is normally expressed as a percentage:

$$\text{(Total) Dependency ratio} = \frac{(\text{number of people aged 0 to 14}) + (\text{number of people aged 65 and over})}{\text{number of people aged 15 to 64}} \times 100$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. This results in direct impacts on financial expenditures on things like social security, as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and the aged dependency ratio:^[5]

$$\text{Child dependency ratio} = \frac{\text{number of people aged 0 to 14}}{\text{number of people aged 15 to 64}} \times 100$$

$$\text{Aged dependency ratio} = \frac{\text{number of people aged 65 and over}}{\text{number of people aged 15 to 64}} \times 100^{[6]}$$

Population Composition- Data West Bengal (2011)

Age Group	Male	Female	Total
00-04	3,743,862	3,589,281	7333143
05-09	4,216,763	4,031,046	8247809
10-14	4,677,506	4,479,017	9156523
15-19	4,702,325	4,355,706	9058031
20-24	4,422,630	4,335,692	8758322
25-29	4,044,904	3,953,005	7997909
30-34	3,464,659	3,376,931	6841590
35-39	3,523,361	3,489,285	7012646
40-44	3,219,604	2,933,456	6153060
45-49	2,814,212	2,521,507	5335719
50-54	2,317,232	1,940,648	4257880
55-59	1,746,903	1,521,747	3268650
60-64	1,406,401	1,339,053	2745454
65-69	991,280	991,713	1982993
70-74	686,881	703,726	1390607
75-79	360,216	379,551	739767
80+	406,536	477,025	445803
Total	46,745,275	44,418,389	90725906

Here, total number of people aged 0 to 14 is = **24737475**

Total number of people aged 65 and over is = **4559170**

And total number of people aged 15 to 64 is = **61429261**

Dependency Ratio:-

$$= \frac{(24737475 + 4559170) \times 100}{61429261}$$

$$= 47.69168$$

Interpretation:-

From this table we can say that the dependency ratio of west Bengal is show that – it is not too good. It's mean total number of working population is not too high. Here the table shows that the total number of young aged population (aged 0 to 14) is 24737475 and total number of old aged population (aged 65 and over) is 4559170. The dependency ratio of west Bengal is 47.69168%

A high dependency ratio can cause serious problems for a country if a large proportion of a government's expenditure is on health, social security & education, which are most used by the youngest and the oldest in a population. The fewer people of working age, the fewer the people who can support [schools](#), retirement [pensions](#), [disability pensions](#) and other assistances to the youngest and oldest members of a population, often considered the most [vulnerable](#) members of [society](#).

Nevertheless, the dependency ratio ignores the fact that the 65+ are not necessarily dependent (an increasing proportion of them are working) and that many of those of 'working age' are actually not working. Alternatives have been developed, such as the 'economic dependency ratio', but they still ignore factors such as increases in productivity and in working hours. Worries about the increasing (demographic) dependency ratio should thus be taken with caution.

High dependency ratios can also lead to long-term economic changes within the population such as saving rates, investment rates, the housing markets, and the consumption patterns. Typically, workers will start to increase their savings as they grow closer to retirement age, but this will eventually affect their long-term interest rates due to the retirement population increasing and the fertility rates decreasing. If the demographic population continues to follow this trend, their savings will decrease while their long-term interest rates increase. Due to the saving rates decreasing, the investment rate will prevent economic growth because there will be less funding for investment projects. There is a correlation between labor force and housing markets, so when there is a high age-dependency ratio in a country, the investments in housing markets will decrease since the labor force is decreasing due to a high dependency population.

Measurement of Net Internal Migration

Regardless of whether direct questions on migration have been asked in the census, it is possible to estimate net inter censal migration on the basis of census counts of the population of component areas at two successive censuses along with some additional information that is normally available from the censuses or from other sources.

The population increment between any two dates for any given geographic area is the result of natural increase (births minus deaths) and net migratory movement. If the country is a closed one as far as population growth is concerned, i.e., if there has been virtually no migration between the given country and other countries, then the net migratory movement for a given geographic area must be the result of internal migration, i.e., in-migration minus out-migration. Where the population is not closed, problems arise in measuring the effects of internal migration. These are dealt with in the discussion of specific techniques.

Given the population of an area at two points in time and an estimate of natural increase during the interval, we can calculate the number that would be expected at the end of the interval in the absence of migration. The difference between the observed and expected numbers at the end of the interval, or the difference between the observed and the expected change, gives an estimate of" net change due to migration.

Approaches to estimating the expected population or the expected change are of two types: (a) through vital statistics and (b) through the use of estimates of the probability of survival. Applications of these approaches are discussed below.

VITAL STATISTICS METHOD (VS)

Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put in the following simple form:

$$\text{Net } M = (P_{t+n}) - P_t - (B - D)$$

where for any given area M = net migration, P_t is the population at the earlier census, P_{t+n} is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to residents of the area during the same period.

An application of the formula is given:-

ESTIMATES OF NET MIGRATION TO MADRAS CITY BY THE VITAL STATISTICS METHOD, 1951-1961

1. Population of Madras, 1951 = $P_t = 1,416,056$
2. Population of Madras, 1961 = $P_{t+1} = 1,729,141$
3. Increase in population, 1951-1961 = (2) - (1) = 313,085
4. Number of births in Madras, 1951-1961 = $B = 653,190$
5. Number of deaths in Madras, 1951-1961 = $D = 371,286$
6. Natural increase in Madras, 1951-1961 = (4) - (5) = 281,904
7. Net migration to Madras, 1951-1961 = (3)-(6) = 31,181

This method can, of course, be applied not only to the total population of the area but to particular segments of the population with characteristics which do not change (sex): or for which the change over time is determinable (age).

3.3 APPLICATION OF GIS RS &

-:Land Use Mapping:-

City planners need to know which areas of a city are used for which purpose. Therefore, they produce a map of "land use", that identifies parts of a city and the major activities (land use) that happen there. Remote sensing imagery is very useful for this purpose, since you certainly don't want to spend many weeks or months walking or driving around a city to map its land use. But to use remote sensing imagery effectively, you have to be able to interpret it accurately.

The satellite image in this activity shows a part of downtown Montreal. It will be a bit harder to interpret this black and white image, because you don't have colour clues to rely on. But you can see quite a bit of spatial detail - even individual streets and large buildings.

Measuring land use function:- Along each of the transects use a systematic sampling strategy to select locations to record land use function. You may wish to restrict your sample as follows:

- recording land use every 10m
- recording ground floor land use only
- recording land use on a single side of the road

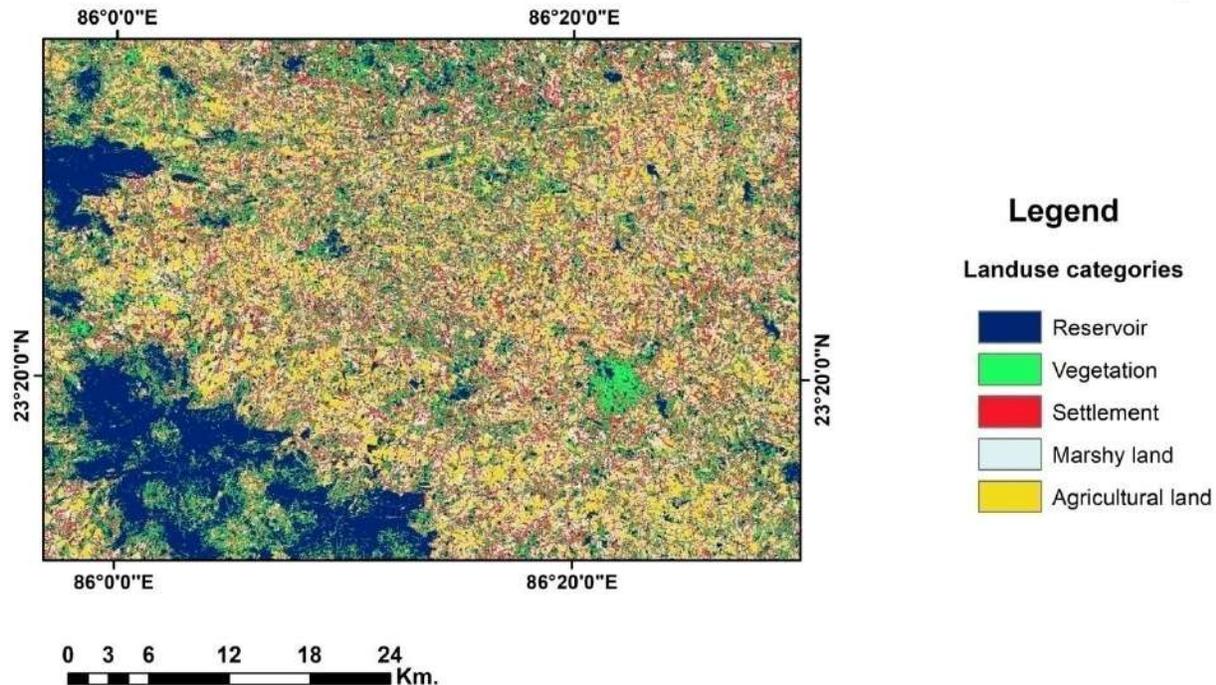
Land use is categorised for ease of analysis. A popular way of doing this is to use the RICEPOTS system.

Code	Type of Land Use	Further information – extra letters
R	Residential	f = flat, t = terraced house, s= semi-detached house, b = bungalow, d= detached house
I	Industrial	l = light manufacturing, h= heavy industry, c = chemical, e = extraction/mining
C	Commercial	f = food, t = take-away, p = personal services, d = department stores, h=homeware & furniture, g = garage, m = market, s = specialist shop, o = office, v = vacant
E	Entertainment	h = hotel, s = sports centre, g = gym, t = theatre or cinema, b = bar, r = restaurant or café
P	Public building	e = education, l = library, h = hospital, c = place of worship, p = police station, a = ambulance station, f = fire station, w = welfare
O	Open space	f = farmland, p = park, c = cemetery, u = unused land, d = derelict building, s = sports field
T	Transport	B = bus station, t = taxi rank, c = car park, r = railway station
S	Services	f = financial, b = business, m = medical, e = estate agents, d = dental

Further letters can be added as required, or add o = other.

Please note that there are quite a lot of variations on this theme. Students could be challenged to identify a more appropriate index, or to develop their own.

Preparation of a simple landuse map



Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation:- optimal utilization of land resource is essential for sustainable development. Land use describes how a parcel of land is used such as for agriculture, settlements or industry, whereas land cover refers to the material such as vegetation, rocks or water bodies that are present on the earth surface. The water bodies include river, canal, tank, pond and reservoir etc. GIS and remote sensing techniques are effective tool in land use and land cover mapping. Proper planning of the land resource is required to meet the needs of the ever increasing population.

This satellite images actually shows the western part of West Bengal, India. We all know that this region is a part of Chottonagpur plateaus.

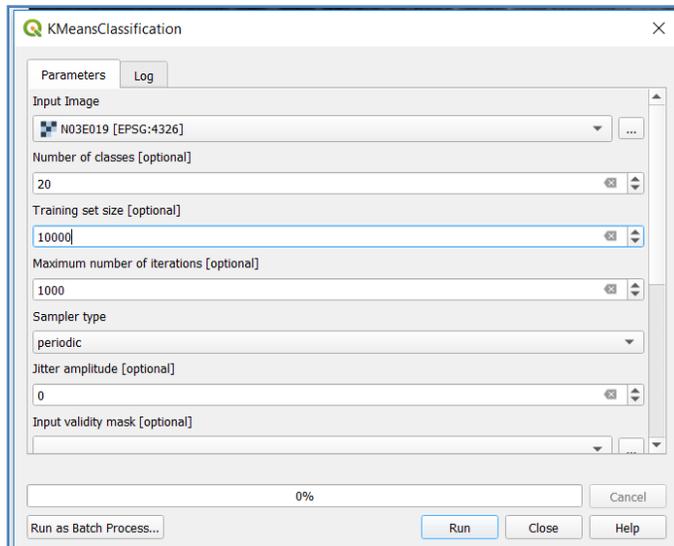
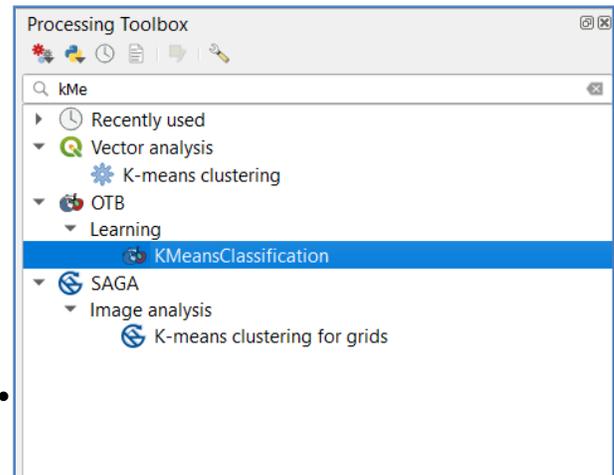
In this land use map- the settlement area is covered [4.349640602 sq.km](#), reservoir covered [15.32752959 sq. Km](#), vegetation is [20.93748715 sq.km](#), marshy land is [24.93563516 sq.km](#) and agricultural land covered [34.4497075 sq.km](#).

Through this satellite images and use of our basic knowledge about this area- we can easily say that the density of settlement area particularly in this area is marginally lower than the other parts of West Bengal as well as India. But at the same time it seems that the natural vegetation covered area is much better than the other parts of West Bengal as well as India. Marshy land covered all most 25% area, which is a good sources of agriculture water in the summer season. And it also used for various water power grid supply in this area. These marshy lands also a good source of local food supply and many local people depend on it.

Unsupervised classification using KMeans Classification in QGIS

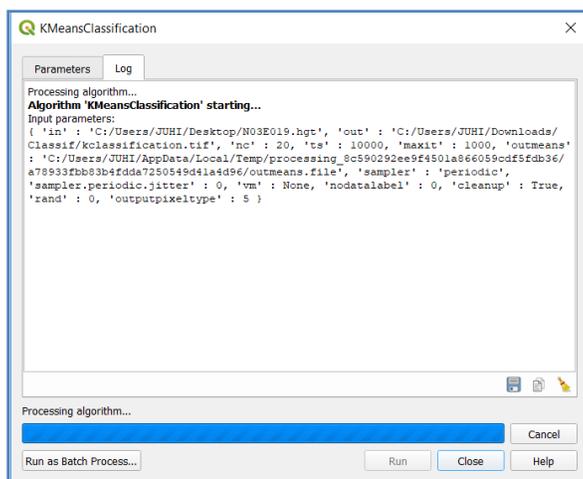
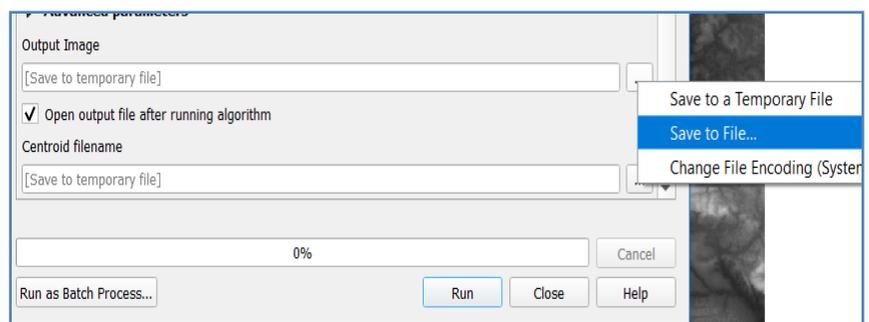
- Add a raster layer in a project **Layer >> Add Layer >> Add Raster Layer**.

- Go to the search box of Processing Toolbox , search **KMeans** and select the **KMeansClassification**.



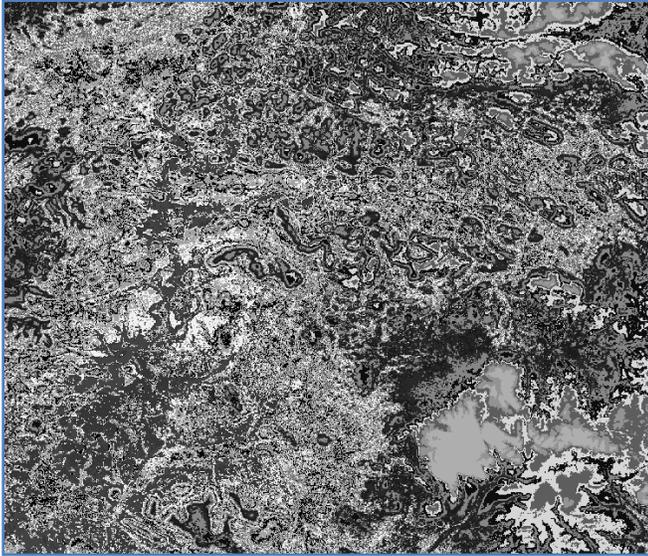
- Select the input image. Type the Number of classes to 20 (default classes are 5) . Fill training size to 10000.

- Type the name of output image save to file.



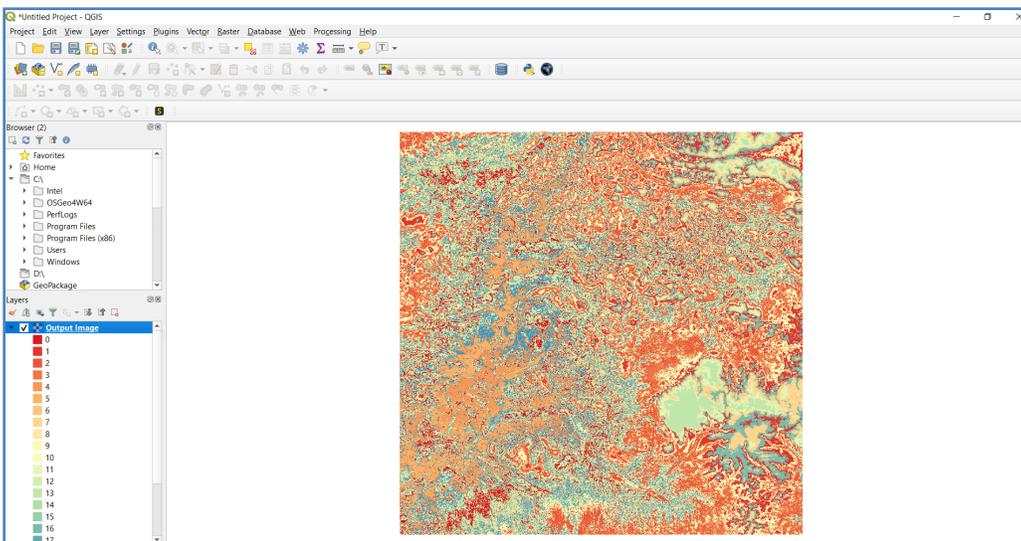
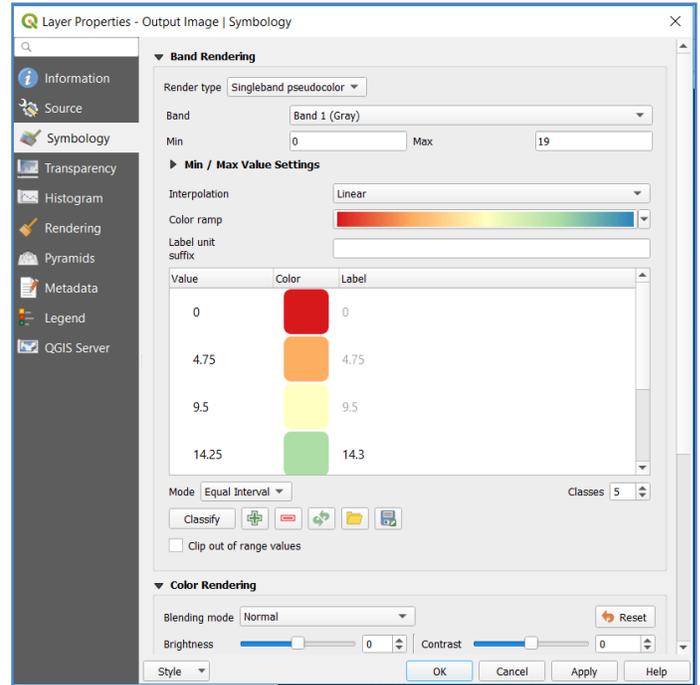
- And in the last tap on **Run**

- Output image directly display on canvas. Image is shown below.



In the layer panel, right click on the output layer and select **Properties >> Symbology**. Change Render Type **Singleband Pseudocolor**.

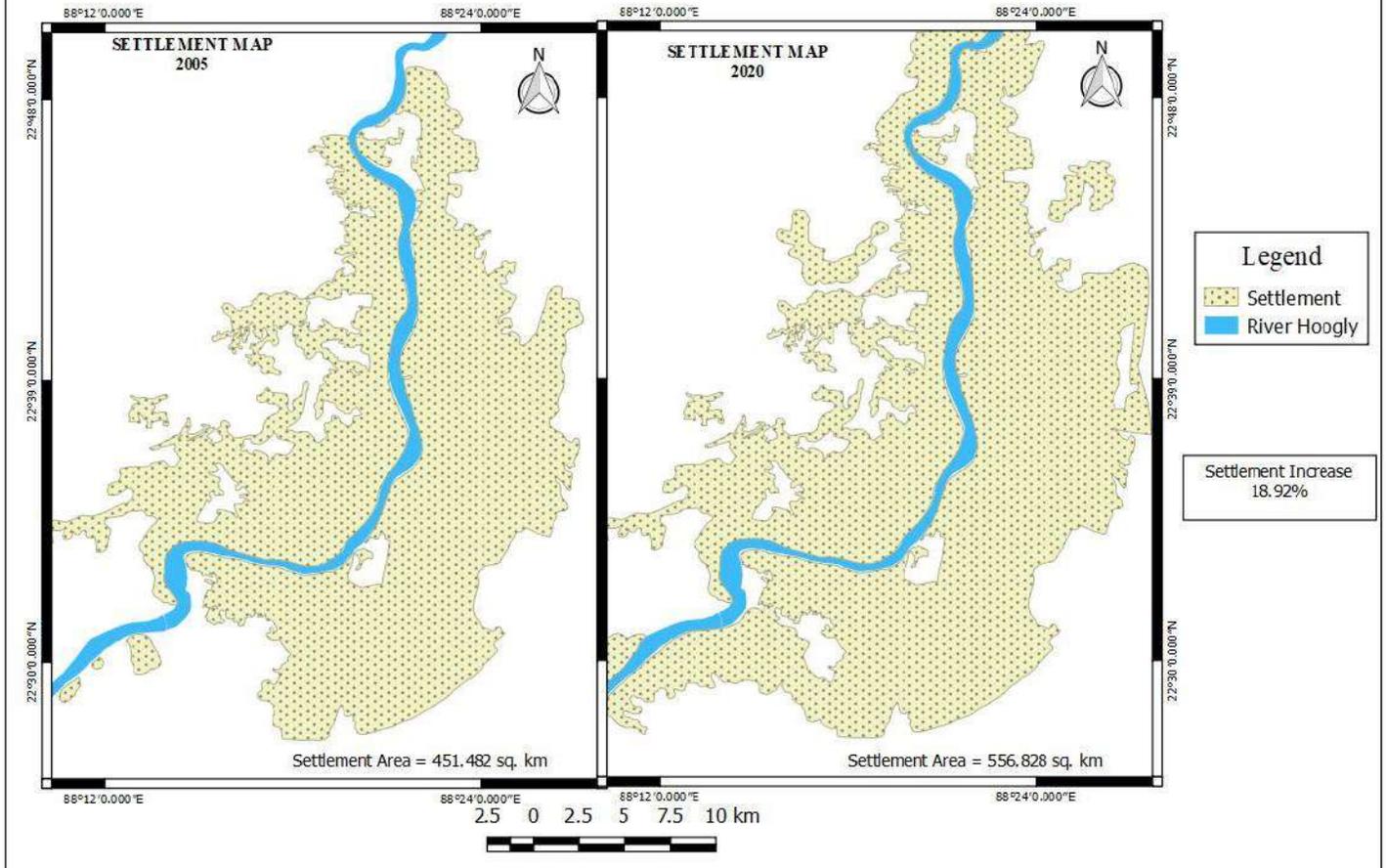
- Select the **Color Ramp** (we selected spectral)
- Choose Mode **Equal Interval** (default selection is continous)
- Change the number of **classes** from 5 to **20**.



- In the last click on **OK**. Output image is provided below. You can also classify according to discrete interpolation if desired.

This is all about unsupervised classification using KMeans Classification. If you face any problem in implementing then please do comment.

Habitat Change Identification on The Banks of River Hoogly (2005-2020)



Interpretation:- through this map we try to present- how the changes of settlement in beside the bank of Hooghly river since 2005-2020. Here we can see that in the year 2005 the number of settlements were lesser than the 2020. In 2005 the settlement covered area was 451.482 sq.km and in2020 it was 556.828 sq.km. The rate of settlement increase is 18.92%. its shows the density of settlement is increasing rapidly in this region. It also indicated the decreasing of natural vegetation covered area in this region.

3.4 SPATIAL PLAN FORMULATION AND LAYOUT FOR A GRAM PANCHAYAT BY USING GIS & RS

What is spatial planning?

Spatial planning is mostly recognized as a public sector function with the purpose of influencing future spatial distribution of activities. The aim is to create a more rational territorial organization of land use and the linkages between them, to balance demands for development with the need to protect the environment, and to achieve social and economic objectives (Wegener, 1998). Spatial planning tries to coordinate and improve the impacts of other sectoral policies on land use, in order to achieve a more even distribution of economic development within a given territory than would otherwise be created by market forces. Spatial planning is, therefore, an important function for promoting sustainable development and improving quality of life. To establish systematic spatial planning in collaboration with local stakeholders, a spatial planning methodology called Geodesign has been widely used around the world (e.g., Steinitz, 2012; Li and Milburn, 2016; Hollstein, 2019).

Policy Approaches: Corridors and Axes in Spatial Planning and Urban and Regional Policy Documents

Corridors are recognized in spatial planning and regional policy documents (drawn up by individual countries or by groups of countries), in which they are seen as an element of balanced and integrated regional (and transnational) development within different spatial policy contexts. Accordingly, four normative categories can be defined:

1. The corridor as an instrument of economic development policy;
2. The corridor as an instrument of (transnational) spatial development policy;
3. The corridor as an instrument of transportation policy; and
4. The corridor as an instrument of ecological (or environmental) policy.

Although policy documents quite often refer to corridor and axis development, it seems to be a big step to move from the analytical framework to the implementation of policy. Moreover, the cross-border developments—such as transnational transportation corridors, mega corridors, polycentric developments, ecological corridors, etc.—that require cross-border cooperation require new governance approaches and regulations to deal with these types of development. In Europe, recent attempts to establish a more loosely organized structure in the Delta Metropolis provide an initial example of the establishment of such governance institutions. The spatial development policy of the European Union (EU) gives special attention to a variety of corridor developments that are defined analytically above.

The Corridor as an Instrument of Economic Development policy:-

Individual countries define specific spatial strategies at different scales, ranging from the micro- to the macroscales (urban, regional, and national), where interregional transportation networks, regional-spatial development corridors, or inner city functional corridors make sense. The Multimedia Super Corridor (MSC) of Malaysia and Guangzhou China are good examples of these.

The MSC (Malaysia), a 50-km-long high-tech industry zone stretching southward from Kuala Lumpur, offers a 15-km-wide concentration of global information and communication technology (ICT) industries. Started in 1996, the MSC Malaysia has become a dynamic ICT hub, hosting more than 900 multinationals and foreign and

domestic companies focused on multimedia and communications products, solutions, services, and research and development.

South China's Guangdong Province, one of the most developed areas in the country, built an information industrial corridor in the Pearl River Delta during the period 2001–05. The corridor focuses on information technology, which was selected as a pacesetter and priority industry, with Shenzhen and Guangzhou cities as leaders. The provincial capital of Guangzhou will stress software development; Shenzhen, a special economic zone, will prioritize high technology; and Dongguan will endeavor to build itself into the world's largest computer production center.

The Corridor as an Instrument of (Transnational) Spatial Development policy:-

Policy documents on cross-border cooperation also define corridor development at the macrolevel. In the EU, for instance, the tendency is to implement an indicative spatial development perspective, where individual countries are invited to contribute to the organization and development of transnational (spatial, infrastructural, etc.) networks. For instance, European Spatial Development Perspective (ESDP) is an organized and integrated spatial policy at a transnational level. In contrast, the United States has almost no strategy to anticipate and manage comparable concerns throughout the country. Recent academic research (carried out by the Lincoln Institute, New York), however, aims to define conditions for an American spatial development policy. This policy would define the megalopolis as a model for cooperation among the cities and regions in the United States that are currently growing together and creating diseconomies within a matrix of congested transportation networks, thus creating a new urban form; however, at the policy level this project has not yet been realized.

The development of a balanced and polycentric urban system and a new urban–rural relationship is one of the targets of the territorial development strategy of the ESDP, which defines the corridor concept as a tool to reconcile economic growth, competitiveness, and sustainable development. ESDP offers a geographical image of the European economic space—a polycentric urban system, linked by integrated communication corridors, and separated by protected environmental and water catchments. Pan-European or Euro-corridors, for instance, are defined by the ESDP.

The Corridor as an Instrument of Transport Policy:-

The transport connections between important economic regions (megaurban regions) define the corridors as transport axes. The trans-European networks (TENs), for instance, are part of a wider system, including a telecommunications network and a proposed energy network. In addition to the various trans-European networks, there are ten pan-European corridors, which are paths between major urban centers and ports. In order to create a dense network of feasible transport infrastructure throughout Europe, the European Commission contributes to the organization and development of TENs in the areas of transport, telecommunications, and energy-supply infrastructure. TEN is a European-scale program that will interconnect the national transport infrastructures to create a genuine TEN.

In this context, railway networks offer important potential for easing traffic on major trans-European roads and for connecting urban regions. The five railway axes within the EU are intended to define the transport priorities: the Paris–Bratislava axis, which will improve connections with the new member states; the Lyon–Budapest axis, also called the East–West corridor, south of the Alps; the high-speed southwest Europe axis, connecting France to the Iberian Peninsula; the Berlin–Palermo axis, also called the North–South corridor, of Central Europe; and Rail Baltica, which will connect Helsinki to Warsaw via the Baltic states. Within this framework, the economic, social, and spatial consequences of major rapid railway connections between Amsterdam, Brussels, Paris and Dortmund (Thalys); and London, Lille, Brussels, Paris, Avignon and Bourg St Maurice (Eurostar) in terms of creating transnational corridors, as well as the impact of new political economic developments (like Brexit) on these high-speed corridors is yet unclear.

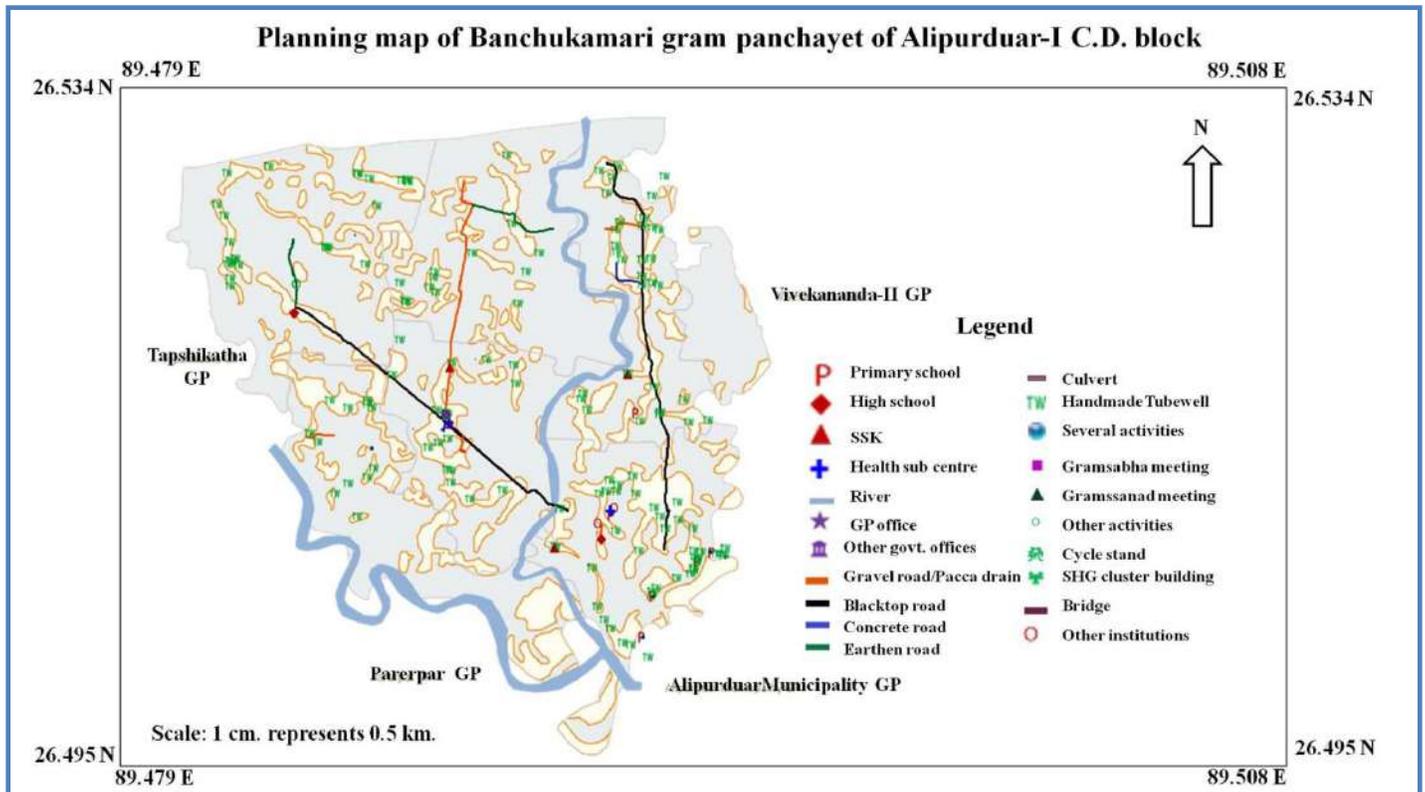
The Corridor as an Instrument of Ecological (or Environmental) Policy:-

Ecological corridors are usually seen as important elements of planning policy at several scale levels. In Europe, for instance, several organizational bodies and institutions have been established for protecting and managing ecological corridors. For instance, the Pan-European Ecological Network aims to ensure appropriate interconnectivity between the selected core (green) areas that provide the optimum achievable quantity and quality of environmental space at the transborder scale. Here, the corridors are instruments to ensure that species populations have adequate opportunities for dispersal, migration, and genetic exchange. Adopted by the Council for the Pan-European Biological and Landscape Diversity Strategy in 1999, the guidelines for the development of this ecological network take the form of a reference document for use by actors, including policymakers, parliamentarians, natural resource managers, spatial planners, researchers, the academic community, representative organizations, private enterprises, and members of nongovernmental organizations. Within this framework, several trans border initiatives have been taken and pilot projects have been implemented, such as the Trans border Cooperation between Estonia and Latvia on Trans border Ecological Network Development and Water Resource Management; the Development of the Trans boundary East European Model for the Polesie: the Belarus–Ukraine–Poland Regional Ecological Network; and the cross-border ecological network of the Białowieża Forest Region (between Poland and Belarus). In these initiatives, not only have ecological corridors been defined as instruments for protecting certain green areas, but cross-border policy exercises between various countries have been implemented.

Spatial planning system



SPATIAL PLAN FORMULATION AND LAYOUT FOR A GRAM PANCHAYAT BY USING GIS & RS



Interpretation:- In This Map We Try To Show A Proper Planning Mapping Of Banchukamari Gram Panchayet Of Alipurduar-I C.D Block. Here We Can See That Lots Of Government Administrative Institutions Are Situated. 5 Primary Schools, 2 High School, 3 SSK And 2 Health Sub Centre Are Here. We Can Easily Says That From This Map That The Water Supply Of This Pnachayet Area Is Very Good, Because Lots Of Handmade Tubewells Are There.

**BHAIRAB GANGULY COLLEGE
(WEST BENGAL STATE UNIVERSITY)
(PG SEM-IV, LAB NOTEBOOK)**

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SEM – IV

**PAPER – REGIONAL PLANNING AND RURAL
DEVELOPMENT PRACTICAL**

PAPER CODE – GEOPDSE04P

UNIT 1: RURAL RESEARCH METHOD AND METHODOLOGY

1.1 PRE-FIELD ISSUES ON RURAL RESEARCH

Contemporary research trends:-

Research Trends is an online publication providing objectives insights into scientific trends based on bibliometrics analyses. Worldwide, there is a growing demand for quality research performance measurement and trend-related information by deans, faculty heads, researchers, funding bodies and ranking agencies.

The author of this article highlights the exploration for contemporary research trends within technology management. Thereby, this paper primarily focuses on investigating research areas and issues connected with technology management in contemporary scientific publications selected from the Web of Science database. The results of the undertaken overview of the selected literature lead to a visualization of issues most frequently occurring in configuration with technology management, as well as the aspect of their coexistence in the analyzed compilation of literature. Along with the description of the conducted analysis, it constitutes a fundamental result of this work.

The main aim of the article is the identification and critical assessment of the most commonly used models and methods of measuring service quality. The last part of paper is dedicated to the overview of measurement issues taking into account the specific features of logistics service. The paper was based on the research method of systematic literature review and critical analysis of research achievements. The article includes: (i) definitions of service quality, (ii) identification of the most popular models of service quality, (iii) overview of measuring methods of service quality, and (iv) the main research achievements on account of logistics service quality. This article aims to identify the trends and dynamics of changes in city logistics on the basis of bibliometric data of international literature published in the ISI Web of Science, Scopus, Elsevier, Emerald and EBSCO host databases in recent years. The study made use of basic techniques of the bibliometric method with the support of the VOS viewer software. On the basis of a huge number of literary works, the analysis allowed for the assessment in terms of chronological development of research concerning city logistics and the identification of main authors, publications, and journals being of crucial significance to this area of research.

Literature search on research problem stated:-

Literature search is a key step in performing good authentic research. It helps in formulating a research question and planning the study. Various databases are available for performing literature search. This article primarily stresses on how to formulate a research question, the various types and sources for literature search, which will help make your search specific and time-saving. Literature search is a systematic and well-organized search from the already published data to identify a breadth of good quality references on a specific topic.

[1] The reasons for conducting literature search are numerous that include drawing information for making evidence-based guidelines, a step in the research method and as part of academic assessment.

[2] However, the main purpose of a thorough literature search is to formulate a research question by evaluating the available literature with an eye on gaps still amenable to further research.

[3] Research problem is typically a topic of interest and of some familiarity to the researcher. It needs to be channelised by focussing on information yet to be explored. Once we have narrowed down the problem, seeking and analysing existing literature may further straighten out the research approach.

[4] A research hypothesis is a carefully created testimony of how you expect the research to proceed. It is one of the most important tools which aids to answer the research question. It should be apt containing necessary components, and raise a question that can be tested and investigated.

The literature search can be exhaustive and time-consuming, but there are some simple steps which can help you plan and manage the process. The most important are formulating the research questions and planning for search.

A research problem, or phenomenon as it might be called in many forms of qualitative methodology, is the topic would you like to address, investigate, or study, whether descriptively or experimentally. It is the focus or reason for engaging in your research. It is typically a topic, phenomenon, challenge that you are interested in and with which you are at least somewhat familiar.

For example, when students encounter difficulties with word problems in math, teachers may initially think that students have not mastered the basic skills that would allow them to carry out the needed computations. However, the difficulty may actually lie in poor reading skill, which prevent the students from identifying the words in math problems. The students also might not understand or correctly interpret essential vocabulary.

Framing Research Question and Hypothesis:-

Framing a clear research question is a crucial part of developing your research proposal, and should be seen as emerging from a dialogue between a developing theoretical position and decisions you need to take about research design and subsequent data analysis.

Any empirical research—quantitative or qualitative—should be guided from the outset by a question or set of questions. The question defines precisely what is being examined and how an assessment of the results will be undertaken.

The research question begins with a research problem, an issue someone would like to know more about or a situation that needs to be changed or addressed, such as:

- Areas of concern
- Conditions that could be improved
- Difficulties that need to be eliminated
- Questions seeking answers

Characteristics of a good research question:

- The question is feasible.
- The question is clear.
- The question is significant.
- The question is ethical.

The feasibility of the question should guide not only the expression of the question but its conception. Feasibility should be foremost in the researcher's mind in the earliest stages of any project. Reviewers will always evaluate the feasibility of a question (possibly before other elements).

Clear expression signals clear thinking. Not only must the question be clear in the mind of the researcher, it must be articulated clearly. Again, reviewers of a manuscript will insist upon clear question so that the potential audience will be able to understand the question and, thus, follow the write-up of the project.

Significance may be said to be in the eye of the beholder. One way to gauge significance is to ascertain whether a reading audience will be able to take away a lesson from the project. Work that is very limited—say, to a single organization—may not be looked upon with favor by reviewers. If the question and the project are important enough that readers learn from the work, then it generally passes the significance test.

Research Questions and Research Hypotheses:

As will be discussed extensively in later Web Notes, research questions are formulated in conjunction with research hypotheses (also referred to as “conceptual hypotheses”). Importantly, researchers should formulate research questions and hypotheses at the same time; rarely if ever are research questions and research hypotheses done independently of each other. Indeed, the process presented in this class essentially requires that these two steps occur simultaneously. Research hypotheses serve a variety of purposes, however, most important at this stage of the research process is that research hypotheses help to “justify” whether a research question is sufficiently important to collect the data needed to answer it. If not, the question should be dropped. Another useful role of hypotheses is to help generate implied research questions. So although this topic is not covered just yet, bear in mind that research questions and research hypotheses work hand in hand and no discussion of research questions can be complete with incorporating research hypotheses into it.

Hypothesis:

Hypothesis is an assumption that is made on the basis of some evidence. This is the initial point of any investigation that translates the research questions into a prediction. It includes components like variables, population and the relation between the variables. A research hypothesis is a hypothesis that is used to test the relationship between two or more variables.

Sources of Hypothesis - Following are the sources of hypothesis:

- The resemblance between the phenomenon.
- Observations from past studies, present-day experiences and from the competitors.
- Scientific theories.
- General patterns that influence the thinking process of people.

Types of Hypothesis - There are six forms of hypothesis and they are:

- Simple hypothesis
- Complex hypothesis
- Directional hypothesis
- Non-directional hypothesis
- Null hypothesis
- Associative and casual hypothesis.

Examples of Hypothesis - Following are the examples of hypothesis based on their types:

- Consumption of sugary drinks every day leads to obesity is an example of a simple hypothesis.
- All lilies have the same number of petals is an example of a null hypothesis.
- If a person gets 7 hours of sleep, then he will feel less fatigue than if he sleeps less.

Functions of Hypothesis - Following are the functions performed by the hypothesis:

- Hypothesis helps in making an observation and experiments possible.
- It becomes the start point for the investigation.
- Hypothesis helps in verifying the observations.
- It helps in directing the inquiries in the right directions.

Selected study area and target population:-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work”. Ideally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

There are few areas in business studies that can offer interesting topics due to their dynamic nature. The following is the list of research areas and topics that can prove to be insightful in terms of assisting you to choose our own dissertation topic.

The target population is the group of individuals that the intervention intends to conduct research in and draw conclusions from. Target population is an informal term used mostly in epidemiology. It's general defined to mean a group or set of elements that you want to know more information about.

Most of the time, "target population" and "population" are synonymous. However, adding the word target emphasizes that sometimes we miss the mark in sampling, and don't always hit the mark: samples can be unrepresentative of the population that you originally intended to sample. For example, you might want to survey all the hospitalized adults in the United States (the target population), but budget constraints limit your survey to hospital patients just four cities in the U.S. The sampled population and targeted population in this scenario are likely to be quite different.

Target Population Units:

In some areas like regression analysis in epidemiology, it's especially important to identify the target population. While data analysis in the sciences always includes the correct units (e.g. was time measured in seconds, decades, or light years?), specific information about the population is left out.

Identifying and collecting relevant secondary data:-

Secondary data is one of the two main types of data, where the second type is the primary data. These 2 data types are very useful in research and statistics, but for the sake of this article, we will be restricting our scope to secondary data.

Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

A data classified as secondary for a particular research may be said to be primary for another research. This is the case when a data is being reused, making it a primary data for the first research and secondary data for the second research it is being used for.

Sources of Secondary Data:

Sources of secondary data includes books, personal sources, journal, newspaper, website, government record and many others. Secondary data are known to be readily available compared to that of primary data. It requires very little research and need for manpower to use these sources.

With the advent of electronic media and the internet, secondary data sources have become more easily accessible. Some of these sources are highlighted below.

Steps in Secondary Data Analysis:

Stepping Your Way through Effective Secondary Data Analysis

1. Determine your research question – As indicated above, knowing exactly what you are looking for.
2. Locating data– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.
3. Evaluating relevance of the data – Considering things like the data's original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. Assessing credibility of the data – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.

Preparing survey schedule and questionnaire:

A schedule is a structure of a set of questions on a given topic which are asked by the interviewer or investigator personally. The order of questions, the language of the questions and the arrangement of parts of the schedule are not changed. However, the investigator can explain the questions if the respondent faces any difficulty. It contains direct questions as well as questions in tabular form. Schedule include open-ended questions and close-ended questions. Open-ended questions allow the respondent considerable freedom in answering. However, questions are answered in details. Close-ended questions have to be answered by the respondent by choosing an answer from the set of answers given under a question just by ticking.

Following are the different types of schedules used by social scientists and anthropologists.

- ***Village or community schedule:*** It is used by census researchers who collect general information on populations, occupations, etc.
- ***Family or Household schedule:*** It gives full demographic details of households, the status of individuals, data on education, age, family relations, etc.

- **Opinion or attitude schedule:** To schedule the views of the population regarding an issue.

Questionnaire:

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. A research questionnaire is typically a mix of close-ended questions and open-ended questions. Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts.

The data collected from a data collection questionnaire can be both qualitative as well as quantitative in nature. A questionnaire may or may not be delivered in the form of a survey, but a survey always consists of a questionnaire.

Questionnaire Examples

The best way to understand how questionnaires work is to see the types of questionnaires available. Some examples of a questionnaire are:

Customer Satisfaction Questionnaire - This type of research can be used in any situation where there's an interaction between a customer and an organization. For example, you might send a customer satisfaction survey after someone eats at your restaurant. You can use the study to determine if your staff is offering excellent customer service and a positive overall experience.

Product Use Satisfaction Questionnaire - You can use this template to better understand your product's usage trends and similar products. This also allows you to collect customer preferences about the types of products they enjoy or want to see on the market.

Company Communications Evaluation Questionnaire - Unlike the other examples, a company communications evaluation looks at internal and external communications. It can be used to check if the policies of the organization are being enforced across the board, both with employees and clients.

Types of questions in a questionnaire

Using various question types can help increase responses to your research questionnaire as they tend to keep participants more engaged.

- **Open-Ended Questions** - Open-ended questions help collect qualitative data in a questionnaire where the respondent can answer in a free form with little to no restrictions.
- **Dichotomous Questions** - The dichotomous question is generally a "yes/no" close-ended question. This question is usually used in case of the need for necessary validation. It is the most natural form of a questionnaire.
- **Multiple-Choice Questions** - Multiple-choice questions are a close-ended question type in which a respondent has to select one (single-select multiple-choice question) or many (multi-select multiple choice question) responses from a given list of options. The multiple-choice question consists of an incomplete stem (question), right answer or answers, incorrect

answers, close alternatives, and distractors
Scaling Questions - These questions are based on the principles of the four measurement scales – nominal, ordinal, interval, and ratio.

- Pictorial Questions - This question type is easy to use and encourages respondents to answer. It works similarly to a multiple-choice question. Respondents are asked a question, and the answer choices are images. This helps respondents choose an answer quickly without over-thinking their answers, giving you more accurate data.

1.2 ISSUES ON FIELD RESEARCH : PILOT STUDY BASED ON QUESTIONNAIRE , ETHNOGRAPHIC FIELD DIARY: LONGITUDINAL STUDY CASE STUDY, ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

PILOT STUDY:

A pilot survey is **a strategy used to test the questionnaire using a smaller sample compared to the planned sample size**. In this phase of conducting a survey, the questionnaire is administered to a percentage of the total sample population, or in more informal cases just to a convenience sample.

Advantages of a pilot survey:

Conducting a pilot survey prior to the actual, large-scale survey presents many benefits and advantages for the researcher. One of these is the exploration of the particular issues that may potentially have an antagonistic impact on the survey results. These issues include the appropriateness of questions to the target population.

A pilot survey also tests the correctness of the instructions to be measured by whether all the respondents in the pilot sample are able to follow the directions as indicated. It also provides better information on whether the type of survey is effective in fulfilling the purpose of the study. Practically speaking, pilot surveys save financial resources because if errors are found in the questionnaire or interview early on, there would be a lesser chance of unreliable results or worse, that you would need to start over again after conducting the survey.

All in all, the main objective of a pilot study is to determine whether conducting a large-scale survey is worth the effort.

Types of Pilot Survey:

A. According to Organization

There are two types of pilot survey according to organization – external and internal. An external pilot survey intends to administer the questionnaire to a small group of target participants who will not be included in the main survey. On the other hand, an internal pilot survey will consider the respondents in the pilot as the first participants in the main survey.

B. According to Respondent Participation

There are two types of pilot survey according to the participation of the respondents – undeclared and participatory. In an undeclared pilot survey, you administer the survey to a certain number of respondents as if it is the real and full scale survey, not a pretest one. On the other hand, participatory pilot surveys involve informing the respondents that they are in

the pre-test phase. The respondents are to be asked what they can say about the questionnaire, specifically their reactions, comments and suggestions. For instance, you may ask them about how clear the instructions are or which questions are hard to answer. Converse and Presser (1986) recommend using the participatory pilot survey first, and then conducting the undeclared pilot.

The Results of a Pilot Survey:

After obtaining and analysing the results of the pilot survey, logistical, technical and other issues or problems can be addressed. The questionnaire or interview format can be revised, or the type of survey may be altered into a more suitable one. After the revision of the survey, the researcher may opt to conduct a second pilot survey to determine whether the errors and issues are effectively solved. If the problems were minor, then the large-scale survey can be executed.

❖ ETHNOGRAPHIC FIELD DIARY:

Ethnographic research **involves the study of people in situ**. It involves the study of informants, their actions and their activities as they occur. Such an approach presupposes that the researcher can gain access to informants and their activities.

Ethnographers have devoted a great deal of attention on the issues of writing the final product of ethnographic research, the ethnographic research report. The issues related to the process of writing ethnographic field notes, however, have received much less attention in methodological discussions. Emerson et al. (1995) point out that even after the discovery of 'writing' as a central practice of ethnographic research (Clifford & Marcus 1986, Van Maanen 1988), field notes remained as 'invisible work' in ethnographic literature. They argue that while many ethnographers are uneasy with the messy, unfinished, and personal character of their field notes, these have mostly remained private documents. Remaining private documents, the impact of field notes on research findings and results has also left unexplored. Why should we pay more attention to field notes? Although there is no consensus

concerning how ethnographic field notes should be written and what is their value in ethnographic research, most ethnographers (and many other qualitative researchers) produce some kind of field notes, particularly when doing observations. When planning and producing field notes in situ or after wards ethnographers continuously make choices about what to write down and how. Because it is impossible to collect data on everything and record all the things that are going on in the field, the researcher needs, by necessity, be selective in her writing. Furthermore, the researcher writes down her notes drawing from her sense making of the people, events and the situation and her interpretation can be different, or at least have different details and nuances, compared to another researchers' field notes from the same situation. Field notes are important because they involve the critical acts of sense making and interpretation, which inevitably have some kind of bearing

on the research findings and results. To be able to understand what kind of bearing the field notes can have on your research, it is necessary to practice reflexivity in respect to one's own field notes and their analysis. In this chapter, we will answer to the request of taking written field notes and their analysis more seriously in ethnographic research. Our main objective is to open up and analyse the process of writing and analysing ethnographic field notes. We will perform this through the investigation of our joint research project, which focused on business, technology and gender in the context of the Finnish ICT-sector. . In our investigation, we will practice reflexivity in terms of exploring the relationship between the researcher and the field, questioning the knowledge that is produced in field notes and in their analysis. More specifically, we will focus attention on how the social identities of the researchers affect how knowledge about the research subjects is produced and with kind of consequences. Our analysis elaborates two different modes of writing the field notes - selection and sense-making activities and textual practices of representation - and their implications on our research. In our analysis, we will pay close attention to the processes of exclusion, which take place through othering and marginalizing certain groups of actors involved in our research. With regards to selection and sense-making activities, we will ask what and who do we decide as 'important' and 'relevant' enough to be included into our field notes. We will also investigate why we considered some actors and events to be 'not-so-relevant' in relation to the goals of our project and how we justified these choices in our field notes. Through the analysis of our textual practices, we will further illustrate how and with what kinds of implications the 'relevant' and 'not-so-relevant' actors and encounters were crafted in our notes.

❖ **LONGITUDINAL STUDY:**

In a longitudinal study, researchers repeatedly examine the same individuals to detect any changes that might occur over a period of time.

Longitudinal studies are a type of correlation research in which researchers observe and collect data on a number of variables without trying to influence those variables.

While they are most commonly used in medicine, economics, and epidemiology, longitudinal studies can also be found in the other social or medical sciences.

❖ **CASE STUDY:**

The case study approach allows in-depth, multi-faceted explorations of complex issues in their real-life settings. The value of the case study approach is well recognized in the fields of business, law and policy, but somewhat less so in health services research. Based on our experiences of conducting several health-related case studies, we reflect on the different types of case study design, the specific research questions this approach can help answer, the data sources that tend to be used, and the particular advantages and disadvantages of employing this methodological approach. The paper concludes with key pointers to aid those designing and appraising proposals for conducting case study research, and a checklist to help readers assess the quality of case study reports.

❖ **ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA:**

Data collection is central part of community health improvement efforts. Sometimes, the aim is to learn more about a problem as it is experienced by a specific group of people; other times it is to see if people are better off after participating in an intervention. Most data is

collected through surveys, interviews, or observation. It's important to keep in mind the following when you collect data:

- It is good practice to let people know who you are (your name, organization and reason for collecting data when you ask them if they would like to participate. You should have permission from participants (people providing the data) and they should be made aware that their involvement is voluntary.
- Participants are free to withdraw from any active data collection or intervention program at any point without pressure or fear of retaliation. Avoid or minimize anything that will cause physical or emotional harm to participants.
- Make participants aware of any potential harm prior to their participation. Try to remain neutral and unbiased. Don't let your personal preconceptions or opinions interfere with the data collection process.
- Collecting data (i.e. through surveys) is often done under the assumption that information provided is confidential and the findings will be anonymous. You should let participants know when you will have to break confidentiality (e.g. in the case of harm to themselves or someone else) and whether results will be anonymous or not.
- When collecting data, try to avoid taking advantage of easy to access groups simply because they are there (this is called "convenience sampling"). Data should be collected from those that most help us answer our questions. Be respectful of people's time and when possible, compensate them for it.
- Be sure to protect the data you collect from people. Do not leave anything with personal information in a place that can easily be accessed by people who do not need to see the data (e.g. the back seat of your car). If possible, keep the information in a secure or locked location.
- After data are analyzed it is always good to share the results back to the participants. If anything on these guidelines is new to you, please consult with the NJHC's Data Committee. They can help design data collection activities that comply with these guidelines, and set you up to produce meaningful information for your workgroup.

1.3 FIELD TECHNIQUES : PARTICIPATORY RURAL APPRAISAL AND FOCUS GROUP DISCUSSION,

PARTICIPATORY RURAL APPRAISAL:

Participatory rural appraisal (PRA) is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes.

What is PRA process:

Participatory Rural Appraisal (PRA) is a **methodology used for interactive processes of social development**: It is a way of learning from people, with the people and by the people. It is, therefore, a methodology for analyses, planning, monitoring and evaluation.

"Participatory Rural Appraisal (PRA) recently renamed Participatory Learning for Action (PLA), is a methodological approach that is used to enable farmers to analyze their own situation and to develop a common perspective on natural resource management and agriculture at village level.

PRA is an assessment and learning process that empowers farmers to create the information base they need for participatory planning and action. Outsiders contribute facilitation skills and external information and opinions. Many different tools have been developed for use in PRA. There are four main classes: tools used in group and team dynamics; tools for sampling; options for interviews and dialogue; and options for visualization and preparing diagrams. Most countries have had some experience with PRA and local publications are available. IIED regularly reports on new developments in its PLA notes (Pretty et al 1995)."

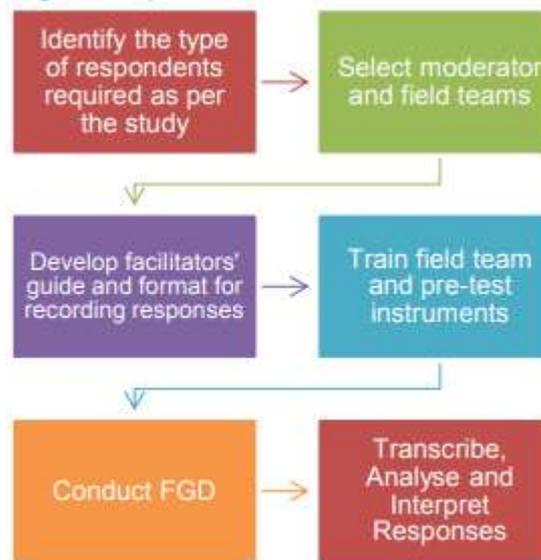
❖ **FOCUS GROUP DISCUSSION:**

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Key Features of FGDs:

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Major steps involved in FGDs:



Advantages of focus groups:

Focus groups have several advantages for collecting qualitative research data. Focus group research can be used purely as a qualitative method or in combination with quantitative methods. Qualitative data collected in focus groups can help researchers decide what kinds of items to include in surveys. The moderator can inquire into and examine unforeseen issues with that arise in the context of the discussion. The format has a kind of face-validity and is naturalistic in that the discussion can include storytelling, joking, disagreements, and boasting. Running focus groups is straightforward and relatively expensive. Focus groups ordinarily consume less time than structured interviews, thus increasing sample sizes, lessening resource investment, and providing fast results. Focus groups tend to be more efficient when the data being gathered are related to the researcher's interests. They are helpful and important for needs assessments and project evaluations. A focus group discussion can create a synergy that can provide information that can't be gained in other ways. Vocabulary can be observed. New, insightful perspectives and opinions are obtained. Sensitive topics can be discussed, leading to personal disclosures

1.4 POST FIELD TECHNIQUES: METHODS OF REPORT WRITING , TRANSCRIPTION FROM ETHNOGRAPHIC FIELD NOTES , AUDIO-VIDEO RECORDINGS, PARTICIPANT OBSERVATION, PRA AND FGD

• TRANSCRIPTION FROM ETHNOGRAPHIC FIELD NOTES:

For researchers doing qualitative research, interviews are a commonly used method. Data collected through interviews can be recorded through field notes, transcripts, or tape recordings. In the literature, there is a debate regarding which of these recording methods should be used. There are issues of reliability, cost (time and money), loss of data, among others. Technology plays a pivotal role in this debate. Indeed, new technologies (e.g., direct

coding) are often seen as potential replacements for older technologies (e.g., transcripts), which leads to a debate that is based on an evolution narrative (from field notes, to transcripts, to working from tape recordings). A combination narrative should be considered where combination is better than substitution. Moreover, combining the advantages of field notes, transcripts, and working from tape recordings without accumulating each method's disadvantages is possible because of new technology. Two technological tools (OneNote and SmartPen) are presented as a way to increase the effectiveness, efficiency, and economy of qualitative data management.

Fasick (1977) mentioned the cost and difficulties associated with transcripts. Indeed, although the equipment itself was quite cheap, the transcription process was not. Nevertheless, in the 1980s, transcripts were crucial because searching through cassettes was a cumbersome task and cassettes themselves were not permanent (i.e., tapes get damaged). Hence, producing a transcript was an essential step in translating recordings into searchable and analysable documents. To this effect, transcription techniques evolved and were refined to include as much information as possible in transcripts. Many notation systems were developed;

The invention of digital recorders made the transcript method even better for several reasons. First, digital files do not get damaged with time and backups are easily stored to ensure the integrity of the files. Thus, digital recorders provide unlimited "replayability." Second, software developed for digital sound files makes it easier to jump through interviews when searching for a specific excerpt. Hence, transcripts based on digital files allow for the data to be retrieved and examined in a more flexible manner (Heritage, 1984; Lapadat & Lindsay, 1999). Moreover, the accessibility of digital files means that recorded data can be reused and reanalysed in the context of another study because "the original data are neither idealized nor constrained by a specific research design or by reference to some particular theory or hypothesis" (Heritage, 1984)

Although Fasick (1977) originally doubted the usefulness of transcripts, they are now used extensively (Davidson, 2009), with a wide range of possibilities as to how transcripts are produced whether the transcript is naturalised (writing that reflects words being said) or denaturalised (writing that reflects ideas being said) (Bucholtz, 2000). This is so, because transcripts have several advantages over field notes, one of which is the possibility of accessing, to a certain extent, the event itself in much more detail than field notes. As explained by Duranti *International Journal of Qualitative Methods* 2012, 11(4) 450 (1997), the ability to stop the flow of discourse allows researchers to focus on details, such as hesitations, restarts, and cut-offs in participants' speech (see also Hamo et al., 2004; Heritage, 1984; Silverman, 1993). Moreover, transcripts help prevent infatuation with the field, which occurs when researchers become too close to participants and their world, by providing physical and emotional distance between the researcher and the field (Hamo et al., 2004). Transcripts are therefore "an essential corrective to the limitations of intuition and recollection" (Heritage, 1984, p. 238). In short, transcripts are more complete and more reliable than field notes (Lapadat & Lindsay, 1999).

Transcripts, however, are not a perfect solution and have some problems such as cost and time as mentioned above (Fasick, 1977; Lapadat & Lindsay, 1999). Indeed, the amount of time required to produce transcripts is fairly important (Bertrand et al., 1992), and for every

hour of taped interview, 6-7 hours of transcription is required (Britten, 1995). This time delay between the interview and the production of transcripts is a problem because it slows the progression of the research (Tilley, 2003).

- **PARTICIPANT OBSERVATION:**

Participant observation is in some ways both the most natural and the most challenging of qualitative data collection methods. It connects the researcher to the most basic of human experiences, discovering through immersion and participation the hows and whys of human behavior in a particular context. Such discovery is natural in that all of us have done this repeatedly throughout our lives, learning what it means to be members of our own families, our ethnic and national cultures, our work groups, and our personal circles and associations. The challenge of harnessing this innate capability for participant observation is that when we are participant observers in a more formal sense, we must, at least a little, systematize and organize an inherently fluid process. This means not only being a player in a particular social milieu but also fulfilling the role of researcher—taking notes; recording voices, sounds, and images; and asking questions that are designed to uncover the meaning behind the behaviors. Additionally, in many cases, we are trying to discover and analyze aspects of social scenes that use rules and norms that the participants may experience without explicitly talking about, that operate on automatic or subconscious levels, or are even officially off limits for discussion or taboo. The result of this discovery and systemization is that we not only make ourselves into acceptable participants in some venue but also generate data that can meaningfully add to our collective understanding of human experience.

Participant observation is used across the social sciences, as well as in various forms of commercial, public policy, and nonprofit research. Anthropology and sociology, in particular, have relied on participant observation for many of their seminal insights, and for most anthropologists and many sociologists, doing a participant observation study at a field site is an important rite of passage into the discipline. Bronislaw Malinowski's (1922) work among the Trobriand Islanders is not only one of the foundational works of ethnography, but it is also one of the earliest to both exemplify and articulate the value of participant observation. Sociologists also conducted participant observation studies and discussed the use of the technique early on, including Beatrice Webb (1926) in the 1880s and the Chicago school of urban sociologists in the 1920s (Park, Burgess, & McKenzie, 1925)

THE ROLE OF PARTICIPANT OBSERVATION IN THE RESEARCH PROCESS:

The most traditional use of participant observation is at the exploratory stages of the research on a new topic, culture, venue, or behavior. In these situations, it is hard to beat participant observation for the sheer volume of insight and information that can be collected. Spending time working, playing, or living with people will produce data that would require dozens of interviews or focus groups to uncover. And, as indicated in the example of Koester's IV drug user research, there are often findings that might be completely missed using other methods.

But participant observation can also play an important role when examining topics where there is already a considerable body of knowledge. As with other qualitative methods, participant observation can often help explain quantitative findings by providing the contextual meaning behind other data. In these cases, the participant observation may occur after or at the same time as other forms of data collection, such as analysis of secondary data or a quantitative survey. The participant observation may be used to explain apparent contradictions in other data—as work, to learn the causal relationship behind a numerically observed correlation—or to confirm or gain face validity (sometimes referred to as triangulation) for the findings produced by another research method.

The ability of participant observation to provide explanation, context, causation, and confirmation means that it is often a useful element to include in a mixed method study. As indicated above, the participant observation may occur at multiple stages of the research—either early on as an exploratory element or later as an explanatory or confirmatory element.

3.1 APPLICATION OF QUALITATIVE RESEARCH TECHNIQUES: STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES; SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OF ANY SECTOR.

STAKEHOLDER ANALYSIS

Stakeholder analysis is an extremely useful technique for identifying, understanding, and prioritizing all stakeholders who may wield influence or power over a business or project.

Among other things, analyzing stakeholders will reveal who they are, what their needs and expectations may be, and what issues matter to them (and to what degree). Just as importantly, this exercise will tell you their true level of interest and/or influence over your project.

A thorough analysis will ensure that all affected parties are duly considered. Having access to this knowledge can greatly improve the outcomes of conflict resolution. It can also make your day-to-day [stakeholder engagement](#) efforts much more targeted.

Why analyse stakeholders?

Not all stakeholders deserve the same amount of attention.

This is why conducting stakeholder analysis is so beneficial. It allows you to properly identify all stakeholders and to categorize them in order of importance as it pertains to your efforts to secure social acceptance and ensure successful project delivery.

More specifically, this analysis will tell you the interests of all stakeholders who may impact or be impacted by the project, the attributes of project advocates and opponents, as well as the interrelationships and interfaces that exist between them.

In other words, it will tell you how these different groups interact and how this interaction may be serving or jeopardizing your interests.

During your stakeholder analysis, you'll also uncover any potential risks, issues or misunderstanding that could disrupt the project. This information is vital for knowing what type of communication and messaging will best help to minimize perceived negative impacts and amplify positive impacts.

Stakeholder analysis will identify who exactly you should be engaging, informing and/or encouraging to participate during the project's execution phase – and to what extent.

This valuable information should serve as the foundation for your stakeholder management strategy and messaging. When performed on an ongoing basis, stakeholder analysis will also tell you how your key stakeholder groups are changing over time – in terms of who they are, how their needs or expectations may be evolving, and how your relationship with them has improved – or deteriorated.

This article explores the different types of stakeholder analysis, what elements they have in common and what the benefits of conducting ongoing stakeholder analysis are. (Hint: It has to do with classifying stakeholders based on their influence and power and then understanding their motivations so that you can prioritize your efforts and resources accordingly to achieve the desired outcomes).

How to identify stakeholders?

Stakeholders can be identified in a number of ways:

Team brainstorming: The idea here is to come up with the longest possible list of potential stakeholders. Not all suggestions will be retained but reserve judgment for the end. It's better to weed out than to overlook.

Team members' experience: Chances are your team has built up valuable knowledge over time, so be sure to tap into it.

Historical data: Your organization may have accumulated piles of data from previous projects. Using this data to inform your stakeholder analysis simply makes sense as it promotes efficiency and building on experience.

Comparable: Sometimes you'll be operating in a new location or on a different type of project. Whenever possible, look for similar projects and identify stakeholders who may have played a key role. Chances are the same types of stakeholders will impact (or be impacted by) your current project.

The more approaches you use, the less likely you are to overlook key stakeholders

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME:

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats, and so a SWOT Analysis is a technique for assessing these four aspects of your business.

You can use SWOT Analysis to make the most of what you've got, to your organization's best advantage. And you can reduce the chances of failure, by understanding what you're lacking, and eliminating hazards that would otherwise catch you unawares.

Better still, you can start to craft a strategy that distinguishes you from your competitors, and so compete successfully in your market.

SWOT Analysis:

A parameter to examine the growth and performance of women entrepreneurs development in India.

STRENGTH

- Women entrepreneur can be defined as a confident, innovative and creative women capable of achieving self economic independence individually or in collaboration, generate employment opportunities for others through initiating, establishing and running the enterprise by keeping pace with her personal, family and social life.
- Women prefer to work from their own residence, difficulty in getting suitable jobs and desire for social recognition motivates them self-employment.

Weaknesses

- Absence of proper support, cooperation and back-up for women by their own family members and the outside world people force them to drop the idea of excelling in the enterprise field.
- Women's family obligations also bar them from becoming successful entrepreneurs in both developed and developing nations.
- Achievement motivation of the women folk found less compared to male members. • The greatest deterrent to women entrepreneurs is that they are women.

Opportunity

- Women inculcate entrepreneurial values and involve greatly in business dealings.
- Business opportunities that are approaching for women entrepreneurs are eco- friendly technology, Bio-technology, IT enabled enterprises, event management, tourist industry, Telecommunication, Plastic materials, Mineral water, Herbal & health care, Food, fruits and vegetables processing.
- Women entrepreneurs avail new opportunities in the rural areas such as Ice cream, channel products, papads and pickles and Readymade garments.

Threats

- Fear of expansion and Lack of access to technology
- Lack of self-confidence, will power, strong mental outlook and optimistic attitude amongst women creates a fear from committing mistakes while doing their piece of work.

- Credit discrimination and Non Cooperative officials.
- Insecure and poor infrastructure and Dealing with male labourers. • Indian women give emphasis to family ties and relationships.

3.2 APPLICATION OF STATISTICAL TECHNIQUES IN DEMOGRAPHIC DATA ANALYSIS: POPULATION COMPOSITION, OCCUPATIONAL STRUCTURE, DEPENDENCY RATIO, & MEASUREMENT OF MIGRATION BASED ON CENSUS.

POPULATION COMPOSITION

Population Composition Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

AGE SEX STRUCTURE

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

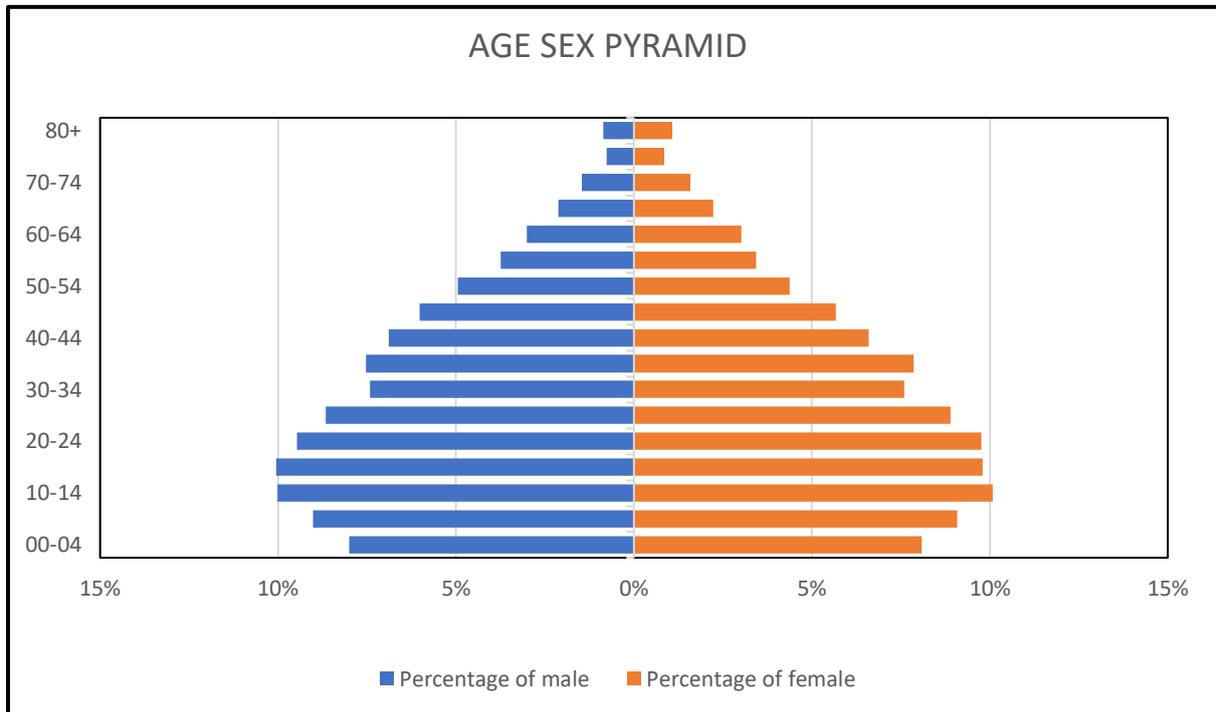
SEX RATIO

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males

POPULATION PYRAMID

The Sex Ratio Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

Age Group	Male	Female	Total	Percentage of male	Percentage of female
00-04	37,43,862	35,89,281	73,33,143	-8%	8%
05-09	42,16,763	40,31,046	82,47,809	-9%	9%
10-14	46,77,506	44,79,017	91,56,523	-10%	10%
15-19	47,02,325	43,55,706	90,58,031	-10%	10%
20-24	44,22,630	43,35,692	87,58,322	-9%	10%
25-29	40,44,904	39,53,005	79,97,909	-9%	9%
30-34	34,64,659	33,76,931	68,41,590	-7%	8%
35-39	35,23,361	34,89,285	70,12,646	-8%	8%
40-44	32,19,604	29,33,456	61,53,060	-7%	7%
45-49	28,14,212	25,21,507	53,35,719	-6%	6%
50-54	23,17,232	19,40,648	42,57,880	-5%	4%
55-59	17,46,903	15,21,747	32,68,650	-4%	3%
60-64	14,06,401	13,39,053	27,45,454	-3%	3%
65-69	9,91,280	9,91,713	19,82,993	-2%	2%
70-74	6,86,881	7,03,726	13,90,607	-1%	2%
75-79	3,60,216	3,79,551	7,39,767	-1%	1%
80+	4,06,536	4,77,025	8,83,561	-1%	1%
Total	4,67,45,275	4,44,18,389	9,11,63,664		



OCCUPATIONAL STRUCTURE

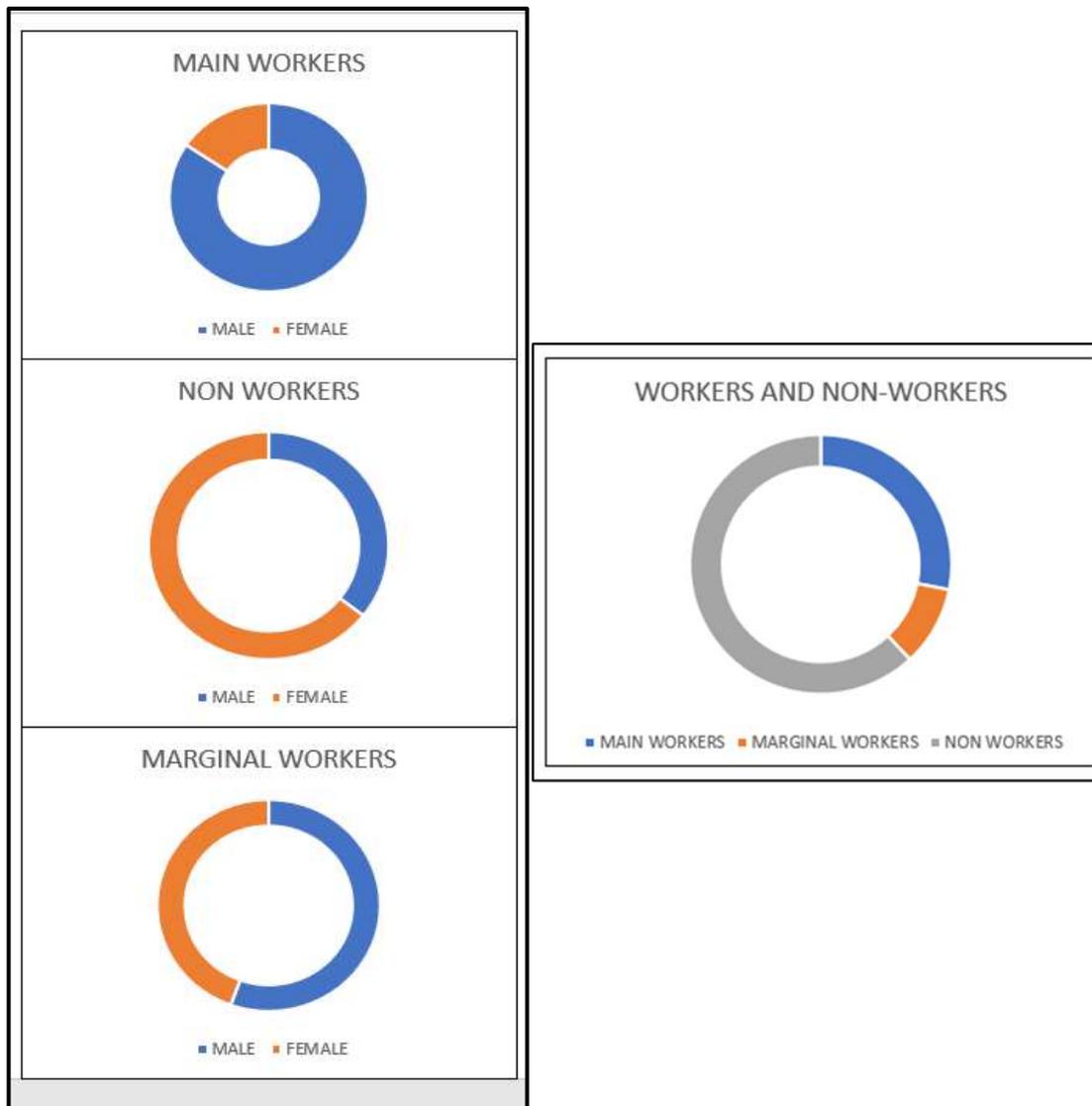
The occupational structure of a nation refers to the percentage of its workforce employed in various economic ventures. To put it in other words, articulating the number of the total working population employed in agriculture and associated activities and the number of them involved in the manufacturing and service sectors can be identified from the occupational structure of the nation.

SIGNIFICANCE

- It reflects the close relationship between economic development and occupational structure.
- It gives proper illustration of ratio and spatial distribution of working and non-working population.
 - This relevant data have its own utility and role in policy making
 - The proportion of workers engaged in various occupation highlights economic and cultural development.
- The significance of occupational distribution of population of a region lies in the fact that, it clearly reveals the socio-economic characteristics of the people living that particular region. It is, hence, one of the important measures of socio-economic development of the country.

OCCUPATIONAL STRUCTURE OF KOLKATA (WEST BENGAL, CENSUS 2011).

WORKERS AND NONWORKERS			
	MALE	FEMALE	TOTAL
MAIN WORKERS	21678279	4008351	25686630
MARGINAL WORKERS	5037768	4031957	9069725
NON WORKERS	20092980	36426780	56519760



INTERPRETATION

We have shown occupational structure of Kolkata (census 2011) by these three-pie diagram. These diagrams have shown proportion of main workers, non-workers and marginal workers. The proportion of male workers are higher than the females in main and marginal working groups and number of females are high in non-working groups. In another pie the proportion of marginal working population is lower than main and non-working population.

CATEGORY OF WORKERS (MAIN & MARGINAL) (WEST BENGAL, CENSUS 2011)

	MALE	FEMALE	TOTAL
CULTIVATORS	4500041	616647	5116688
AGRICULTURAL LABOURERS	7452814	2736028	10122842
HOUSEHOLD WORKERS	1114683	1349441	2464124
OTHER WORKERS	13648509	3338192	16986701

DISTRIBUTION OF WORKERS



- CULTIVATORS
- AGRICULTURAL LABOURERS
- HOUSEHOLD WORKERS
- OTHER WORKERS

INTERPRETATION

We have shown category of workers (main & marginal workers) of Kolkata (census 2011) these pie diagram. These diagrams have shown proportion of cultivators, agricultural labourers, household workers & other workers. The proportion of others workers are higher than the cultivators, agricultural labourers and household working groups. The proportion of household workers are lower than the cultivators, agricultural labourers and others working groups.

INDUSTRIAL COMPOSITION, NORTH INDIAN STATES , 2001

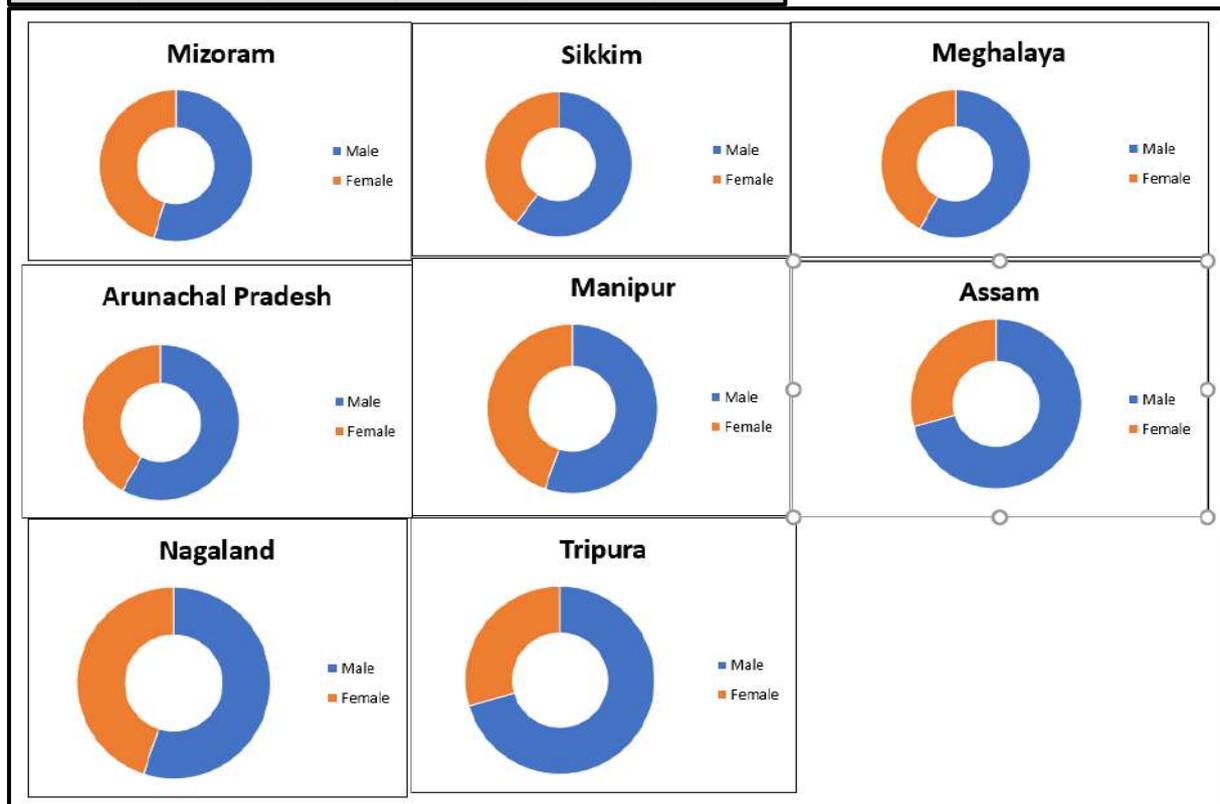
STATES/UNION TERRITORY	CULTIVATORS	AGRICULTURAL LABOURERS	HOUSEHOLD INDUSTRY	OTHERS WORKERS
ASSAM	39.1	13.2	3.6	44
MEGHALAYA	48.1	17.7	2.2	32
MANIPUR	40.2	12	10.3	37.6
MIZORAM	54.9	5.7	1.5	37.9
NAGALAND	64.7	3.6	2.6	29
TRIPURA	27	23.8	3	46.1
ARUNACHAL PRADESH	57.8	3.9	1.3	37
SIKKIM	49.9	6.5	1.6	42
TOTAL	381.7	86.4	26.1	305.6



INTERPRITATION

We have shown industrial composition of North Indian States in 2001 by these pie-diagram. These diagrams have shown proportion of cultivators, agricultural labourers, household workers & other workers. The proportion of cultivators are higher than agricultural labourers, household workers & other workers in Mizoram, Nagaland, Meghalaya, Sikkim & Arunachal Pradesh. In another pie the proportion of other workers are higher than cultivators, agricultural labourers & household workers in Tripura & Assam. In another pie the proportion of cultivators and other workers are equal than agricultural labourers & household workers in Manipur.

India: Work Participation Rate North-Eastern States (2001)			
State	Male	Female	
Mizoram	57.3	47.5	
Sikkim	57.4	38.6	
Arunachal	50.6	36.5	
Manipur	48.1	39	
Nagaland	46.7	38.1	
Meghalaya	48.3	35.1	
Tripura	50.6	21.1	
Assam	49.9	20.7	
Total	408.9	276.6	



INTERPRETATION

We have shown work participation rate of North-Indian States in 2001 by these pie-diagram. These diagrams have shown proportion of male & female person. The proportion of male person are higher than female person in North-Eastern States.

DEPENDENCY RATIO

The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

The total (or Age) dependency ratio is the ratio of the sum of the population aged 0-14 and that aged 65+ to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

The child dependency ratio is the ratio of the population aged 0-14 to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

The old-age dependency ratio is the ratio of the population aged 65 years or over to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

In published international statistics, the dependent part usually includes those under the age of 15 and over the age of 64. The productive part makes up the population in between, ages 15-64. It is normally expressed as a percentage:

$$\begin{aligned} \text{(Total) Dependency ratio} = & \left[\frac{\text{(number of people aged 0 to 14} \right. \\ & \left. + \text{(number of people aged 65} \right. \\ & \left. \text{and over)} / \text{number of people aged} \right. \\ & \left. 15 \text{ to 64} \right] * 100 \end{aligned}$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. This results in direct impacts on financial expenditures on things like social security, as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and the aged dependency ratio :

$$\begin{aligned} \text{Child dependency ratio} = & \left[\frac{\text{number of people aged 0 to 14}}{\right. \\ & \left. \text{Number of people aged 15 to 64}} \right] \\ & * 100 \end{aligned}$$

$$\begin{aligned} \text{Aged dependency ratio} = & \frac{\text{number of people aged 65 to 100}}{\text{Number of people aged 15 to 64}} \\ & * 100 \end{aligned}$$

Age Group	Male	Female	Total				
00-04	37,43,862	35,89,281	7333143				
05-09	42,16,763	40,31,046	8247809	24737475			
10-14	46,77,506	44,79,017	9156523				
15-19	47,02,325	43,55,706	9058031		40.26986		
20-24	44,22,630	43,35,692	8758322				
25-29	40,44,904	39,53,005	7997909				
30-34	34,64,659	33,76,931	6841590				
35-39	35,23,361	34,89,285	7012646	61429261			47.69168
40-44	32,19,604	29,33,456	6153060				
45-49	28,14,212	25,21,507	5335719				
50-54	23,17,232	19,40,648	4257880		47.69168		
55-59	17,46,903	15,21,747	3268650				
60-64	14,06,401	13,39,053	2745454				
65-69	9,91,280	9,91,713	1982993				
70-74	6,86,881	7,03,726	1390607		7.421821		
75-79	3,60,216	3,79,551	739767	4559170			
80+	4,06,536	4,77,025	445803				
Total	4,67,45,275	4,44,18,389	90725906				

MEASUREMENT OF MIGRATION BASED ON CENSUS DATA

The phenomenon of migration is at the centre of the major challenges of the twenty-first century, as evidenced by the intensity of the international agenda on the issue. Indeed, there has been a multiplication of high-level meetings sanctioned by important resolutions that have emphasized the need for international cooperation in response to migration. The holding of the World Summit on International Migration and Development in New York in September 2006 marks a decisive turning point in the integration of migration into development strategies, policies and programs. 4 www.ins.ne MIGRATION MEASUREMENT Thus, since 2007, a global forum on migration and development has been held annually. Is it also important to underline the Rabat Process (Morocco) as a framework for dialogue on migration, which periodically organizes Euro-African Ministerial Conferences on Migration and Development, the most recent of which held in Rome / Italy on 27 November 2014, adopted a declaration and its annex, the Rome program.

The main objective of this presentation is to describe the different measures of migration by reviewing the definitions and concepts as well as the difficulties associated with studies on

1. Population of Madras, 1951 = p_t =	1,416,056
2. Population of Madras, 1961 = p_{t+1} =	1,729,141
3. Increase in population, 1951-1961 = (2) - (1) =	313,085
4. Number of births in Madras, 1951-1961 = B =	653,190
5. Number of deaths in Madras, 1951-1961 = D =	371,286
6. Natural increase in Madras, 1951-1961 = (4) - (5) =	281,904
7. Net migration to Madras, 1951-1961 = (3) - (6) =	31,181

SOURCE: The population figures are taken from *Census of India*, vol. IX, *Madras*, part II-A. The figures of births and deaths are taken from *Vital Statistics of India, 1962*, issued by the Registrar General, India.

migration and migration typologies.

Measurement of migration:

Cross sectional measures : migration rates-

- Let M be the number of migrations (inputs and outputs) observed in a population over a period of n years in a region i .
- Let P_0 et P_n be the population at beginning and en of period.
- The gross migration m is given by :

$$m = \frac{M}{\frac{n}{2}(P_0 + P_n)} \quad k$$

$k = 100, 1000$ ou 10000

- In the same way, the gross emigration rate (or exit index) of an area i is calculated :

$$m_{ia} = \frac{M^{ia}}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

- In the same way, one calculates the gross rate of immigration (or index of entry) of a zone i :

$$m_{ai} = \frac{M^{ai}}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

longitudinal measures : mobility quotient-

- The net rate of migration

$$m_{ai} - m_{ia} = \frac{M^{ai} - M^{ia}}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

- Emigration quotient

$$e_x = \frac{E_x}{S_x + \frac{I_x - D_x}{2}}$$

e_x = quotient of emigration at the exact age x

S_x = survivor at exact age x

E_x = emigration at the end of age x

I_x = Immigration at the correct age x

D_x = Deaths at full age x

Indirect measures of mobility-

- natural movement method : This method make it possible to estimate the number of migrants.
- For net migration by age the formula gives :

$$P_{i(x)}^t = P_{i(x)}^0 + N_{i(x)} - D_{i(x)} + M_{ai(x)} - M_{ia(x)}$$

- The net balance of international migrants can therefore also be calculated if the number of international migrants is available through this formula:

$$M_{ai(x)} - M_{ia(x)} = P_{i(x)}^t - P_{i(x)}^0 - N_{i(x)} + D_{i(x)}$$

3.3 APPLICATION OF GIS AND RS : PREPARATION OF LAND USE MAP USING OPEN SOFT WARE , MAPPING OF HUMAN HABITATION AND DETECTION OF CHANGE FROM MULTI-DATED MAPS AND IMAGE

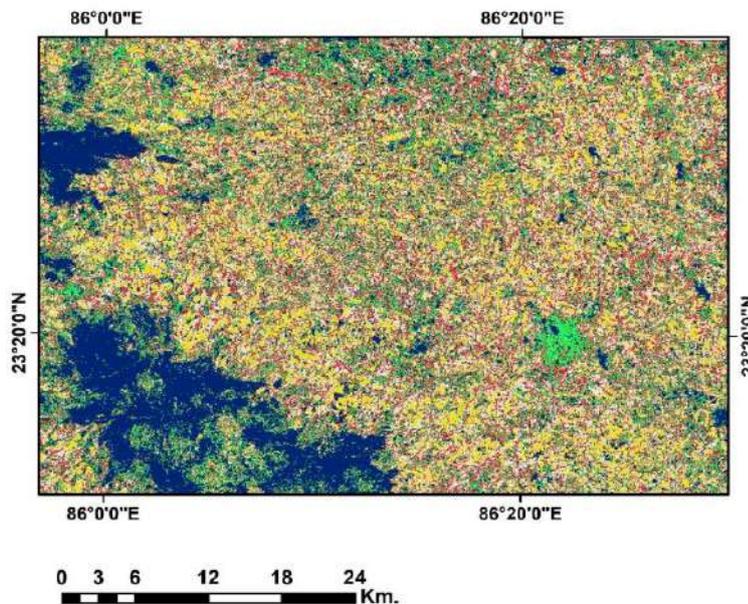
LAND USE MAPPING

City planners need to know which areas of a city are used for which purpose. Therefore, they produce a map of "land use", that identifies parts of a city and the major activities (land use) that happen there. Remote sensing imagery is very useful for this purpose, since you certainly don't want to spend many weeks or months walking or driving around a city to map its land use. But to use remote sensing imagery effectively, you have to be able to interpret it accurately.

The satellite image in this activity shows a part of downtown Montreal. It will be a bit harder to interpret this black and white image, because you don't have colour clues to rely on. But you can see quite a bit of spatial detail - even individual streets and large buildings.

Rowid	VALUE	COUNT	Area	Landuse_units
0	1	115271	4.349641	Settlement
1	2	406199	15.32753	Reservoir
2	3	554870	20.93749	Vegetation
3	4	660826	24.93564	Marshy Land
4	5	912961	34.44971	Agricultural land
		2650127	100	

Preparation of a simple landuse map



Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

INTERPRETAION:

This is a landuse map of Eastern part of Bankura , and there latitudinal and longitudinal extension are 86 0' e and 86 20'e and 23 20n. In this landuse map a huge percentage of land is used as agricultural land about 34.44971%,24.93564% of marshy land, 20.93749% of vegetation cover and 15.32753% of reservoir and only 4.34% land used for settle ment purpose.

MAPPING OF HUMAN HABITATION AND DETECTION OF CHANGE FROM MULTIDATED MAPS AND / OR IMAGES

Calculation for human habitation change from (1984-2020)

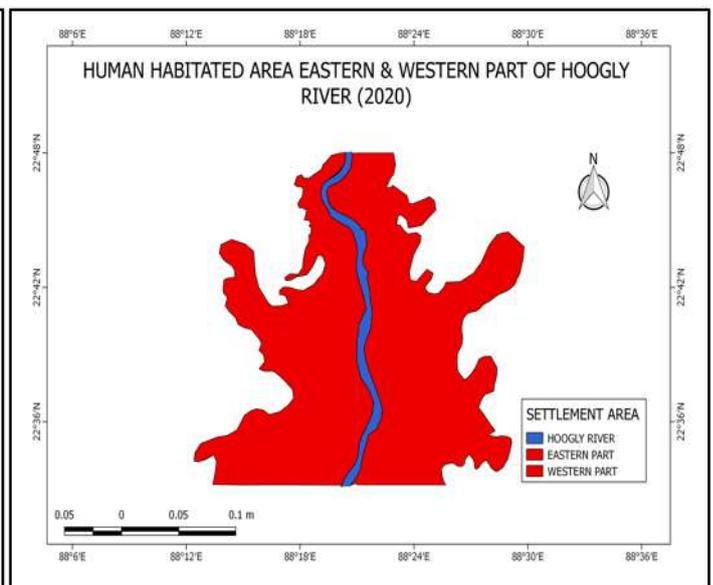
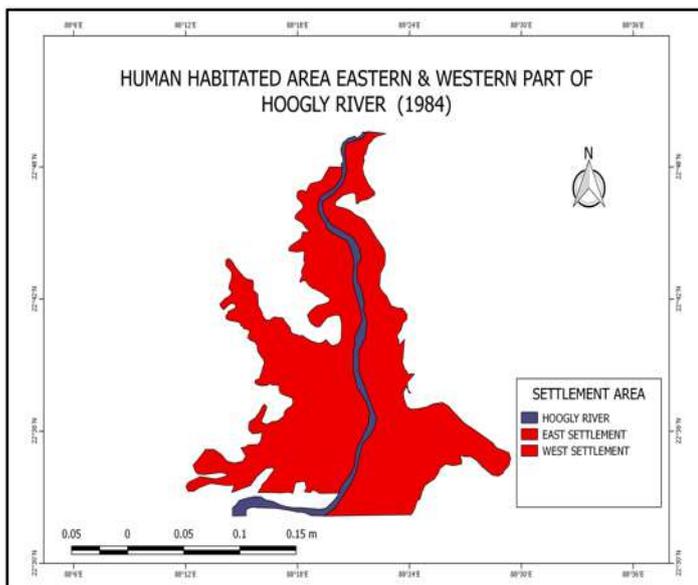
Settlement area of 2020 - settlement area of 1984

Settlement area of 1984 *100

$$\text{EAST} = \frac{1.283589 - 2.142077}{1.283589} * 100$$

$$\text{WEST} = \frac{1.708509 - 1.883469}{1.708509} * 100$$

HABITAT CHANGE IDENTIFICATION ON THE BANKS OF RIVER HOOGHLY (1984-2020)



INTERPRETATION:

Here we have prepared two thematic maps which shows the comparative analysis of habitation of two sides of Hooghly river between 1984 and 2020. The settlement density in the eastern part of Hooghly river was sq.km in 1984, it has changed about 66.88% in the past 4 decades. Whereas in the same period of time the settlement density in the western part of the Hooghly river has changed only 10.24% .

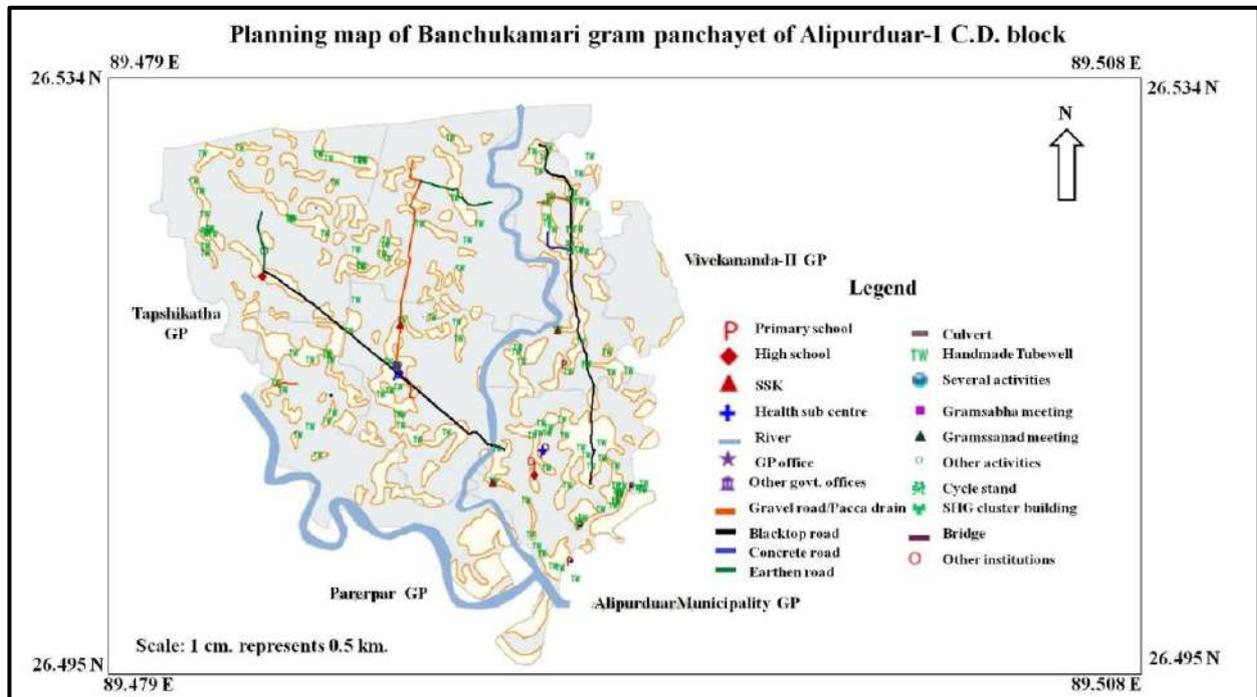
	1984	2020
EAST BANK	1.283589912	2.142077
WEST BANK	1.708509	1.883469

3.4 SPATIAL PLAN FORMULATION AND LAYOUT FOR A VILLAGE PLANNING MAP BASED ON THE ABOVE TECHNIQUES AND ON AVAILABLE INFORMATION FROM PRI

SPATIAL PLAN FORMULARION:

The use of the term spatial planning to describe the activities, processes, practices and the accompanying legal and institutional milieu described in this book is quite recent. Since its inception, the activity of planning has been known and continues to be known by other related terminologies including: 'land use planning', 'physical planning', 'urban planning', 'town and country planning', 'regional planning' and even just 'planning'. As we will show shortly, just as societies in general continue to evolve and the prevailing socio-environmental and economic challenges of the day continue to assume different degrees of complexity, so has planning, which seeks to confront these complex challenges evolved in terms of the underlying theories and the nature and scope of the activities associated with it in practice. In general, the nature and scope of planning within any given society, indicative of the terminology used, reflect the priorities of that society, which in turn determine the focus and core functions embraced by the activity. In some instances, the terminologies used also indicate the spatial scale (i.e. whether town, city, regional or national level) at which the activity of planning is undertaken. With this recognition at the background, we will in the sections that follow, review the meanings of some of these terminologies, learning in the process why we have come to use the term spatial planning.

VILLAGE PLANNING BASED ON THE ABOVE TECHNIQUES:



INTERPRETATION:

This is a village planning map of Banchukumari Grampanchayat of Alipurduar-I C-D block. This gram panchayat has a boundary with four other gram panchayat, Vivekananda –II and Alipurduar municipality in the eastern side and Tapshikatha and Parerpar in the western side of this gram panchayat. Four primary schools and two high schools have found in this map. Three Shishu Shiksha kendra, two health sub center situated in this Panchayat. Two Blacktop road, two earthen road, one concrete road has found in this panchayat area.

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Paper code: GEOPDSE04P

**Paper name: Regional Planning And
Rural Development Practical**

CONTENT

❖ **Rural research method and methodology**

- Pre- field issues on rural research
- Issues on field research
- Field techniques: PRA, FGD
- Post field techniques

❖ **Techniques and formulation of rural planning through data analysis**

- Application of qualitative research techniques
- Application of statistical techniques in demographic data analysis
- Application of GIS and RS

RURAL RESEARCH METHODS AND
METHODOLOGY

Research: Definition, Methods, Types & Examples

Definition: Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.”

Inductive research methods analyse an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

Characteristics of research

- Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

Purpose of research:

There are three main purposes:

- **Exploratory:** As the name suggests, researchers conduct exploratory studies to explore a group of questions. The answers and analytics may not offer a conclusion to the perceived problem. It is undertaken to handle new problem areas that haven't been explored before. This exploratory process lays the foundation for more conclusive data collection and analysis.
- **Descriptive:** It focuses on expanding knowledge on current issues through a process of data collection. Descriptive studies describe the behaviour of a sample population. Only one variable is required to conduct the study. The three primary purposes of descriptive studies are describing, explaining, and validating the findings.
- **Explanatory:** Causal or explanatory research is conducted to understand the impact of specific changes in existing standard procedures. Running experiments is the most popular form.

Types of research methods and example

Research methods are broadly classified as Qualitative and Quantitative.

Both methods have distinctive properties and data collection methods.

Qualitative methods -Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Types of qualitative methods include:

One-to-one Interview

Focus Groups

Ethnographic studies

Text Analysis

Case Study

Quantitative methods –

Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

Types of quantitative methods include:

Survey research

Descriptive research

Correlational research

8 tips for conducting accurate research:

- Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.
- Keep track of the frequency with which each of the main findings appears.
- Make a list of your findings from the most common to the least common.
- Evaluate a list of the strengths, weaknesses, opportunities, and threats that have been identified in a SWOT analysis.
- Prepare conclusions and recommendations about your study.
- Act on your strategies
- Look for gaps in the information, and consider doing additional inquiry if necessary
- Plan to review the results and consider efficient methods to analyse and dissect results for interpretation

Literature review-

- A **literature review** is an overview of the previously published works on a specific topic. The term can refer to a full scholarly paper or a **section** of a scholarly work such as a book, or an

article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work. Producing a literature review is often a part of graduate and post-graduate student work, including in the preparation of a thesis, dissertation, or a journal article.

There are five key steps:

Search for relevant literature

Evaluate sources

Identify themes, debates and gaps

Outline the structure

Write literature review

A good literature review doesn't just summarize sources—it analyses, synthesizes, and critically evaluates to give a clear picture of the state of knowledge on the subject.

Research each question

Once you have a list of questions that could be explored, you must conduct thorough research on them. What does this mean? Read more about each doubt or query that you have. Find out if other researchers have had similar questions and whether they have found answers to them. This will help you avoid duplication of work.

Research problem

A research problem is a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. In some social science disciplines the research problem is typically posed in the form of a question. A research problem does not state how to do something, offer a vague or broad proposition, or present a value question.

The purpose of a problem statement is to:

Introduce the reader to the importance of the topic being studied. The reader is oriented to the significance of the study and the research questions or hypotheses to follow.

Places the problem into a particular context that defines the parameters of what is to be investigated.

Provides the framework for reporting the results and indicates what is probably necessary to conduct the study and explain how the findings will present this information.

How to identify a research problem?

After choosing a specific topic for your academic paper, you need to state it as a clear research problem that identifies all the issues that you'll address. It's not always simple for students to formulate it. In some fields, they may end up spending a lot of time thinking, exploring, and studying before getting a clear idea of what research questions to answer.

Some research paper topics are too broad to give a researchable issue. For example, if you decide to study certain social issues, like child poverty, remember that they don't provide any researchable question. These are very broad to address and take a lot of time and resources to become unfeasible so that your study will lack enough focus and depth.

Framing research questions and hypothesis

Research question is 'a question that a research project sets out to answer'. Choosing a research question is an essential element of both quantitative and qualitative research. Good research questions seek to improve knowledge on an important topic, and are usually narrow and specific.
frame a hypothesis from research question :

A hypothesis by definition is a proposition or a number of propositions that reflect a prediction. In simpler words, a hypothesis is a statement that assumes a relationship between an independent variable and a dependent variable. In research, hypotheses provide the basis for data collection and data analysis. The data analysis is essentially applications of research tools and techniques to prove or disprove the hypothesis. However, before testing, it is important to frame the hypotheses properly. This sometimes poses a challenge.

Need for framing a hypothesis from research questions

Not all types of research require a hypothesis. The need for framing a hypothesis stems from the research questions and the research methodology. It depends on the research approach, research type, and research method. Framing a hypothesis is essential in cases:

When the research type was descriptive-

Descriptive research is the one that aims to collect information and analyse it statistically to draw conclusions. For example, let a primary study want to investigate the effects of organizational factors on job satisfaction of employees. Moreover, several organizational factors identified in the literature review are: remuneration, rewards, relation with employers, training, job, engagement, workload, healthy environment at work and, scope of promotion. The hypothesis, in this case, will test the effect of these factors on job satisfaction of employees.

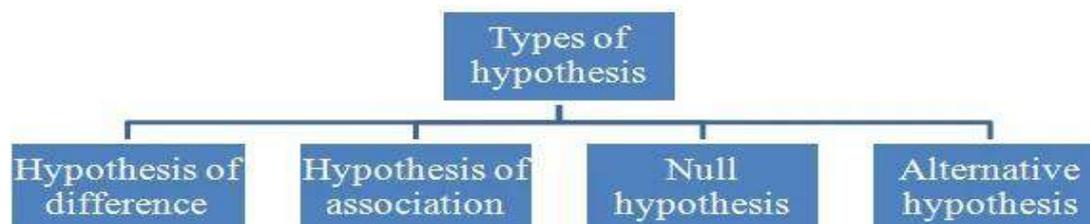
When the research approach is deductive-

A deductive approach of research emphasizes causality and aims test a theory with the help of a hypothesis. Suppose one wants to examine the Economic theory of export-led growth. This theory states that a country can achieve an accelerated rate of growth by relying on the expansion of exports. There are several factors such as foreign direct investment (FDI), trade openness, exchange rate, bilateral and multilateral trade agreements among others that the literature identifies as related to export expansion. In this case, the hypothesis will be framed to determine the effects of these factors on the growth rate.

research method is quantitative-

A quantitative research method is the one that is based on the measurement of variables. It is useful to assess the effect of GDP and the current account deficit of a country on its fiscal deficit. GDP, current account deficit and fiscal deficit all are measured and published in monetary units. The hypothesis, in this case, will be framed to measure the effect of GDP and CAD on the fiscal deficit.

- **Types of hypothesis -**



A hypothesis can be stated in a number of ways. Consider the example research on student performance (grades) in relation to counselling. These are the types of hypotheses that depend on the objective of the study.

- **The hypothesis of difference.** There is a significant difference between the average performance of students who receive counselling and those who do not. The hypothesis of association. There are equal numbers of students in the classroom who receive counselling and who do not receive counselling.
- **Null hypothesis.** There is no relationship between counselling and the grades received by students in the classroom.
- **Alternative hypothesis.** There is a significant relationship between counselling and the grades received by students in the classroom.
- Furthermore, if the research predicts that there is a significant relationship between counselling and student performance. The alternative hypothesis reflects this prediction. The null hypothesis is framed in such a way that it can be refuted to confirm the alternative hypothesis.

Format of a hypothesis

- Consider the example of organizational factors and job satisfaction mentioned above.
- Make a flow chart before framing the hypotheses. This is called a conceptual framework and it helps in framing the hypotheses in a systematic way. In the conceptual framework, list the independent variables or the factors on the left-hand side. The dependent variable 'job satisfaction' should be on the right-hand side. Use an arrow in between. The directionality of the arrow should be from the independent variables to the dependent variable.
- Following the conceptual framework, the independent variables should come on the left-hand side of the hypothesis. The dependent variable should be on the right-hand side of the hypothesis.
- Include words like 'impact', 'influence', 'effect', 'relationship' or 'association' within the hypothesis. This is to indicate what tests can be used in testing it.
- Use notation H_0 to denote the null hypothesis.

- Use notation H_A to denote the alternative hypothesis.
- Following the above rules, the null and the alternative hypotheses in case of the above example are:
- H_0 : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have no effect on the job satisfaction of employees.
- H_A : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have a significant effect on the job satisfaction of employees.

Steps for constructing a hypothesis

- The first step before constructing a hypothesis is a thorough review of existing literature on the topic of research.
- After the literature review, identify gaps in the literature. Then narrow down the research problem to fulfill the gap.
- The research problem needs to be stated in terms of research objectives or research questions.
- Following the research question, identify the dependent and the independent variables.
- Frame statements or hypotheses that reflect a prediction and are testable.
- The results of hypothesis testing directly help to answer the research questions and draw conclusions for the study.

Selecting study area and target population

Selecting study area-

- Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work” deally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives. The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

Target populations-

- Before research can begin the target population must be identified and agreed upon. The target population is the entire population, or group, that a researcher is interested in researching and analysing. A sampling frame is then drawn from this target population. For example, if the research was to identify approximately how many parents read a particular article in their child’s school newsletter, the target population would be all parents of children at that school. The target units would then be the individual parents, and the school could provide a list of parent contact details which would serve as a sampling frame.
- Identifying and collecting relevant secondary data

- **Secondary Data-** Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.
- A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.
- Data classified as secondary for particular research may be said to be primary for another research. This is the case when data is being reused, making it primary data for the first research and secondary data for the second research it is being used for.

Steps of collecting secondary data-

Termine your research question – As indicated above, knowing exactly what you are looking for

Locating data– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.

Evaluating relevance of the data – Considering things like the data’s original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.

Assessing credibility of the data – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.

Analysis – This will generally involve a range of statistical processes as discussed in Chapter 13.

- **Survey schedule and questionnaire**

The research process is incomplete without the collection of data, which starts after the identification of the research problems and chalking out research design.

There are several methods involved in the collection of primary data, like observation, interviews, questionnaires, schedules, etc.

Both questionnaire and schedule are popularly used methods of collecting data in research surveys.

There is much resemblance in the nature of these two methods and this fact has made many people to remark that from a practical point of view, the two methods can be taken to be the same.

But from the technical point of view, there are many differences between the two common methods of data collection.

Similarities between survey and questionnaire-

- Both are set of related items having questions relating to a central problem.
- Both use mainly structured questions and these questions are so phased and interlocked that they have a built-in mechanism for testing the reliability and validity of the response.

- In both the same set of questions is administered to all the respondents and comparable results are obtained.
- Both these instruments have to be used with the same general principles of designs and have to take into account the same problems and basic difficulties they have to be limited in length.
- In both, the central problem has to be concentrated upon the following considerations involved in the problem of evolving the questionnaire and a schedule as a unit.
- Drawing the responding into a situation through awake and interest.
- Proceeding from simple to complex questions.
- No early and sudden request for information of a personal and embracing intimate nature.
- Not asking embarrassing questions without giving the respondent an opportunity to explain himself.
- Moving smoothly from one item to another.
- In both certain types of questions have to be eliminated such as vague and ambiguous questions, emotionally charged questions, loaded and leading questions, questions eliciting no response and questions having a structured response to the queries, violence to the existing facts.
- In both pilot studies and pre-tests are necessary for formulating the instrument and for bringing them to the final form. They have to go through the same stages of development.

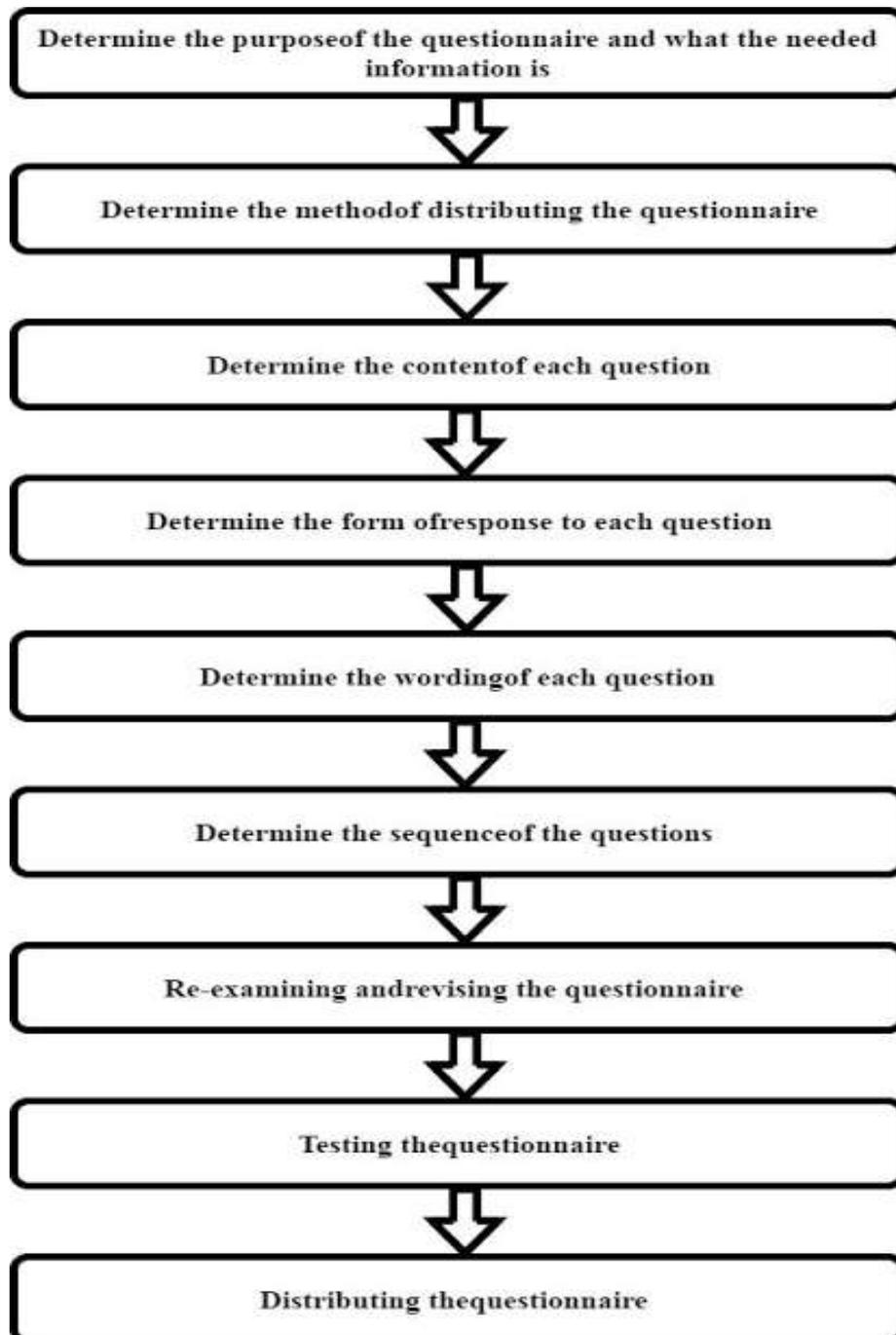
Differences between survey schedule and questionnaire -

The questionnaire refers to a technique of data collection which consists of a series of written questions along with alternative answers.

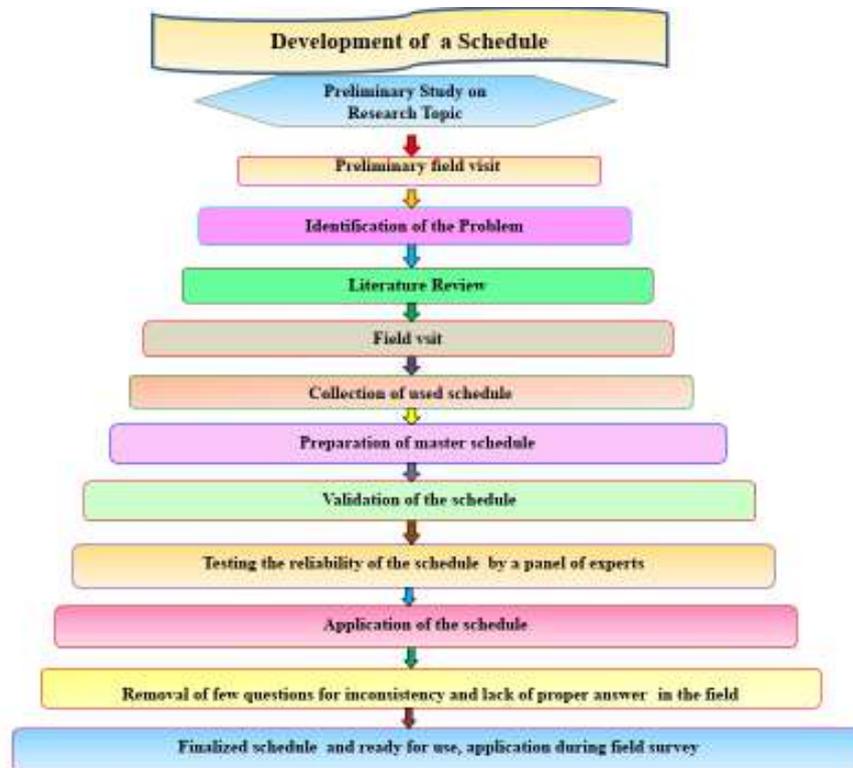
The schedule is a formalized set of questions, statements, and spaces for answers, provided to the enumerators who ask questions to the respondents and note down the answers.

While a questionnaire is filled by the informants themselves, enumerators fill the schedule on behalf of the respondent.

Prepare a questionnaire-



- Prepare a schedule-



ISSUES ON FIELD RESEARCH

PILOT STUDY BASED ON QUESTIONNAIRE

Definition: A pilot study is a preliminary small-scale study that researchers conduct in order to help them decide how best to conduct a large-scale research project. Using a pilot study, a researcher can identify or refine a research question, figure out what methods are best for pursuing it, and estimate how much time and resources will be necessary to complete the larger version, among other things.

Process of Piloting a Survey Questionnaire

- **Selecting the pilot sample:** For large or complex surveys, it is a good idea to do a full pilot before starting actual data collection. To do a pilot a researcher need to test all the survey steps from start to finish with a reasonably large sample. The size of the pilot sample depends on how big the actual sample of the researcher is, and how many data collectors the researcher has. For a typical baseline or end line survey a sample of around 30-50 people is usually enough to identify any major bugs in the system.
- **Implementation of all the steps from start to finish:** The researcher will start by training his data collectors, if he has them. Then the researcher will distribute and collect the survey, after which he will enter the completed surveys into the database that he has planned to use and will test the analysis that he has planned to perform.
- **Making improvements:** Assuming that the survey was pretested, piloting will normally identify practical problems with implementation, rather than problems with the survey design. For example, lack of staff training, challenges with the logistics of distributing and collecting the survey, or errors in data entry. These can then be fixed before the researcher do the actual survey.

Advantages of Conducting a Pilot Study:

Pilot studies are useful for a number of reasons, including:

- Identifying or refining a research question or set of questions
- Identifying or refining a hypothesis or set of hypotheses
- Identifying and evaluating a sample population, research field site, or data set
- Testing research instruments like survey questionnaires, interview, discussion guides, or statistical formulas
- Evaluating and deciding upon research methods
- Identifying and resolving as many potential problems or issues as possible
- Estimating the time and costs required for the project
- Gauging whether the research goals and design are realistic
- Producing preliminary results that can help secure funding and other forms of institutional investment

After conducting a pilot study and taking the steps listed above, a researcher will know what to do in order to proceed in a way that will make the study a success.

ETHNOGRAPHIC FIELD DIARY

Ethnographic data is collected in a variety of ways that involve the researcher being embedded in the field in a variety of ways. Ethnographers collect data by observing in the field. This includes both structured and unstructured observations, along with participant observations. In addition, ethnographers engage in formal and informal interviews and focus groups with subjects. Often researchers will engage in a variety of methods for one research project and this data collection will occur over a period of time. An ethnographer may spend days, months or even year in one **field site** to observe an interview research subject. A field site is the location on the environment an ethnographer is studying. It can be virtually any place- a school, workplace, community, home, street and even in the online world. This **triangulation** of ethnographic methods- using a variety of methods in a field site--- help the researcher to gather as much data as possible to identify trend, patterns and nuances of the field they are studying.

As a result of the intensive data collection method that ethnographers engage, researchers often end up with a good deal of data to analyze. It is therefore important for ethnographers to have a plan on exactly they will collect their data before they head into the field.

LONGITUDINAL STUDY

Definition: A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

Working procedure of Longitudinal Study:

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While

longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Benefits of Longitudinal Study:

A longitudinal study can provide unique insight that might not be possible any other way. This method allows researchers to look at changes over time. Because of this, longitudinal methods are particularly useful when studying development and lifespan issues. Researchers can look at how certain things may change at different points in life and explore some of the reasons why these developmental shifts take place.¹For example, consider longitudinal studies that looked at how identical twins reared together versus those reared apart differ on a variety of variables. Researchers tracked participants from childhood into adulthood to look at how growing up in a different environment influences things such as personality and achievement. Since the participants share the same genetics, it is assumed that any differences are due to environmental factors. Researchers can then look at what the participants have in common versus where they differ to see which characteristics are more strongly influenced by either genetics or experience.

Drawbacks of Longitudinal Study:

- **Longitudinal Studies Can Be Expensive:** Longitudinal studies require enormous amounts of time and are often quite expensive. Because of this, these studies often have only a small group of subjects, which makes it difficult to apply the results to a larger population.
- **Participants Tend to Drop Out Over Time:** Another problem is that participants sometimes drop out of the study, shrinking the sample size and decreasing the amount of data collected. This tendency is known as selective attrition. Participants might drop out for a number of reasons, like moving away from the area, illness, or simply losing the motivation to participate. In some cases, this can influence the results of the longitudinal study. If the final group no longer reflects the original representative sample, attrition can threaten the validity of the experiment. Validity refers to whether or not a test or experiment accurately measures what it claims to measure. If the final group of participants is not a representative sample, it is difficult to generalize the results to the rest of the population.

CASE STUDY RESEARCH

Definition: Case study research is that in which the subject of the research is studied within its social, political, organizational, or economic context and it is one of the commonest approaches across the social and management sciences.

Many authors cite Yin, who describes case study research as:

" ... an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, location no. 638-650).

In other words, the subject of the research is comprehensively studied as an example of a real live phenomenon, within the context in which it happens.

Case Study method used:

According to Yin (2006), case study research is best applied when the research addresses descriptive or explanatory questions: i.e. what happened, how, and why?

It is also good for describing a situation or phenomenon occurring in the present, where in-depth description is useful and where the researcher does not need to manipulate events.

Yin (2003) identifies three types of case studies:

1. Exploratory: the case study is used to define questions and hypotheses – or to test out a research procedure – for a further piece of research, such as a large-scale survey.
2. Descriptive: the case study is used to describe a particular phenomenon within its context. It can be used to expand on a particular theme unearthed by a survey.
3. Explanatory: the case study explores cause-effect relationships, and/or how events happen.

Only the third of these approaches can stand up as a method in its own right, and not as an ancillary to other quantitative approaches such as surveys or field experiments.

Advantages of the Case Study as a Research Method

- a) Case studies are "real" – they offer a chance to get a snapshot of real life: a rich and thick picture. As such, they are most appropriate for dealing with a subject that is context dependent, complex, unusual, or where there is some ambiguity.
- b) In direct contrast to positivist approaches, which seek to generalise, the case study offers particularity: i.e. the opportunity for a holistic approach without the distraction of too many variables .
- c) While it offers depth and specificity, case study research also offers breadth and diversity in terms of methods of data collection and analytical techniques. For example, one case study can incorporate surveys, interviews, direct observation, and archival research. This offers the possibility of several different layers of analysis which can reveal several different perspectives, with the added benefit of triangulation of the results.
- d) According to Woodside (2010, pp. 2-3) the usefulness of case study research lies in the fact that it encourages research methods that help measure thinking over an ongoing period, for example by multiple interviews.
- e) It can also be a useful method when the unit of analysis, or the subject under consideration, is a collective entity such as an organization or a community.

Disadvantages of the Case Study as a Research Method

- a) The most common objection to case study research is that it is insufficiently rigorous. Quite often this criticism relates not to the method as such, but to the way case studies are presented: the author does not leave a clear audit trail detailing his or her research and explaining the conclusions.
- b) Case studies are often seen as a "bolt-on" to a major research project, defining research questions or throwing further light on an issue that has been revealed by a survey. That explanatory research can offer an understanding of a phenomenon is viewed with

skepticism by some, on the grounds that a single case study cannot yield a sufficient volume of evidence on which to generalize.

ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

In order to act on the data collection, a researcher will most likely have to engage with his student population and other stakeholders. When approaching students with data collection requests it is important to be aware of certain ethical considerations.

Ethical considerations refer to the ethical practices of how data is collected, stored or shared. These can include securing clear and informed consent, how to safely store data or how to secure permissions to use or share data. Here are some common ethical considerations that a researcher needs to think through before collecting his data:

Informed Consent: Informed consent refers to written consent by a person to participate in any given evaluation activity where private data and information may be collected. A document is typically prepared that outlines the goals of the evaluation, why data is being collected from whom and how, how it will be stored, for how long and who will have access to it. Facilitators or data collectors are required to ensure that participants understand this information and provide informed consent.

Confidentiality and Anonymity: Confidential data refers to information that is connected to a particular individual but kept confidential such as medical or service records. Anonymous data is information that cannot be traced to a particular individual. Both kinds of data may prove useful, but it is important to ensure that participants know if and how the information they provide is either confidential or anonymous.

Clear Communication and Data Sharing: While it is important to have clear processes for collecting data, it is equally important to have clear processes for sharing data. This is especially true when individual data is private and sensitive such as mental health or addiction related information. It is useful to let participants know that any information gathered is aggregated in the analysis process as a way of ensuring privacy of individual data.

PARTICIPATORY RURAL APPRAISAL

- **Definition**

Participatory rural appraisal (PRA) Or participatory learning and action (PLA) is the fieldworkers use of participatory approach. The PRA continues to evolve so fast that no definitions can be final and has to be updated several times.

PRA is a flexible, low cost and time saving set of approaches and methods used to enable workers to collect and analyse information in terms of past, present and future situations to understand the rural populace and the condition that exists in rural areas which would provide a thorough and comprehensive idea regarding problems, potentials, resources and solutions to formulate realistic development practitioners to achieve the desired goals within specific time (Chambers1992). Participatory approaches like PRA are now becoming a basic approach in rural development and a wide range of examples can be found in the literature for natural resources and communally owned land: resource economics , resource planning, and community forestry. The use of the PRA also brought forth the adaptability of PRA tools and their use in the research process. Locally, participatory processes create the possibility for creating linkages between survival strategies, knowledge systems, knowledge network and sustainable livelihoods (Gupta, 1997).

- **The PLA/PRA approach is used with the following assumptions:**

Rural communities form active foundation for rural development. Communities need committed local leaders to stir up their development

Communities have knowledge and information but it needs to be organized

Communities have resources but they need to be mobilized. They can introduce projects, acting primarily on their own resources.

Community organizations are among the many, which are under utilized resources available for development efforts.

External units such as Government technical experts and extension workers, NGOs, and international organizations often can provide substantial technical, financial or managerial assistance that is critical to rural communities.

Thus, PLA/PRA brings together on the one hand, development needs defined by the community members and on the other, skills of Government, donor agencies and NGOs. It integrates traditional knowledge systems and external technical knowledge in the development process.

- **PRA helps communities to:**

- Mobilize their human and natural resources
- Define problems
- Consider previous successes and failures
- Evaluate priorities and opportunities
- Prepare a systematic and site specific plan of action (CPA)

- **The objectives of the PRA**

- The content included in the PRA are simple and do not require high caliber or mathematical thinking. But require minds which are prepared to accept a new way of learning, a new of doing

things and that we have limited knowledge of something. The ultimate aim of PLA/PRA workshop is:

- To build up a permanent “people first” attitudes in the minds of the participants. To show that “people are capable agents to change their own lives” but require limited out side assistance.
- To establish a notion of “respect” to the people’s knowledge in the life of professionals and their institutions.
- To provide simple analytical tools to analyze rural situations.
- To show some of the analytical tools to the community in the field setting and understand their suitability to farmer situation.
- To enhance participant’s ability to plan with the community.

PRA TECHNIQUES AND METHODS

- The most common methods are the following:
- **Diagramming, Mapping and Modeling:** - transects - maps (resource, social, farm)
- **venn diagrams** - seasonally analysis - historical analysis (time lines, trend lines, activity profiles)
- **Ranking and scoring** - pair wise ranking - matrix ranking - matrix scoring - well-being analysis and wealth ranking - proportional piling –
- **pie charts** (injera charts) Problem analysis - identification and specification - causal chaining - prioritization
- **Maps and Models** – Diagrams

• **APPLICATION AND USES OF PRA**

The PRA is not purely a new method, but is an adoption and development of various other methods/approaches that were developed before it, such as:

- **Andragogy of Education**
- A well-known expert in education from Brazil, Paulo Freire (1971), gave plenty of critics on the education system that was not participative and did not empower the students. He criticized the conventional education and counseling ways—by referring to it as domestication—as a form of imperialism in the education system. This philosophy of participative education in the system of education and counseling is adopted by the PRA method.
- **The Field of Research and Science**
- According to Robert Chambers (1992) there are five main trends that decorate the principle method of PRA:

- **Participatory Action Research**, born from the suggestion of Paulo Freire, stating that the poor can and have the possibility to analyze their own facts and conditions. Recognition of the ability of the village community in analyzing their problems is adopted into PRA;
- **Agro-ecosystem Analysis**, is a combination between system analysis with ownership system by analyzing space, time and the cause-effect relation, relative values and decision making. The methods that were adopted into PRA from this method are the transect technique (locational trace), mapping, seasonal calendar, Venn diagram (inter-party relations) and ranking matrix;
- **Applied Anthropology**, created as an effect of the critics to the science of pure anthropology that emphasize more on the comprehension of the community. Applied Anthropology is intended to judge the ability and validity of village community knowledge and to differ between the soul-frame of the outsider with the insider. What PRA adopts from applied anthropology is that studying outside in the fields is a flexible art and not a science that is rigid, the difference between emic (community norms) and ethic (scientific norms), the validity of indigenous technical knowledge of the village community;
- **Field Research on Farming System**, the focus of attention is in field research participation, because the farmers as the main actors in agriculture are very experienced people that have their own ways to maintain the life of their agricultural system. This method contributes to PRA its yard/garden sketching technique;
- **Rapid Rural Appraisal/PRA**, developed because of a number of reasons. The first being the increase of disappointment against anti-poverty bias as the result of "village development tourism". The bias referred to are: spatial bias (people only come to visit villages that are still close to the city, the main roads and village center, and ignore the borderline villages); project bias (only provide attention and support for villages that are in a project's area); personnel bias (favors men better than women, the elite than the poor, the service users than the non-users, etc.); seasonal bias (preference to visit the villages during the dry season or during harvest time compared to the wet season or time of famine); diplomatic bias (people from the outside do not wish to meet poor people or see appalling conditions that can touch their hearts). All those biases can combine to conceal the worst poverty of all. The second reason is the disappointment of conventional survey methods. For years and in many places, experience has shown that surveys using questionnaire tend to be over-rated, boring and confusing. The data received are often inaccurate. It also takes a long time to report, is boring and difficult to use, which in the end is often abandoned. The third reason is there has been efforts to find a new and better method that is more effective, by empowering the indigenous technical knowledge of the village community as a source of information to analyze and use for the experts from outside.

FOCUS GROUP DISCUSSION

Definition

A focus group discussion involves **gathering people from similar backgrounds or experiences** together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group.

Key Features of FGDs

Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic

Particularly suited for obtaining several perspectives about the same topic

Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation

The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

The researcher needs to be flexible and free of biasness and prejudices.

A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.

Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.

Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not dominate it, and so that those participants who tend not to be highly verbal are able to share their views.

Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.

A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.

Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.

Respondents may be reluctant to share some sensitive ideas and concerns publicly.

Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.

An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

POST FIELD TECHNIQUES: METHODS OF REPORT WRITING

The purpose of a field report in the social sciences is to describe the observation of people, places, and/or events and to analyse that observation data in order to identify and categorize common themes in relation to the research problem underpinning the study. The content represents the researcher's interpretation of meaning found in data that has been gathered during one or more observational events.

Field reports are most often assigned in disciplines of the applied social sciences. It is important to build a bridge of relevancy between the theoretical concepts learned in the classroom and the practice of actually doing the work you are being taught to do. Field reports are also common in certain science disciplines but these reports are organized differently and serve a different purpose than what is described below.

Professors will assign a field report with the intention of improving your understanding of key theoretical concepts by applying methods of careful and structured observation of, and reflection about, people, places, or phenomena existing in their natural settings. Field reports facilitate the development of data collection techniques and observation skills and they help you to understand how theory applies to real world situations. Field reports are also an opportunity to obtain evidence through methods of observing professional practice that contribute to or challenge existing theories.

We are all observers of people, their interactions, places, and events; however, your responsibility when writing a field report is to conduct research based on data generated by the act of designing a specific study, deliberate observation, synthesis of key findings, and interpretation of their meaning.

THINGS NEED FOR REPORT WRITING:

Systematically observe and accurately record the varying aspects of a situation .

Always approach field study with a detailed protocol about what you will observe, where you should conduct your observations, and the method by which you will collect and record your data.

Continuously analyse of observations. Always look for the meaning underlying the actions you observe. Ask yourself: What's going on here? What does this observed activity mean? What else does this relate to? Note that this is an on-going process of reflection and analysis taking place for the duration of your field research.

Keep the report's aims in mind while you are observing. Recording what you observe should not be done randomly or haphazardly; you must be focused and pay attention to details. Enter the observation site [i.e., "field"] with a clear plan about what you are intending to observe and record in relation to the research problem while, at the same time, being prepared to adapt to changing circumstances as they may arise.

Consciously observe, record, and analyse what you hear and see in the context of a theoretical framework. This is what separates data gatherings from reporting. The theoretical framework guiding your field research should determine what, when, and how you observe and act as the foundation from which you interpret your findings in relation to the underlying assumptions embedded in the theoretical framework.

Photography

With the advent of smart phones, an almost unlimited number of high quality photographs can be taken of the objects, events, and people observed during a field study. Photographs can help capture an important moment in time as well as document details about the space where your observation takes place. Taking a photograph can save you time in documenting the details of a space that would otherwise require extensive note taking. However, be aware that flash photography could undermine your ability to observe unobtrusively so assess the lighting in your observation space; if it's too dark, you may need to rely on taking notes. Also, you should reject the idea that photographs represent some sort of "window into the world" because this assumption creates the risk of over-interpreting what they show. As with any product of data gathering, you are the sole instrument of interpretation and meaning-making, not the object itself.

Field note:

There are two primary type of field note:

Descriptive field note:

It provides in depth descriptions and depiction of particular setting and events as well as objectives, activities, behaviours and interactions make up these contexts.

- Description of participants
- Description of setting or context
- Discussion and dialogue
- Accounts of behaviour and activities
- Observers behaviour

2. Reflective field notes:It contain reflective commentary are often focused on the role of the research in relation to the setting and participation, providing the opportunity for resource.

Reflective commentary

Role or stances of the research in relation to the setting and participation

Ethical dilemmas

Methodological challenges and obstacles

revelations and epiphanies

Video and Audio Recordings

Video or audio recording your observations has the positive effect of giving you an unfiltered record of the observation event. It also facilitates repeated analysis of your observations. This can be particularly helpful as you gather additional information or insights during your research. However, these techniques have the negative effect of increasing how intrusive you are as an observer and will often not be practical or even allowed under certain circumstances.

Illustrations/Drawings

This does not refer to an artistic endeavour but, rather, refers to the possible need, for example, to draw a map of the observation setting or illustrating objects in relation to people's behaviour. This can also take the form of rough tables, charts, or graphs documenting the frequency and type of activities observed. These can be subsequently placed in a more readable format when you write your field report. To save time, draft a table [i.e., columns and rows] on a separate piece of paper before an observation if you know you will be entering data in that way.

Participant observation:

Participatory observation is a central data collection approach within anthropology and other fields such as sociology, psychology, and education; it involves either formal or informal information observation of setting, activities, and events such as meeting, performance,

PRA

PRA is a process which extends into analysis, planning and action. The World Bank defines PRA as a 'family of participatory approaches and methods which emphasize local knowledge and enable local people to do their own appraisal, analysis and planning. 'PRA uses group animation and exercises to facilitate information sharing, analysis and action among stakeholders.

the principles of PRA are: 1) 'handing over the stick' which means surrendering authority to local people in the learning processes, 2) ability to conduct critical examination by and of facilitators of their own roles, personal responsibility i.e. 'using one's own best judgment at all times', 3) multi way sharing of ideas and information and 4) stimulation of 'community awareness'

Focus Group Discussion (FGD)

FGD Campbell (2008) defines a FGD as "a planned, facilitated discussion among a small group of stakeholders designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment". It is the method of rapid assessment and data gathering in which participants congregate to talk about the specific issues and concern based on a list of key themes drawn up by the researcher/facilitator. The main objective of focus group discussion is to acquire knowledge regarding the particular issue. It can be used to collectively assemble and analyse information for many purposes such as the adoption of a particular innovation, needs assessment (Tipping, 1998), program evaluation. For conducting a focus group discussion, a facilitator and assistant to facilitator are needed. The facilitator leads the group discussion and encourages the participants. The assistant to the facilitator is to take notes, run the tape recorder, respond to the unexpected interruptions, and is always ready to follow the facilitator's mode of action. Knowledgeable, pleasing personality, politeness, ability to speak local language, respect to local norms and behaviour, ethics, patience etc. are the main criteria of a good facilitator.

Specific objectives of the FGD exercise this exercise was meant specifically to: 1) Understand the group's perceptions of climate change by identifying and ranking some of the main climate change problems presently under debate. 2) Identify and understand the major cause or triggers of the identified problems 3) Identify and understand some of the possible mitigation and adaptation strategy to Climate change. All these were meant to in effect expose the individual as well as groups perception of the present climate change issue under debate with the use of a FGD.

**TECHNIQUES AND FORMULATION OF RURAL
PLANNING THROUGH DATA ANALYSIS**

STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES

Stakeholders:

Stakeholders are persons, groups or institutions with interest in the project or programme. Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively. Secondary stakeholders are the intermediaries in the aid delivery process. This definition of stakeholder includes both winners and losers and those involved or excluded from decision making process. Key stakeholders are those, who can significantly influence or are important to the success of the project (ODA, 1995). This wide definition clearly includes ourselves (researchers) and farmers along with other disciplinary categories such as policy makers, extension officers, relevant government & nongovernmental organisations.

According to ODA (1995) and Allen and Kilvington (2001), there are two types of stakeholders.

Primary stakeholders: They are those who are (will be) ultimately affected either positively (e.g., beneficiaries) or negatively (e.g., those involuntarily resettled). They are immediate communities of interest.

Secondary stakeholders: They are the intermediaries in the aid delivery process. They may include government agencies and other institutional bodies. Often these groups do not consider themselves as stakeholders because they feel they own the process.

There is another party called the **Tertiary Stakeholders**. This group consists of those individuals or organizations that do not have any particular 'stake' in the initiative. However, their activities affect the project's functioning and outcome.

What Is Stakeholder Analysis?

A "stakeholder" can be defined as: Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

According to ODA (1995), stakeholder analysis is a tool by which the key stakeholders of a project are identified, their interest in the project is assessed and the ways in which are interest affects project riskiness and viabilities are judged.

Although stakeholder analysis finds its origin to business and managerial science, it is currently used in fields ranging from political science to policy development and international relations (Chevalier, 2001). The concept and related methodology have made significant inroads to poverty reduction studies and applied research pertaining to issues of sustainable livelihood, community based natural resource and conflict management (Ramirez, 1999).

Applications of Stake holder Analysis (SA):

Although SA can be usefully applied to a wide range of policy and management contexts. It is more relevant in complex situations where there are compatibility problems between objectives and stake holders. It is suggested that SA is particularly relevant to natural resource issues where they are characterized by:

Cross cutting systems and stake holder interests

- Multiple users and users of the resources
- Multiple objectives and concerns
- Temporal trade-offs
- Poverty and under representation
- Market failure

Steps in Stakeholder Analysis:

There are eight major steps in the process:

Planning the process: The first step in conducting a stakeholder analysis is to define the purpose of the analysis, identify the potential users of the information, and devise a plan for using the information. A discussion of these issues should be led by the “sponsor,” or initiator, of the stakeholder analysis.

Selecting and defining a policy: For a stakeholder analysis to be useful, it must be focused on a specific policy or issue. Again, policy is used in this document to refer to any national, regional, local, or institutional project, program, law, regulation, or rule. In most cases, the sponsor of the stakeholder analysis will have identified a policy, but it is important to ensure that the policy in question is an appropriate topic for a stakeholder analysis before the process begins.

Identifying key stakeholders: Identifying the key stakeholders is extremely important to the success of the analysis. Based on the resources available, the working group should decide on the maximum number of stakeholders to be interviewed.

Adapting the tools: Generally, very little secondary information is available on stakeholders. As a result, the working group should plan to interview the priority stakeholders identified to gain accurate information on their positions, interests, and ability to affect the process.

Collecting and recording the information: Before beginning the interviews, the working group should gather and review secondary information on the priority stakeholders. It should include any statements regarding the stakeholders’ positions on the policy, any goals or objectives of the organizations the stakeholders represent.

Filling in the stakeholder table: This step of the process involves taking detailed and often lengthy answers from the interviews and arranging them into a more concise and systematized format.

Analyzing the stakeholder table: Once the stakeholder table is complete, the information needs to be "analysed." Such an analysis should focus on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests, positions, and possible allies regarding the policy in question.

Using the information: Using the information generated by the preceding analysis is an integral part of the stakeholder analysis process.

Benefits/Advantages of stakeholder analysis:

- Identity stakeholders with conflicting interest and provide opportunity for finely adoption of conflict resolution strategies.
- The opinions and views of powerful and influential stakeholders serve as valuable inputs.
- The support and co-ordination of stakeholders are ensured.
- Ensure resource mobilization (both in terms of financial and non-financial).
- Help to identify relations between stakeholders who can be built upon and may enable 'Coalition' of project sponsorship, our-ship and co-operation.
- Identify stakeholders who are sources of risk as threat to the project.
- Identify stakeholders who need empowerment through capacity building or institutional building.
- Help to assess the appropriate type of participation by different stakeholders at successive stage of the project cycle.
- Help to avoid allocation of time and resources to unnecessary individuals or organizations.

Limitations of SA:

1. Though a powerful tool for problem analysis and illuminating the interests of underrepresented, it cannot in itself provide answers to problems.
2. SA, mirrors the groupings and interest of society and in itself does not try to make changes.
3. The process of analysis cannot be extended for examining the role of very large number of stake holders.
4. Cannot be tried to quantify stake holders' likely gains and losses, this is inherently qualitative tool and can best be employed as an illustrative aid to decision making.

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OR ANY SECTOR

A SWOT analysis makes it possible to assess the various strengths, weaknesses, opportunities and threats (SWOTs) within an organization or within the agricultural extension system as a whole. This factsheet examines the four elements of SWOT and the process of conducting an analysis. It provides tips for conducting the analysis and a ready-to-use SWOT analysis template. The factsheet concludes by looking at scenarios when a SWOT analysis is most appropriate, as well as its advantages and disadvantages.

The SWOT framework:

A SWOT analysis process generates information that is helpful in matching an organisation or group's goals, programs, and capacities to the environment in which it operates. The 'SWOT' itself is only a data capture exercise - the analysis follows later.

Strengths: positive tangible and intangible attributes, internal to an organisation and within the organisation's control.

Weaknesses: internal factors within an organisation's control that detract from the organisation's ability to attain the desired goal. Which areas might the organisation improve? **Opportunities:** external attractive factors that represent the reason for an organisation to exist and develop. What opportunities exist in the environment, which will propel the organisation? Identify them by their 'time frames'.

Threats: external factors beyond the organisation's control which could place the organisation mission or operation at risk. The organisation may benefit by having contingency plans to address them if they should occur. Classify them by their severity and probability of occurrence

The SWOT analysis tips:

- Some useful tips for carrying out a SWOT analysis:
- Collaborate - an analysis that involves multiple perspectives will deliver a better outcome.
- Use expertise and resources that are already available within the organisation.
- Use SWOT analysis in conjunction with other techniques, such as PESTLE analysis.
- Incorporate the analysis into an ongoing process for monitoring changes in the business environment.
- Try not to get bogged down collecting vast amounts of detailed information without analysing and understanding your findings appropriately.
- Don't jump to conclusions about the future based on the past or present.

to use a SWOT analysis:

A SWOT analysis can be used for:

- Workshop sessions.

- Generating ideas and solutions.
- Problem solving.
- Planning.
- Strategic planning (with PESTLE).
- Product evaluation.
- Competitor evaluation (with Porter's five forces).
- Personal development planning.
- Decision making (with Lewin's force field analysis).
- For example, using SWOT in a team meeting might include the following steps:
 - Invite contributors to participate in the SWOT process.
 - Explain the process and establish ground rules.
 - Identify strengths.
 - Identify weaknesses.
 - Identify or list the opportunities and threats – this may well have been identified from a PESTLE analysis previously.
 - Establish priorities – from your mission, vision and values work.
 - Question each list.

Advantages and Disadvantages of using SWOT analysis:

- There are a number of advantages and disadvantages of using the SWOT approach to analysis. Advantages include:
 - It's a simple four box framework.
 - It facilitates an understanding of the strengths and weaknesses of the organisation.
 - It encourages the development of strategic thinking.
 - It enables senior managers to focus on strengths and build opportunities.
 - It can enable an organisation to anticipate future business threats and take action to avoid or minimise their impact.
 - It can enable an organisation to spot business opportunities and exploit them fully. It's flexible.
- Disadvantages include:
 - Some SWOT analysis users oversimplify the amount of data used for decisions – it's easy to use insufficient data.
 - The risk of capturing too much data may lead to 'paralysis by analysis'.
 - The data used may be based on assumptions that later prove to be unfounded.
 - Access to quality internal data sources can be time consuming and politically difficult (especially in more complex organisations – parent company, etc).
 - It lacks detailed structure, so key elements may get missed.
 - The pace of change makes it increasingly difficult to anticipate developments that may affect an organisation in the future.
 - To be effective, the process needs to be repeated on a regular basis.

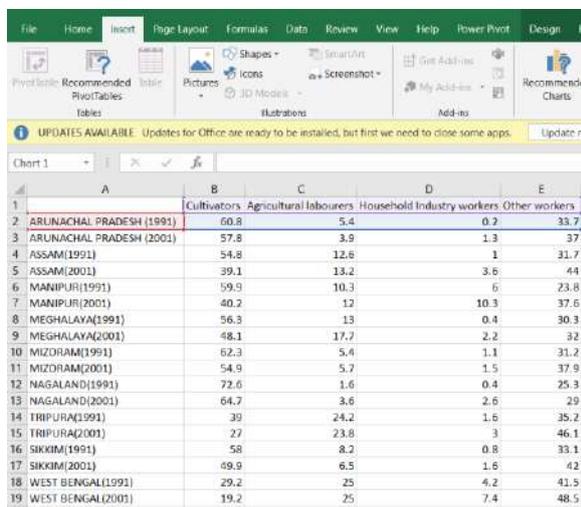
Occupational Structure

What is Occupational Structure?

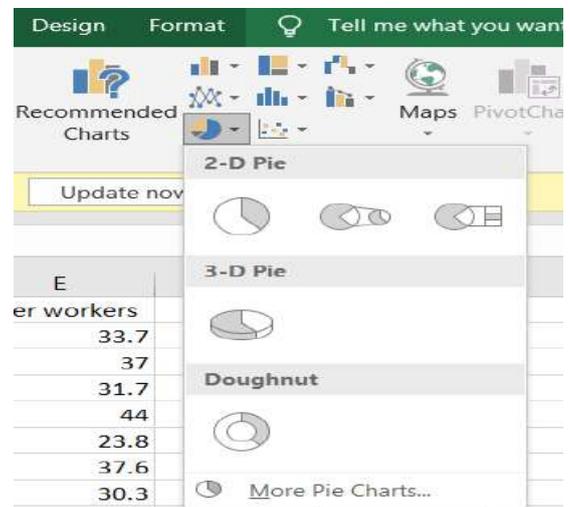
The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a country who are employed in different sectors like agriculture, manufacturing and transport, among many others constitute the occupational structure of a nation.

Steps for occupational structure:

1. At first add the data on excel sheet.
2. Now select the data according to your choice → go to Insert → select recommended charts and click 3a-D Pie → ok.

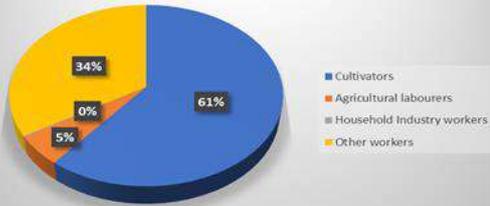


	A	B	C	D	E
1		Cultivators	Agricultural labourers	Household Industry workers	Other workers
2	ARUNACHAL PRADESH (1991)	60.8	5.4	0.2	33.7
3	ARUNACHAL PRADESH (2001)	57.8	3.9	1.3	37
4	ASSAM(1991)	54.8	12.6	1	31.7
5	ASSAM(2001)	39.1	13.2	3.6	44
6	MANIPUR(1991)	59.9	10.3	6	23.8
7	MANIPUR(2001)	40.2	12	10.3	37.6
8	MEGHALAYA(1991)	56.3	13	0.4	30.3
9	MEGHALAYA(2001)	48.1	17.7	2.2	32
10	MIZORAM(1991)	62.3	5.4	1.1	31.2
11	MIZORAM(2001)	54.9	5.7	1.5	37.9
12	NAGALAND(1991)	72.6	1.6	0.4	25.3
13	NAGALAND(2001)	64.7	3.6	2.6	29
14	TRIPURA(1991)	39	24.2	1.6	35.2
15	TRIPURA(2001)	27	23.8	3	46.1
16	SIKKIM(1991)	58	8.2	0.8	33.1
17	SIKKIM(2001)	69.9	6.5	1.6	42
18	WEST BENGAL(1991)	29.2	25	4.2	41.5
19	WEST BENGAL(2001)	19.2	25	7.4	48.5

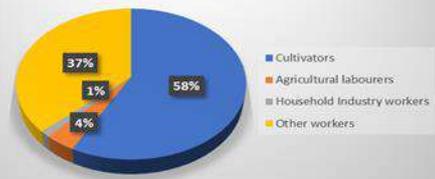


3. After that select the pie diagram → then copy and paste the diagram and merge → save as image → ok.

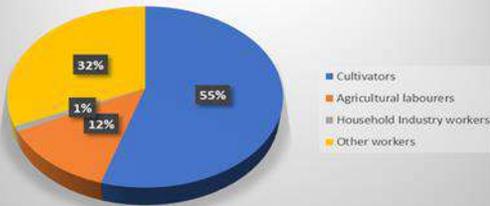
ARUNACHAL PRADESH (1991)



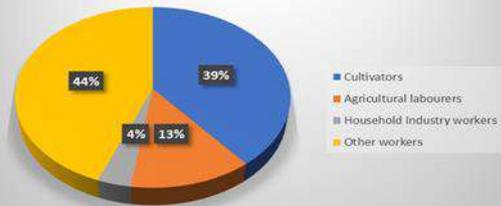
ARUNACHAL PRADESH (2001)



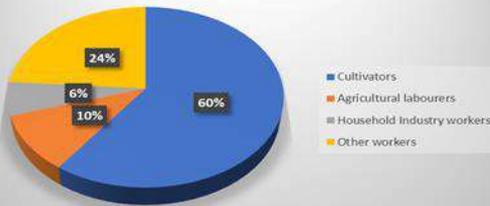
ASSAM(1991)



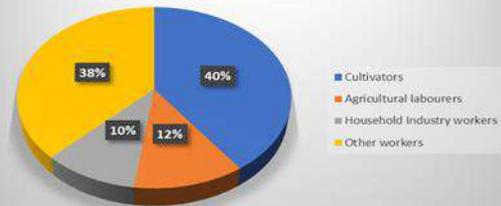
ASSAM(2001)



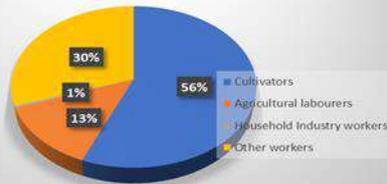
MANIPUR(1991)



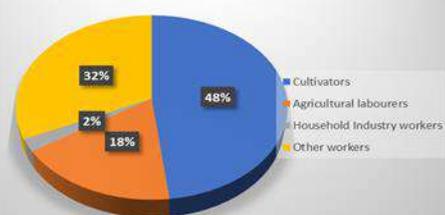
MANIPUR(2001)

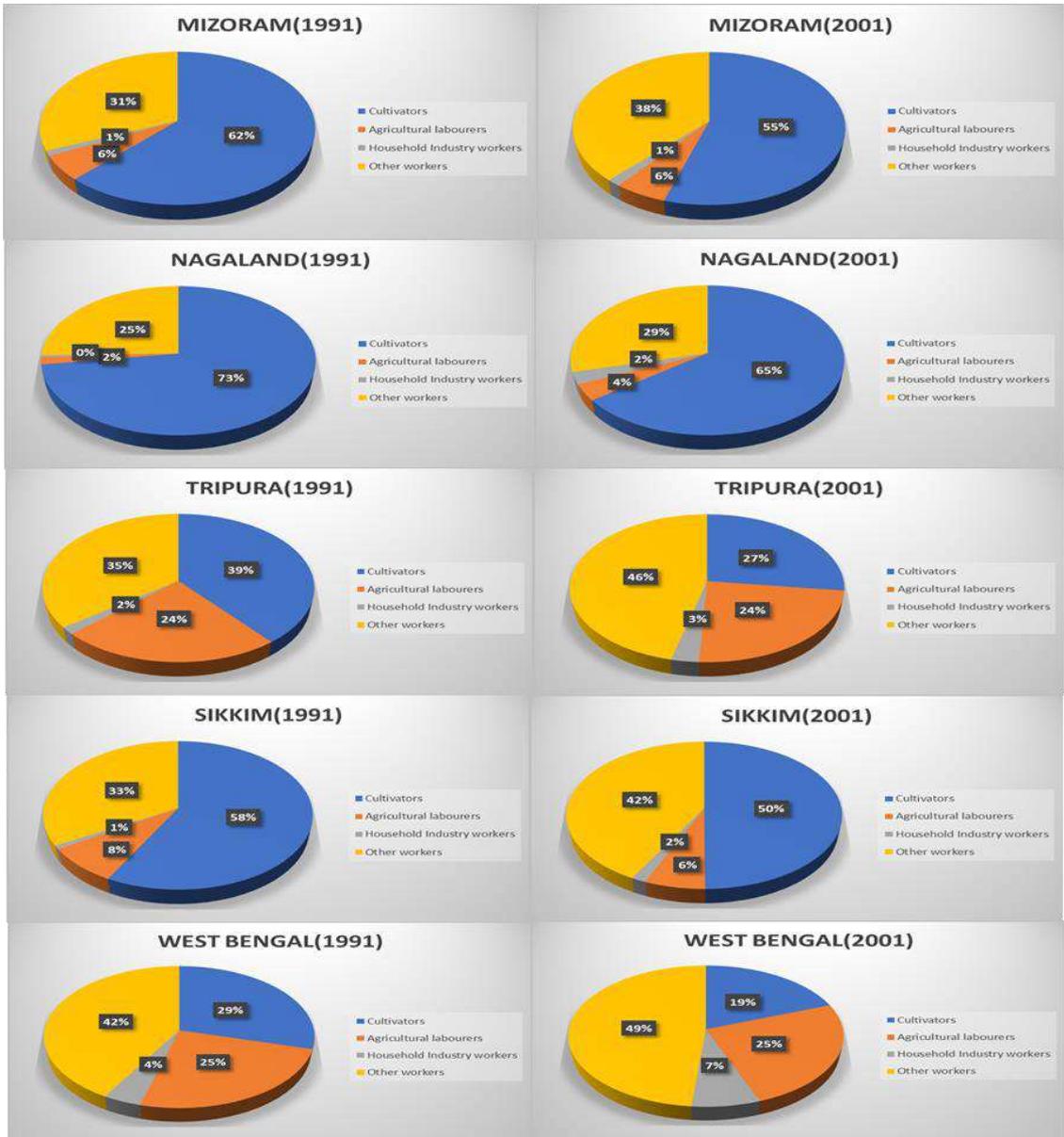


MEGHALAYA(1991)



MEGHALAYA(2001)





DEFINITION OF AGE SEX PYRAMID

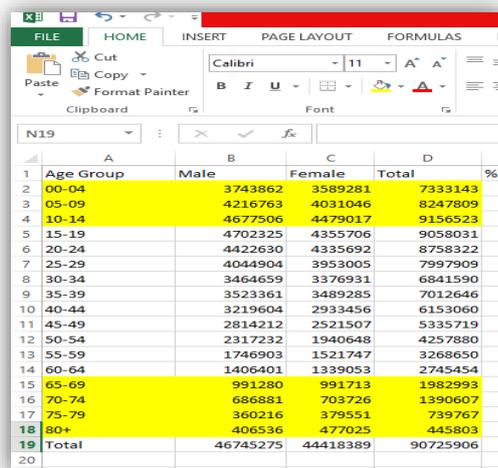
A population **pyramid** or " **age-sex pyramid** " is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically forms the shape of a pyramid when the population is growing.

HOW TO CREATE AGE SEX PYRAMID

STEPS –

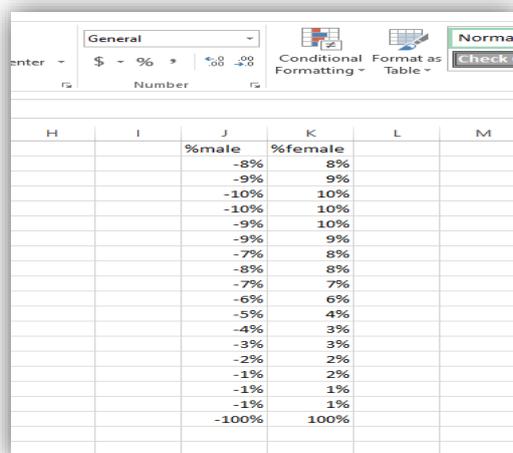
1 . First add the data on excel sheet

2.calculate the % of the male and female population from the data



The screenshot shows an Excel spreadsheet with the following data:

Age Group	Male	Female	Total	%
00-04	3743862	3589281	7333143	
05-09	4216763	4031046	8247809	
10-14	4677506	4479017	9156523	
15-19	4702325	4355706	9058031	
20-24	4422630	4335692	8758322	
25-29	4044904	3953005	7997909	
30-34	3464659	3376931	6841590	
35-39	3523361	3489285	7012646	
40-44	3219604	2933456	6153060	
45-49	2814212	2521507	5335719	
50-54	2317232	1940648	4257880	
55-59	1746903	1521747	3268650	
60-64	1406401	1339053	2745454	
65-69	991280	991713	1982993	
70-74	686881	703726	1390607	
75-79	360216	379551	739767	
80+	406536	477025	445803	
Total	46745275	44418389	90725906	



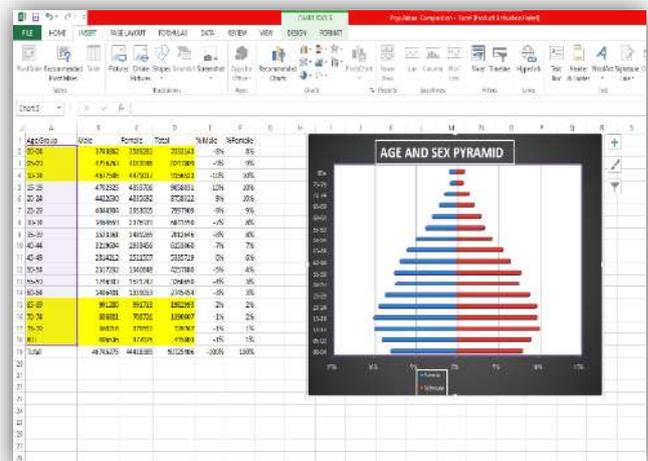
The screenshot shows an Excel spreadsheet with the following data:

	%male	%female
-8%	8%	
-9%	9%	
-10%	10%	
-10%	10%	
-9%	10%	
-9%	9%	
-7%	8%	
-8%	8%	
-7%	7%	
-6%	6%	
-5%	4%	
-4%	3%	
-3%	3%	
-2%	2%	
-1%	2%	
-1%	1%	
-1%	1%	
-100%	100%	

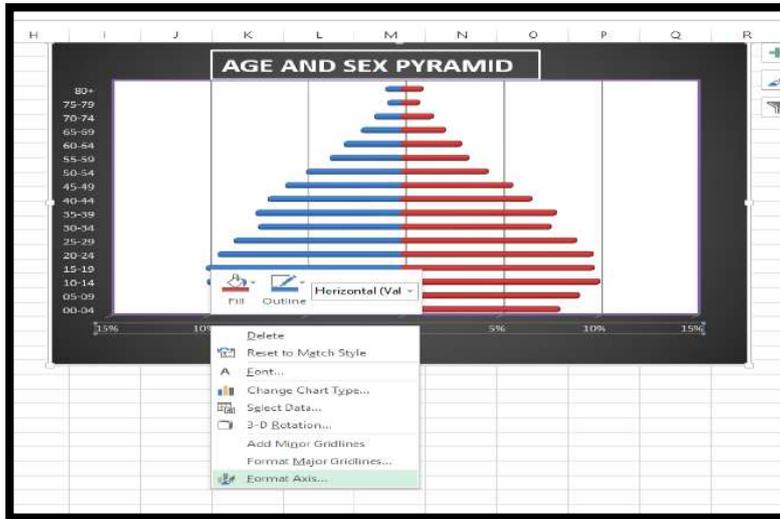
After Calculating the % of the male and female population from the data select the age group with both male and female % population

Age Group	Male	Female	Total	% Male	%Female	%male	%female
00-04	3743862	3589281	7333143	-8%	8%	-9%	8%
05-09	4216763	4031046	8247809	-9%	9%	-10%	9%
10-14	4677506	4479017	9156523	-10%	10%	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%	-9%	10%
20-24	4422630	4335692	8758322	-9%	10%	-9%	10%
25-29	4044904	3933005	7997909	-9%	9%	-7%	8%
30-34	3464659	3376931	6841590	-8%	8%	-7%	8%
35-39	3523361	3489285	7012646	-7%	7%	-6%	6%
40-44	3219604	2933456	6153060	-6%	6%	-5%	4%
45-49	2814212	2521507	5335719	-4%	3%	-3%	3%
50-54	2317232	1940648	4257880	-3%	3%	-2%	2%
55-59	1746903	1521747	3268650	-2%	2%	-1%	1%
60-64	1406401	1339053	2745454	-1%	1%	-1%	1%
65-69	991280	991713	1982993	-1%	1%	-1%	1%
70-74	686881	703726	1390607	-1%	1%	-1%	1%
75-79	360216	379551	739767	-1%	1%	-1%	1%
80+	406536	477025	883561	-1%	1%	-1%	1%
Total	46745275	44418389	90725906	-100%	100%	-100%	100%

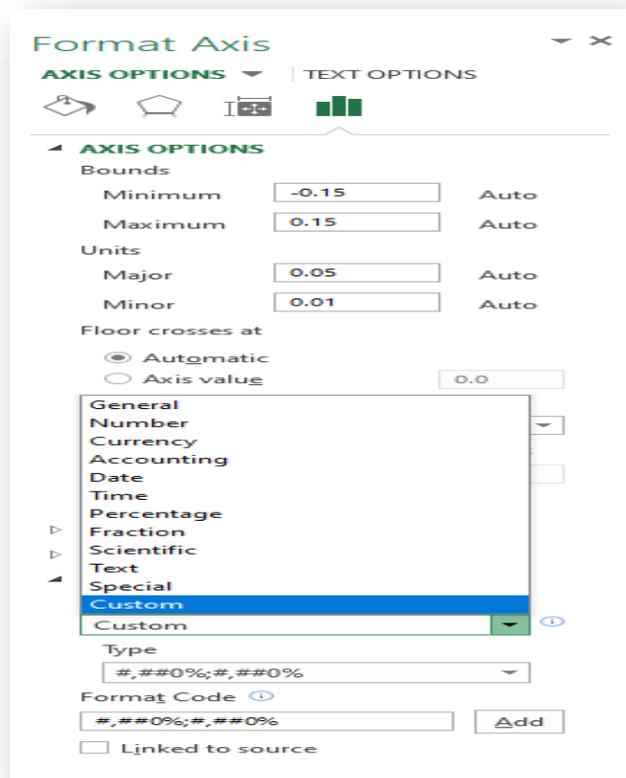
Then go to insert select a suitable bar



1. After your age and sex pyramid was appear thn you have to remove [-] Portion from the horizontal plane --- right click on it ----then format axis.

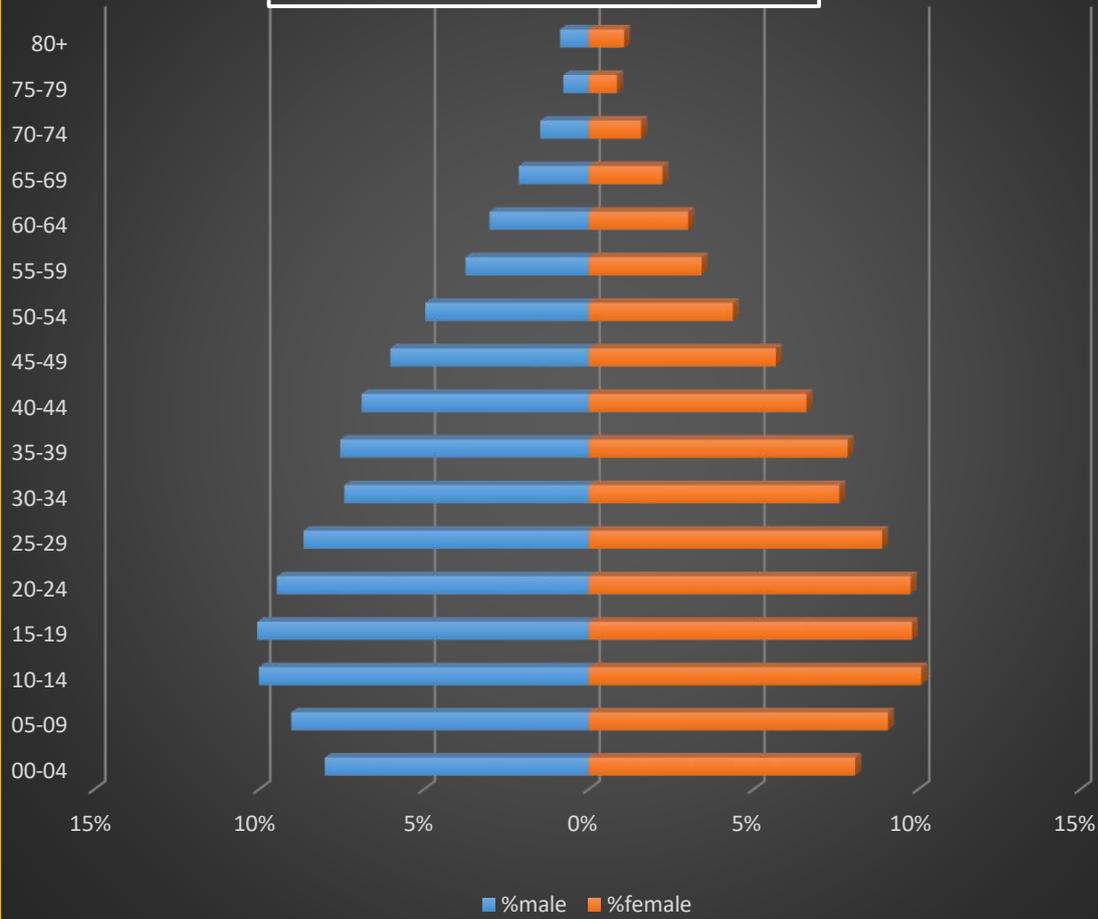


Then this type of tool box was open > go to number> click on customs



1. than this type of tool box was open > go to number> click on customs

AGE AND SEX PYRAMID



MIGRATION

Migration is the progress of people from one place to another, to establish their permanent or semi-permanent residence at the destination. Immigration is an essential component of change, structure, and population growth, as are birth rates and mortality. There are attraction factors and pushing factors in one place, which influence a person's decision to move. The first are those that attract people to stay, such as low crime rates, pleasant weather, political stability, and excellent employment opportunities. Push factors encourage people to leave the place, such as poverty, war, and floods. [Migration] is usually voluntary, but there are many specific reasons why a person can do it. Sometimes it is forced. Immigration has been a widespread phenomenon throughout the history of humanity; However, nomadic movements are non-migratory, since their purpose is not to settle permanently or semi-permanently in one place. Nor are tourist trips, pilgrimages, and other actions that do not have this end.

Causes

The causes vary, from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area. The roots of [migration] are the following:

- **Economic Seek** employment, start or continue a career, in particular, take advantage of the economic benefits of a specific country, and so on.
- **Social** stay close or live with the family, seek a better quality of lifestyle, and so on.
- **Policies** from persecutions, wars, and other types of problems or political conflicts that put lives at risk.
- **Cultural** improve the quality of education, seek religious affinity or tolerance, taste for the culture of the country, and so on.
- **Environmental Escape** from natural disasters, find a place with a more pleasant climate, and so on.

TYPES OF MIGRATION

1. Internal migration :

Internal migration is a migration that takes place within the borders of a country or territory;

External or internationale migration :

migration is international when it refers to changes in habitual residence between countries ;

3. "lifetime" migration:

The "lifetime" migration is defined by relating the place of birth and the place of residence to a reference date. The migrant "life-time" is any individual who resides in an administrative entity other than his or her place of birth.

4. Migratoire flows :

Migration flows refer to movements (in and out) of population (nationals and foreigners) that occur at the borders of a given country ;

5.Stock of migrants :

Migrant stocks are referred to as the number of migrants (immigrants and emigrants) residing in a country with a certain length of stay, irrespective of the socioeconomic characteristics (migrant workers, refugees, students, etc.) of migrants ;

Diaspora :

- A diaspora is defined both as the dispersion of a people in foreign countries and the formation of a community of that people in those countries ;
- **clandestine/irregular migration :**
- There is "clandestine migration" when an foreigner enters a country without respecting the entry conditions or has entered illegally, remains there beyond the time allowed by law.

LAND USE AND LAND COVER MAPS

The terms land use and land cover are often used interchangeably, but each term has its own unique meaning. Land cover refers to the surface cover on the ground like vegetation, urban infrastructure, water, bare soil etc. Identification of land cover establishes the baseline information for activities like thematic mapping and change detection analysis. Land use refers to the purpose the land serves, for example, recreation, wildlife habitat, or agriculture.

When used together with the phrase Land Use / Land Cover (LULC) generally refers to the categorization or classification of human activities and natural elements on the landscape within a specific time frame based on established scientific and statistical methods of analysis of appropriate source materials. Land cover is the physical material at the surface of the earth. Land use is the description of how people utilize the land for the socio-economic activities.

Reason to use Land use and Land cover maps :-

- LULC maps play a significant and prime role in **planning, management and monitoring programmes** at local, regional and national levels. This type of information, on one hand, provides a better understanding of **land utilization aspects** and on the other hand, it plays an important role in **the formation of policies and programme required for development planning**.
- For ensuring sustainable development, it is necessary to **monitor the on going process on land use/land cover** pattern over a period of time.
- **In order to achieve sustainable urban development** and to **check the haphazard development** of towns and cities, it is necessary that authorities associated with the urban development generate such planning models so that every bit of available land can be used in most rational and optimal way.
- LULC maps also help us to **study the changes** that are happening in our ecosystem and environment and **we can make policies and launch programmes to save our environment**.

LULC classification :-

LULC classification is one of the most widely used applications in remote sensing. The most commonly used approaches include :

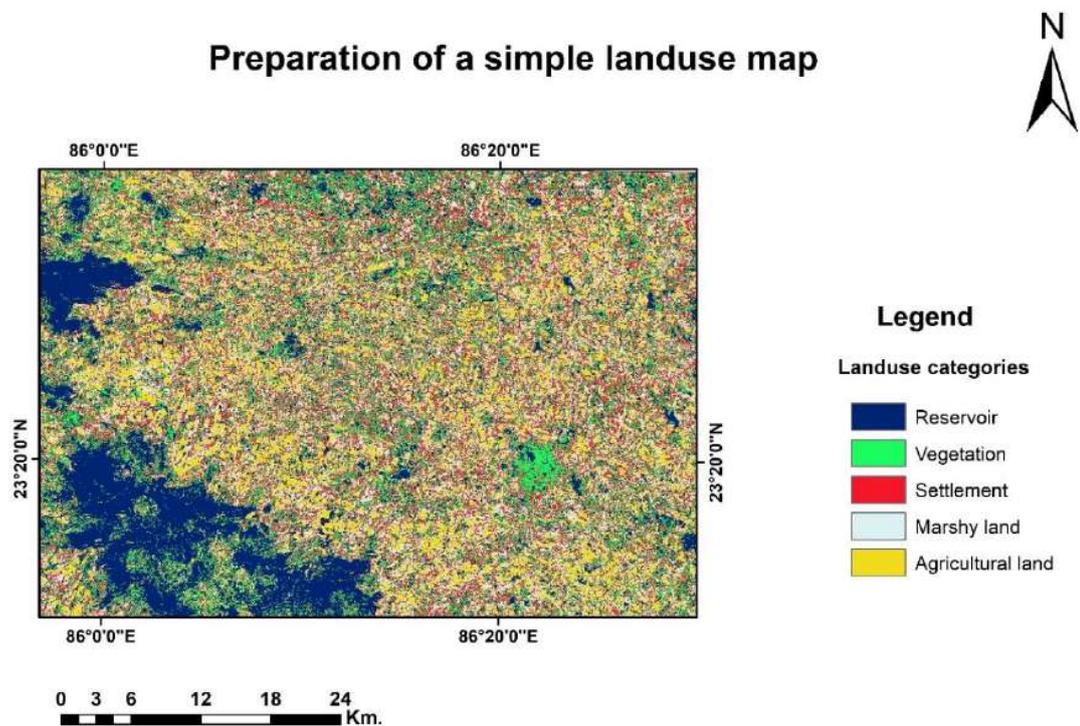
Unsupervised classification, Supervised classification, Image segmentation, NDVI

Applications of LULC maps :-

- Natural resource management
- Wildlife habitat protection
- Baseline mapping for GIS input
- Urban expansion / encroachment
- Routing and logistics planning for seismic / exploration/resource extraction activities
- Damage delineation (tornadoes, flooding, volcanic, seismic, fire)
- Legal boundaries for tax and property evaluation. Target detection - identification of landing strips, roads, clearings, bridges, land/water interface.

Steps to create Land use and Land cover Maps :-

Data downloading → Downloading vector data → Downloading ESA Global land cover dataset → Data pre-processing → loading vector data into QGIS → Extracting shape file for chosen area → Adding ESA land cover data to QGIS → clipping ESA Global land cover dataset → Data preparation → Install SCP Plugin in QGIS → QGIS Install Plugin Window → SCP Dock → Import Data → Select Directory SCP Plugin → Creating a Bandset → SCP Bandset Page → SCP Plugin Bandset window with the single band list loaded → Pixel information for each band → Area image before changing band rendering → Create training input → Create classes → Change Band Rendering → Create ROIs → Assess ROIs → Spectral Signature Plot → Run classification → Ground cover classification → SCP land cover change outputs → Layer Properties, Symbology → Land cover change output map



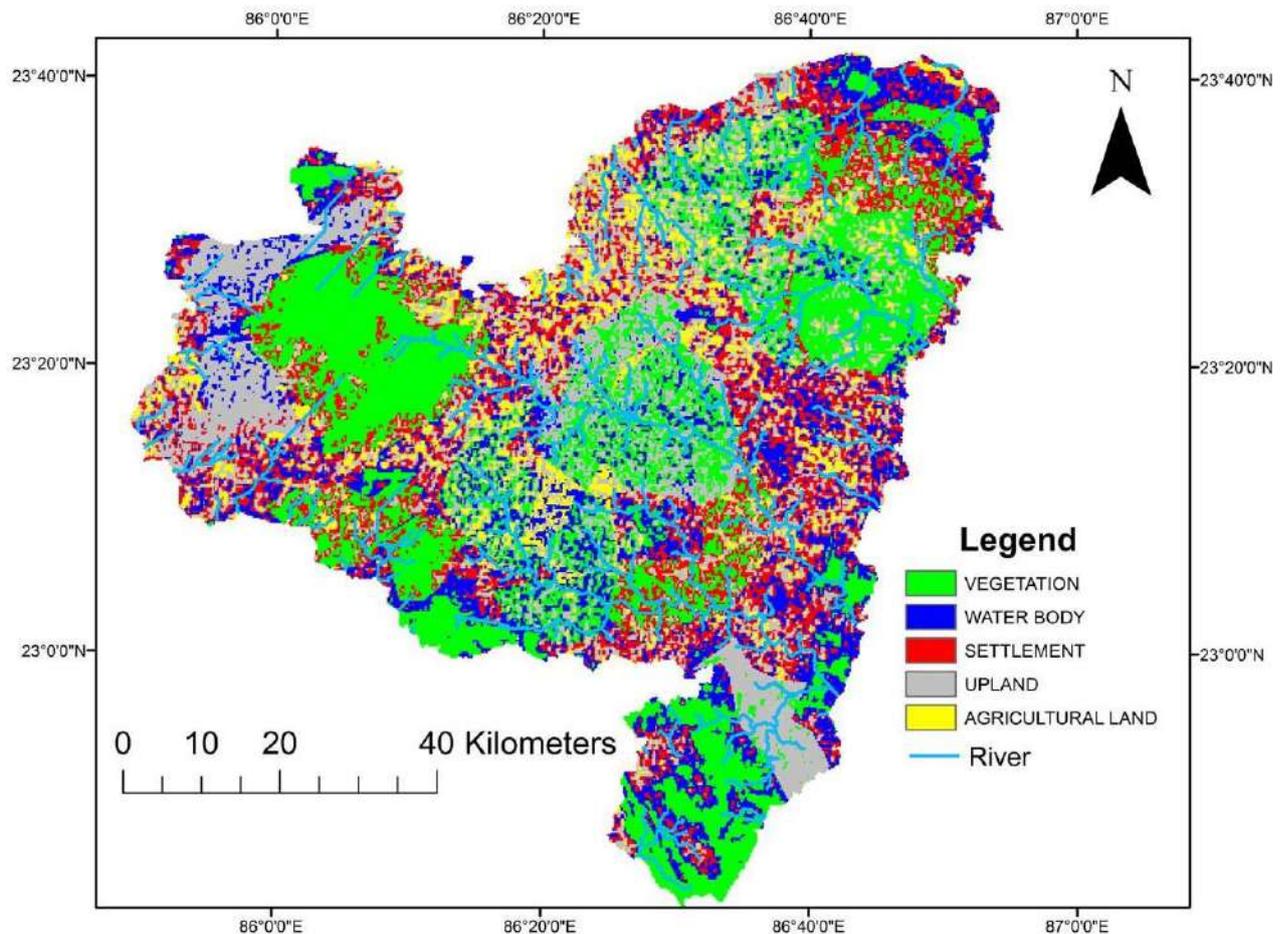
Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation :-

Here in this land use map, there is a reservoir in the north-east side of the area, which is indicated by blue. We can notice, most of this area is covered by agricultural land, which is highlighted by yellow. There are some vegetation in this area which is covered with green. In this area we can see settlement with medium density as red colour. There are marshy land which is noticed very often and this is noticed as grey colour.

We can get a land use and land cover map of Purulia district.

LANDUSE MAP OF PURULIA DISTRICT (2019)

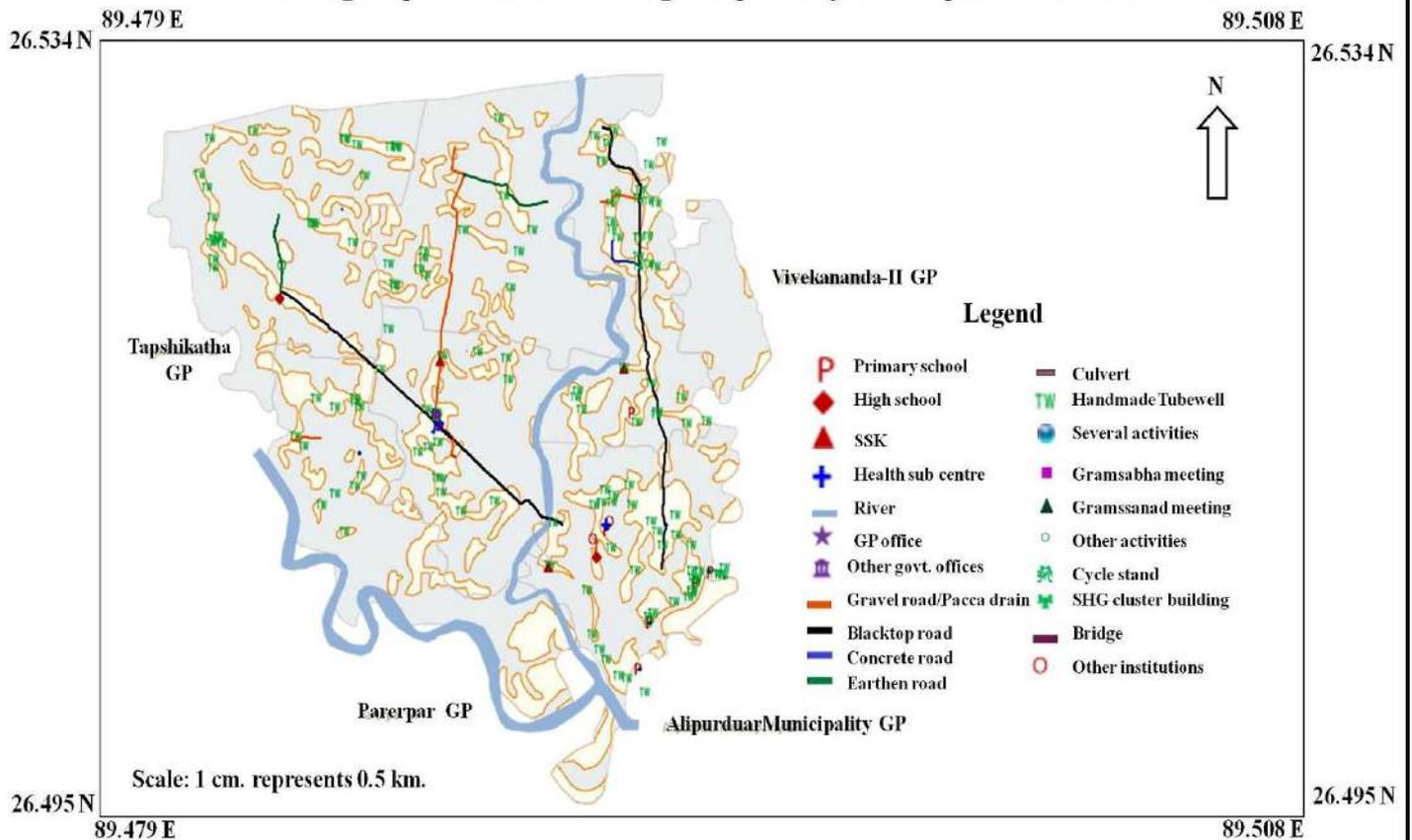


Interpretation :-

In this land use map, there are vegetation in northern part and also in east and north-east, middle side of Purulia, which is high in density and indicated as green. We can noticed reticulated river which is flow from north to east and also some tributary river in the northern side of Purulia district, the river is mentioned by sky blue. There are agricultural land in all over the area of this locality and is highlighted by yellow. In the northern side and eastern side there are upland which is mentioned as grey. There are dense settlement pattern all over the area of Purulia district, this is highlighted in red colour. There are thick water body in north

and east part of the area and also some water body can noticed all over the area of this map. The water body is indicated by deep blue.

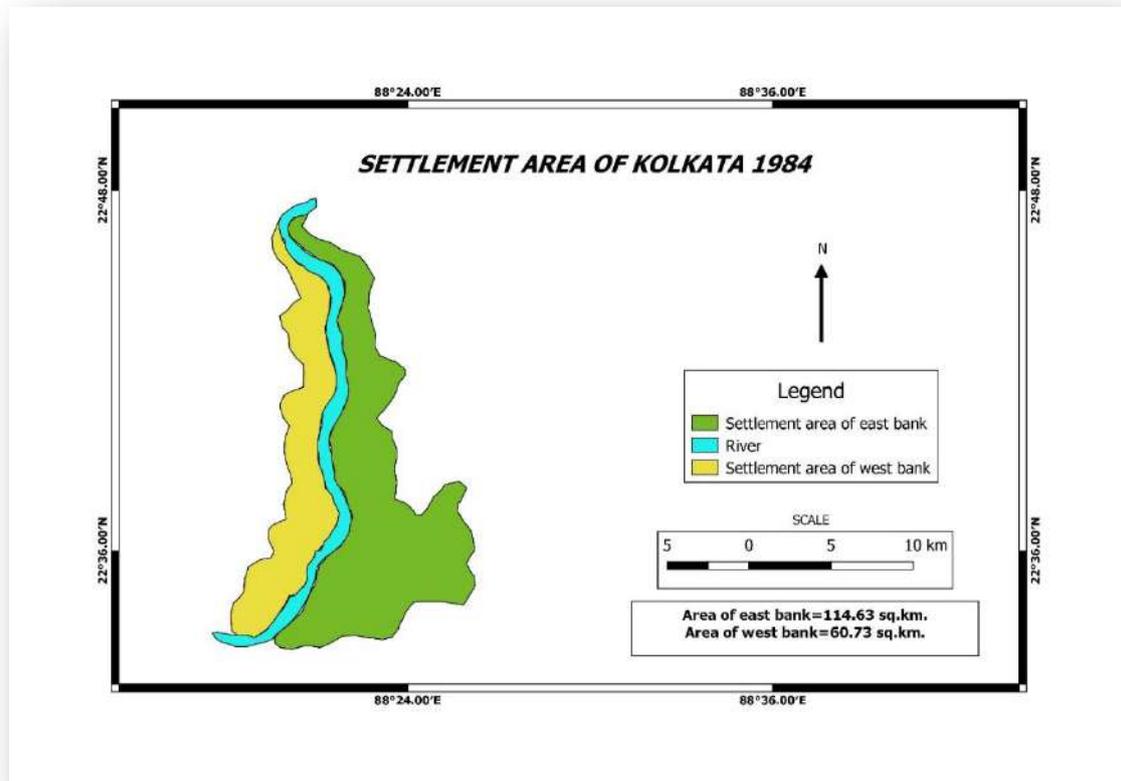
Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation :-

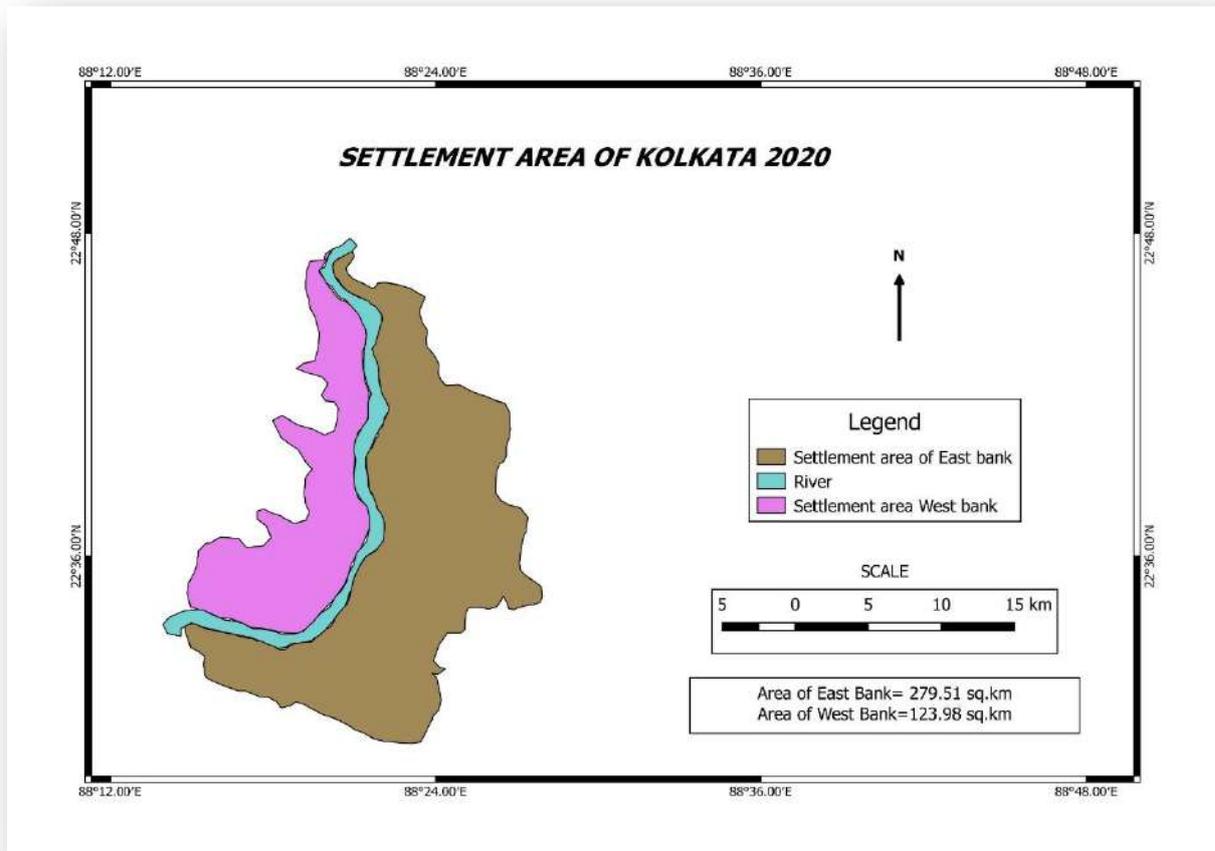
In this planning map of Banchukumari gram panchayet of Alipurduar, we can see a river running from north to east and a tributary river is joined from north-east side of the area. There are four primary school in the east corner. Also there are two high schools and two SSK, health centre, GP office, other government office in the same direction. So we can say that many of these official buildings, education and health sector is located in the east corner of this area. In this block there have pacca drain and gravel road in the middle portion of the area. There are two blacktop road in the middle and east part of this block. Each locality have there own handmade tubewell. There are concrete road in the north and north-east side of this block.

Mapping of human habitation and detection of changes from multi dated maps/ images



Interpretation:

In this image it is shown the settlement area of Kolkata 1984. In this image we can see that the growth of settlement area of two side of Ganga river in 1984. In 1984 the settlement area of east bank is spreads in 114.63 sq. km, which is highlighted by green. The settlement area of west bank of Ganga river is spreads in 60.73 sq.km , which is highlighted in yellow. In this image we can clearly see that settlement area in west bank was not that much spreads.



Interpretation:

In this image it is shown the settlement area of Kolkata 2020. In this image we can see that the growth of settlement area of two side of Ganga river in 2020. In 2020 the settlement area of east bank is spreads in 279.51 sq. km, which is highlighted by grey. The settlement area of west bank of Ganga river is spreads in 123.98 sq.km, which is highlighted by pink.

After comparing 1984 and 2020 image we can clearly see the growth of settlement area in two side of Ganga river.

GEOPDSE04P:B . REGIONAL
PLANNING AND RURAL
DEVELOPMENT

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RESEARCH

Research is a logical and systematic search for new and useful information on a particular topic. Research is important both in scientific and nonscientific fields. In our life new problems, events, phenomena, and processes occur every day. Practically, implementable solutions and suggestions are required for tackling new problems that arise. Scientists have to undertake research on them and find their causes, solutions, explanations, and applications. It is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words, research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods. The research is broadly classified into two main classes:

- _ Fundamental or basic research , and
- _ Applied research.

Basic and applied research are generally of two kinds: normal research and revolutionary research. In any particular field, normal research is performed in accordance with a set of rules, concepts and procedures called a paradigm, which is well accepted by the scientists working in that field. In addition, the basic and applied research can be quantitative or qualitative or even both (mixed research).

- **Basic research** is an investigation on basic principles and reasons for occurrence of a particular event or process or phenomenon. It is also called theoretical research. Study or investigation of some natural phenomenon or relating to pure science are termed as basic research. Basic research sometimes may not lead to immediate use or application. It is not concerned with solving any practical problems of immediate interest. But it is original or basic in character. It provides a systematic and deep insight into a problem and facilitates extraction of scientific and logical explanation and conclusion on it. It helps build new frontiers of knowledge. The outcomes of basic research form the basis for many applied research. Basic research is used to:

- Seeks generalization,
- Aims at basic processes,
- Attempts to explain why things happen,

- Tries to get all the facts, and
- Reports in technical language of the topic.

– **Applied research** solves certain problems employing well known and accepted theories and principles. Most of the experimental research, case studies and inter-disciplinary research are essentially applied research. Applied research is helpful for basic research. A research, the outcome of which has immediate application is also termed as applied research. Such a research is of practical use to current activity.

- Studies individual or specific cases without the objective to generalize,
- Aims at any variable which makes the desired difference,
- Tries to say how things can be changed,
- Tries to correct the facts which are problematic ,and
- Reports in common language.

– **Exploratory research** might involve a literature search or conducting focus group interviews. The exploration of new phenomena in this way may help the researcher's need for better understanding, may test the feasibility of a more extensive study, or determine the best methods to be used in a subsequent study. The objective of exploratory research is to identify key issues and key variables. Its primary goal is to understand or to explain relationships.

- It uses correlations to study relationships between dimensions or characteristics off individuals, groups, situations, or events.
- Explanatory research explains (How the parts of a phenomenon are related to each other).
- Explanatory research asks the “Why” question.

– **Descriptive research** aims to describe a population, situation, or phenomenon accurately and systematically. It refers to the methods that describe the characteristics of the variables under study. This methodology focuses on answering questions relating to “what” than the “why” of the research subject. The

primary focus of descriptive research is to simply describe the nature of the demographics under study instead of focusing on the “why”. Descriptive research is called an observational research method as none of the variables in the study are influenced during the process of the research.

Basic and applied research, further divided into three types of research bearing some characteristics feature as follows:

Quantitative research:

- It is numerical, non-descriptive, applies statistics or mathematics and uses numbers.
- It is an iterative process whereby evidence is evaluated.
- The results are often presented in tables and graphs.
- It is conclusive.
- It investigates what, where and when of decision making.

Qualitative research:

- It is non-numerical, descriptive, applies reasoning and uses words.
- Its aim is to get the meaning, feeling and describe the situation.
- Qualitative data cannot be graphed.
- It is exploratory.
- It investigates the why and how of decision making.

Mixed research that involves the mixing of quantitative and qualitative methods or paradigm characteristics. Nature of data is mixture of variables, words, and images.

Some characteristics of good research includes:

- Good research follows a systematic approach to capture accurate data.
- Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.

- Real-time data and knowledge are derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

Research data is any information that has been collected, observed, generated, or created to validate original research findings. Research data can be generated for different purposes and through different processes.

- **Observational data** is captured in real-time, and is usually irreplaceable, for example sensor data, survey data, sample data, and neuro-images.
- **Experimental data** is captured from lab equipment. It is often reproducible, but this can be expensive. Examples of experimental data are gene sequences, chromatograms, and toroid magnetic field data.
- **Simulation data** is generated from test models where models and metadata are more important than output data. For example, climate models and economic models.
- **Derived or compiled data** has been transformed from pre-existing data points. It is reproducible if lost, but this would be expensive. Examples are data mining, compiled databases, and 3D models.
- **Reference or canonical data** is a static or organic conglomeration or collection of smaller (peer-reviewed) datasets, most probably published and curated. For example, gene sequence databanks, chemical structures, or spatial data portals.

LITERATURE REVIEW

A **literature review** is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe,

summarize, objectively evaluate, and clarify this previous research. It should give a theoretical base for the research and helps determine the nature of your research. The literature review acknowledges the work of previous researchers, and in so doing, assures the reader that the work has been well conceived. It is assumed that by mentioning a previous work in the field of study, that the author has read, evaluated, and assimilated that work into the work at hand. It adds value to the legitimacy of the research in many ways:

- Provides the interpretation of existing literature in light of updated developments in the field to help in establishing the consistency in knowledge and relevancy of existing materials
- It helps in calculating the impact of the latest information in the field by mapping their progress of knowledge.
- It brings out the dialects of contradictions between various thoughts within the field to establish facts
- The research gaps scrutinized initially are further explored to establish the latest facts of theories to add value to the field
- Indicates the current research place in the schema of a particular field
- Provides information for relevancy and coherency to check the research
- Apart from elucidating the continuance of knowledge, it also points out areas that require further investigation and thus aid as a starting point of any future research
- Justifies the research and sets up the research question and sets up a theoretical framework comprising the concepts and theories of the research upon which its success can be judged
- Helps to adopt a more appropriate methodology for the research by examining the strengths and weaknesses of existing research in the same field
- Increases the significance of the results by comparing it with the existing literature

- Provides a point of reference by writing the findings in the scientific manuscript
- Helps to get the due credit from the audience for having done the fact-finding and fact-checking mission in the scientific manuscripts
- The more the reference of relevant sources of it could increase more of its trustworthiness with the readers
- Helps to compare and contrast to show the originality and uniqueness of the research than that of the existing other research
- Rationalizes the need for conducting the particular research in a specified field
- Helps to collect data accurately for allowing any new methodology of research than the existing ones
- Enables the readers of the manuscript to answer the following questions of its readers for its better chances for publication

RESEARCH QUESTION

Formulation of research question (RQ) is an essentiality before starting any research. It aims to explore an existing uncertainty in an area of concern and points to a need for deliberate investigation. It is, therefore, pertinent to formulate a good RQ. Research plays an important role in developing clinical practices and instituting new health policies. Hence, there is a need for a logical scientific approach as research has an important goal of generating new claims. A good RQ is an asset as it:

- Details the problem statement
- Further describes and refines the issue under study
- Adds focus to the problem statement
- Guides data collection and analysis
- Sets context of research.

RESEARCH HYPOTHESIS

A research hypothesis is a specific, clear, and testable proposition or predictive statement about the possible outcome of a scientific research study based on a particular property of a population, such as presumed differences between groups on a particular variable or relationships between variables. Specifying the research hypotheses is one of the most important steps in planning a scientific quantitative research study. Following are the characteristics of hypothesis:

- The hypothesis should be clear and precise to consider it to be reliable.
- If the hypothesis is a relational hypothesis, then it should be stating the relationship between variables.
- The hypothesis must be specific and should have scope for conducting more tests.
- The way of explanation of the hypothesis must be very simple and it should also be understood that the simplicity of the hypothesis is not related to its significance.

A hypothesis is a tentative statement about the relationship between two or more variables. It is a specific, testable prediction about what you expect to happen in a study. The null and alternative hypotheses are two mutually exclusive statements about a population. A hypothesis test uses sample data to determine whether to reject the null hypothesis.

- _ **Null hypothesis (H_0)** : The null hypothesis states that a population parameter (such as the mean, the standard deviation, and so on) is equal to a hypothesized value. The null hypothesis is often an initial claim that is based on previous analyses or specialized knowledge.

- _ **Alternative Hypothesis (H_1)**: The alternative hypothesis states that a population parameter is smaller, greater, or different than the hypothesized value in the null hypothesis. The alternative hypothesis is what you might believe to be true or hope to prove true.

SELECTING STUDY AREA AND TARGET POPULATION

Study area means the land surface area which was mapped and quantitatively sampled during the baseline vegetation inventory. The study area generally coincides with the permit area (or amendment area) but may exceed those boundaries with prior approval from the Administrator.

In research terminology the Population can be explain as a comprehensive group of individuals, institutions, objects and so forth with have a common characteristic that are the interest of a researcher. The common characteristics of the groups distinguish them from other individual, institutions, objects and so forth. The term universe is also used as synonyms to population. Sometimes population can be counted easily, which is called finite population. Population of medical students is an example of finite population. The unlimited or unknown number of populations Identify the problem of a specific study area:

- No previous work on that problem.
- Select the problem for mitigation.
- Identify the victimized people.
- Do primary survey.
- Mitigate the problem.
- Do the research can be called as infinite population.

COLLECTION OF DATA

Data collection is defined as the procedure of collecting, measuring, and analysing accurate insights for research using standard validated techniques. A researcher can evaluate their hypothesis on the basis of collected data. In most cases, data collection is the primary and most important step for research, irrespective of the field of research. The approach of data collection is different for different fields of study, depending on the required information. The most critical objective of data collection is ensuring that information-rich and reliable data is collected for statistical analysis so that data-driven decisions can be made for research.

Secondary data means data that are already available i.e., they refer to the data which have already been collected and analyzed by someone else. When the researcher utilizes secondary data, then he has to look into various sources from where he can obtain them. In this case he is certainly not confronted with the problems that are usually associated with the collection of original data. Secondary data may either be published data or unpublished data. Usually published data are available in:

- Various publications of the central, state and local governments;
- Various publications of foreign governments or of international bodies and their subsidiary organizations;
- Technical and trade journals;
- Books, magazines, and newspapers;
- Reports and publications of various associations connected with business and industry, banks, stock exchanges, etc.;
- Reports prepared by research scholars, universities, economists, etc. in different fields; and
- Public records and statistics, historical documents, and other sources of published information.

The sources of unpublished data are many; they may be found in diaries, letters, unpublished biographies, and autobiographies and also may be available with scholars and research workers, trade associations, labour bureaus and other public/private individuals and organizations.

PREPARATION OF QUESTIONNAIRE

A questionnaire can be a useful tool for gathering information. It can be used for survey research, gathering data or testing a hypothesis. For a questionnaire to be effective and give you the information you are looking for, you will need to design a survey that is easy to understand and easy to complete. A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. The questionnaire was invented by Sir Francis Galton. A questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in by himself.

It consists of a number of questions printed or typed in a definite order. These forms are actually mailed to the respondent who was expected to read and understand the questions and reply to them by writing the relevant answers in the spaces provided. Characteristics of a questionnaire:

- A proper series of questions should be followed to increase the rate of response to the questions. Therefore, it is necessary to develop a structured sequence of questions that contain questions in the sequence.
- The uniformity of questions is essential to keep respondents involved in the questionnaire until the end.
- Exploratory characteristics of the questionnaire help you in collecting qualitative data. You can ask any question as long as it is related to the subject. The exploratory nature of a questionnaire helps you in getting detailed information about the topic.
- A good survey is easy to understand. It should be designed in such a way so that everyone can read and understand the questions irrespective of their education level. This is an essential characteristic of a questionnaire.

POPULATION OR AGE-SEX PYRAMID

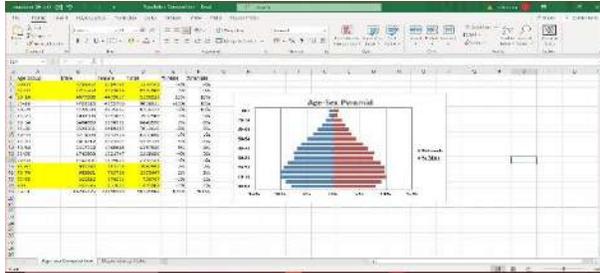
Population pyramid or "Age-sex pyramid" is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically forms the shape of a pyramid when the population is growing. Males are usually shown on the left and females on the right, and they may be measured by count or as a percentage of the total population. This tool can be used to visualize the age of a particular population. It is also used in ecology to determine the overall age distribution of a population; an indication of the reproductive capabilities and likelihood of the continuation of a species. Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition.

Steps to create age-sex pyramid:

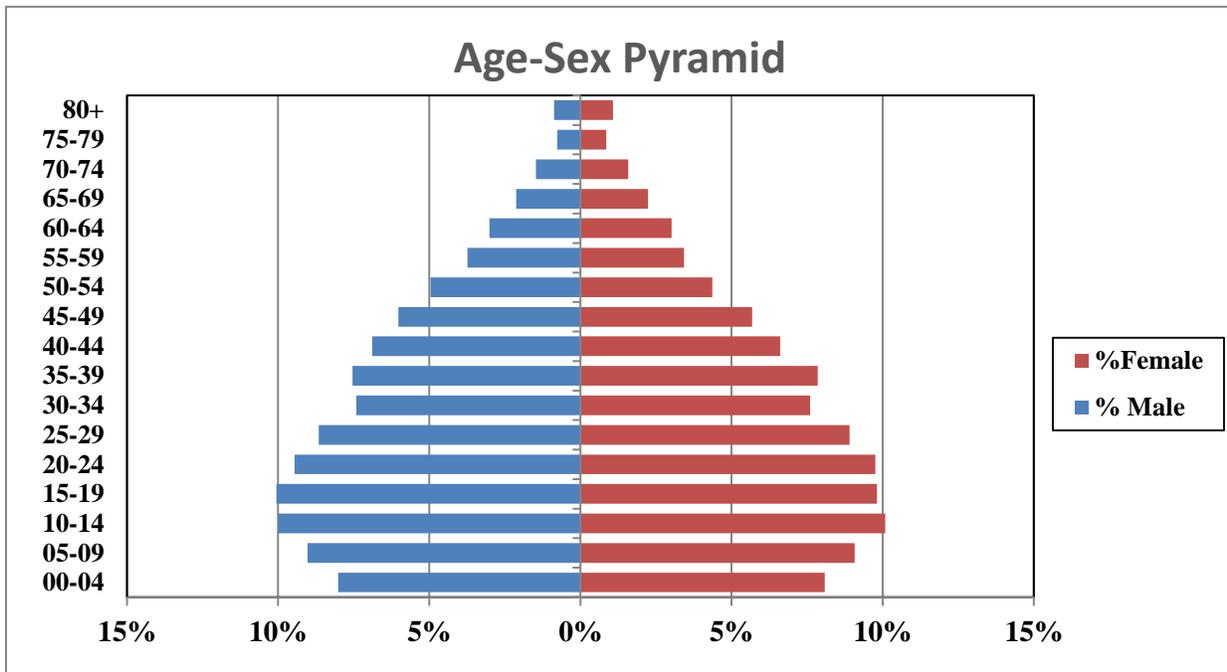
Step 1: First, an excel sheet is created where the Age group, Male, Female and Total population are added.

Step 2: Next step is to calculate the percentage of female and male population. For, percentage of male/female population the formula was $0 - (\text{cell no./cell no. } \$) > \text{sum of all the percentage.}$

Step 3: After calculation percentage, the data is selected > insert> select suitable bar.



Step 4: After selecting the necessary chart > chart title> select age group > format axis> labels> format axis next> toolbox> number> custom>adding the format



OCUPATIONAL STRUCTURE

The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a

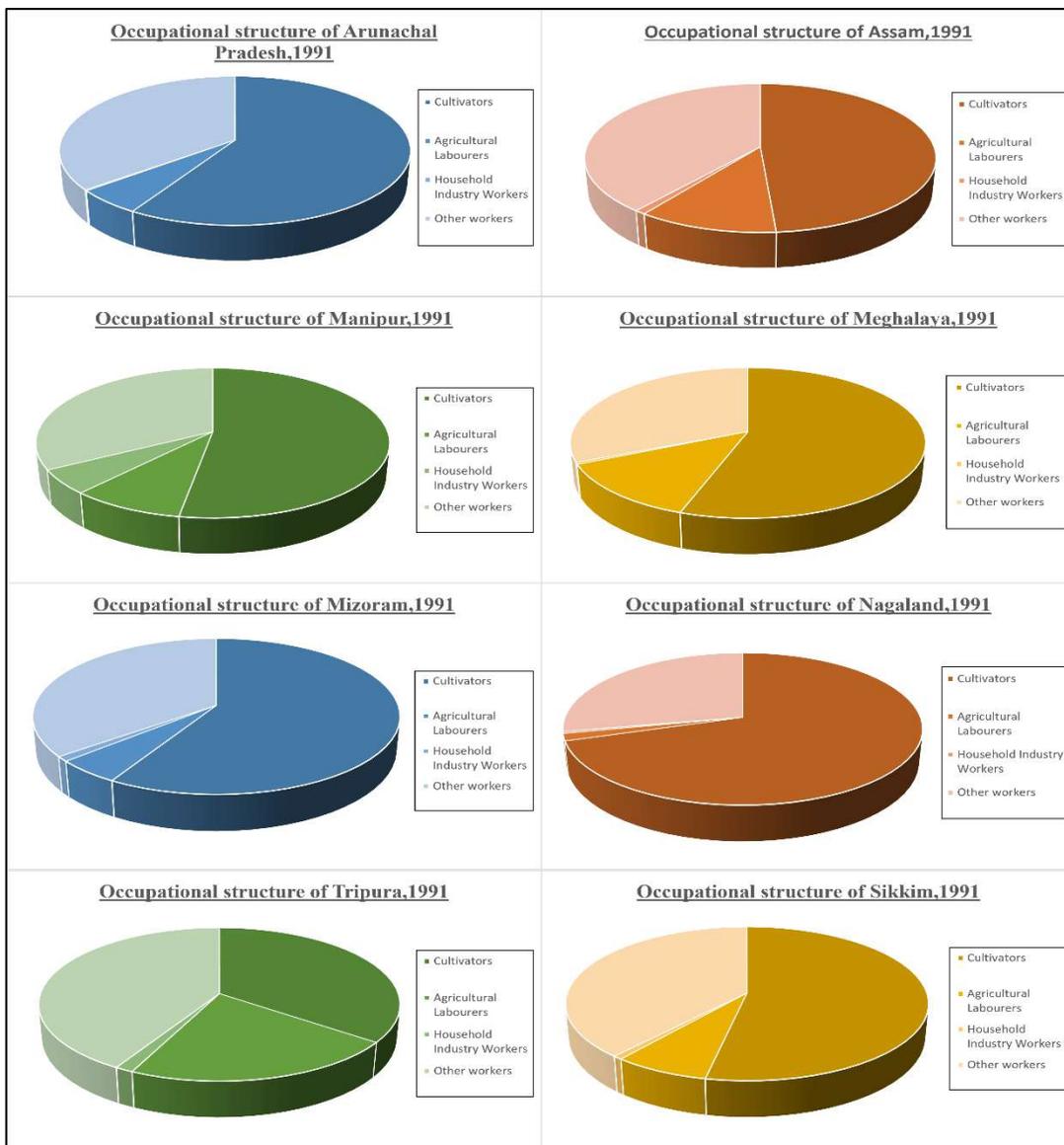
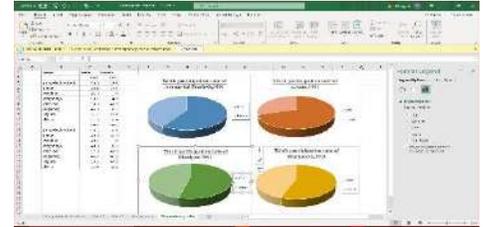
country who are employed in different sectors like agriculture, manufacturing, and transport, among many others constitute the occupational structure of a nation.

Steps to structure occupational structure:

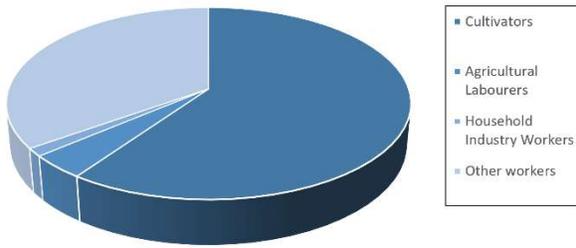
Step 1: First , input the data set given in the excel sheet.

Step 2: Next, select the data set needed> Insert> Insert Pie chart> select style>Ok.

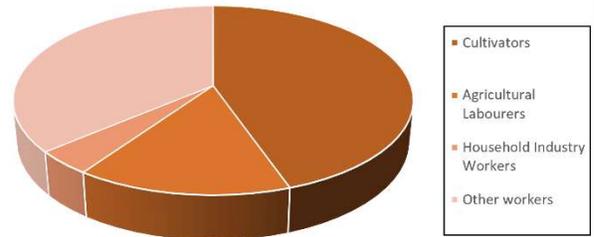
Step 3: Follow step 2 for as any charts as needed, after that arrange them all together> right click> Save as Picture



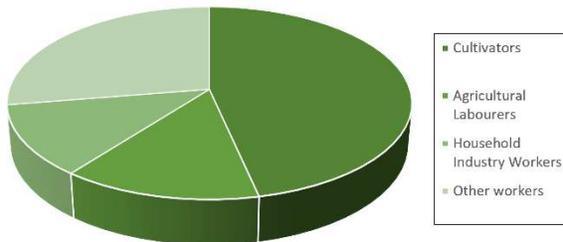
Occupational structure of Arunachal Pradesh,2001



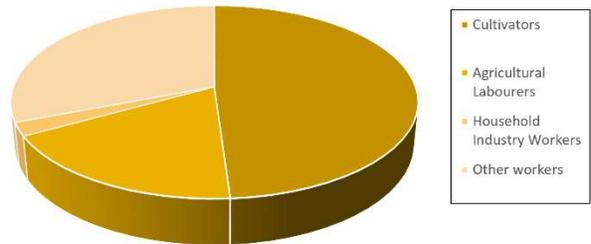
Occupational structure of Assam,2001



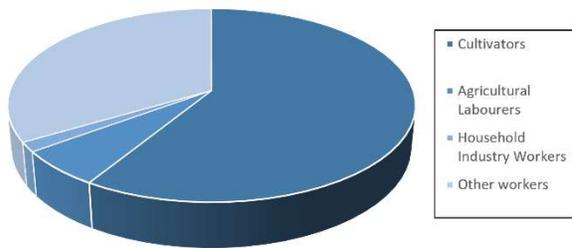
Occupational structure of Manipur,2001



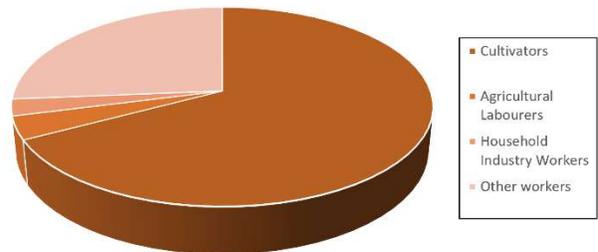
Occupational structure of Meghalaya,2001



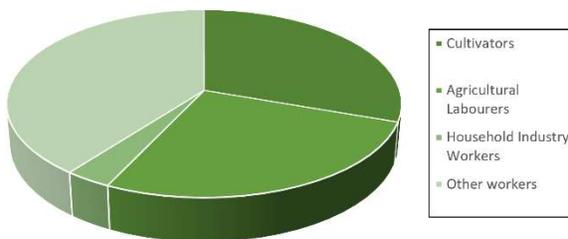
Occupational structure in Mizoram,2001



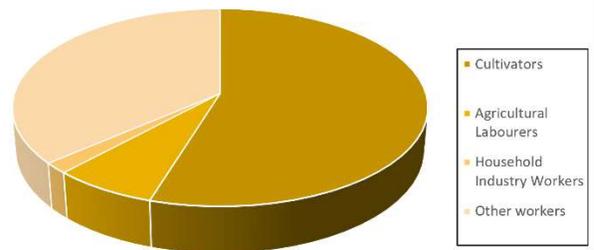
Occupational structure of Nagaland,2001



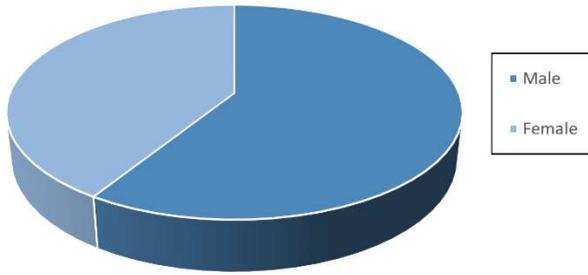
Occupational structure of Tripura,2001



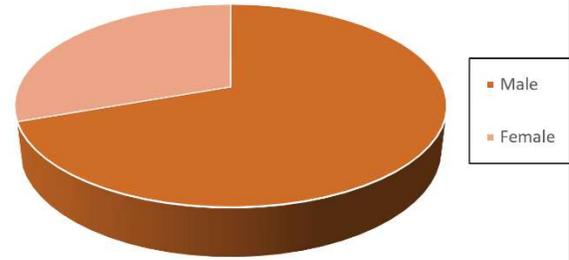
Occupational structure of Sikkim,2001



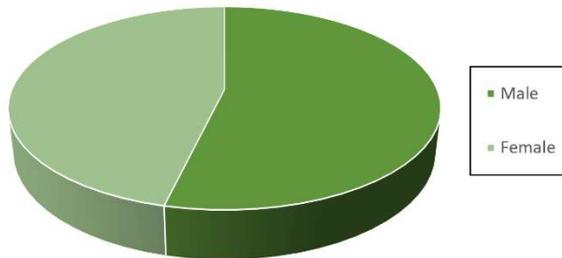
Work-participation rate of Arunachal Pradesh,1991



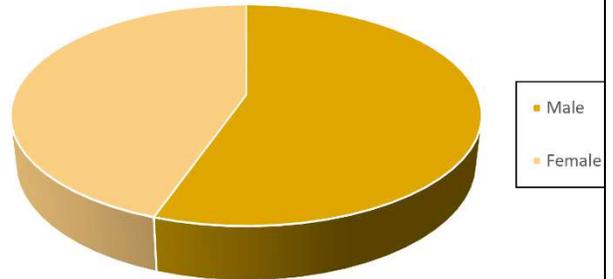
Work-participation rate of Assam,1991



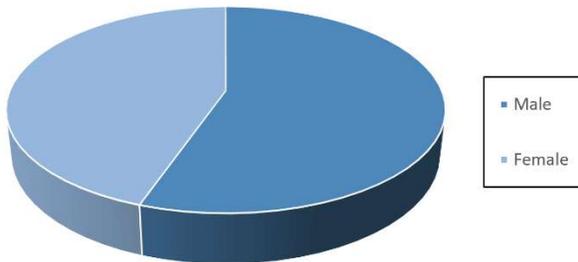
Work-participation rate of Manipur,1991



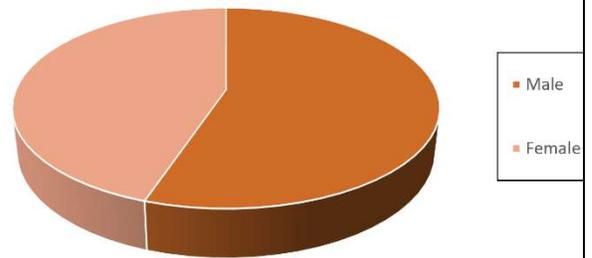
Work-participation rate of Meghalaya,1991



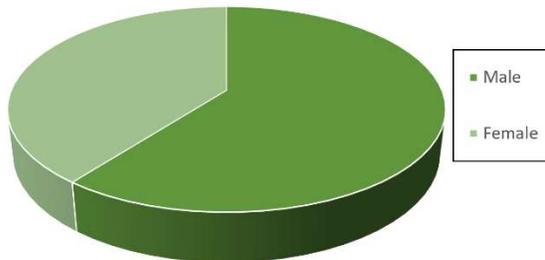
Work-participation rate of Mizoram,1991



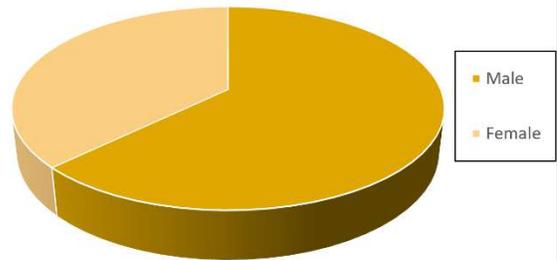
Work-participation rate of Nagaland,1991



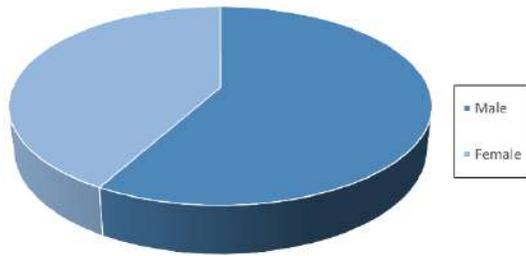
Work-participation rate of Tripura,1991



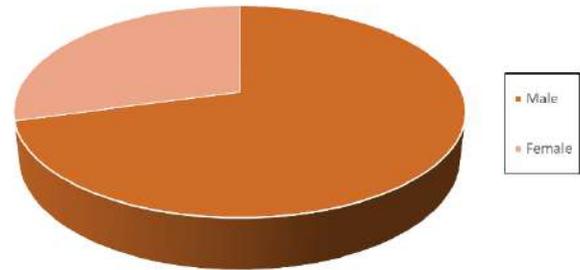
Work-participation rate of Sikkim,1991



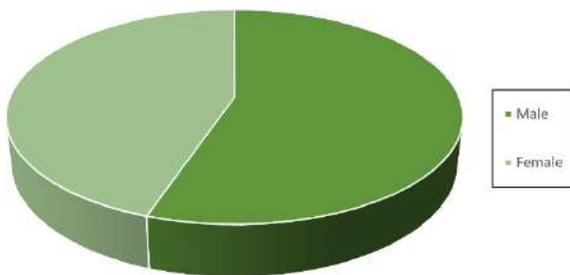
Work-participation rate of Arunachal Pradesh,2001



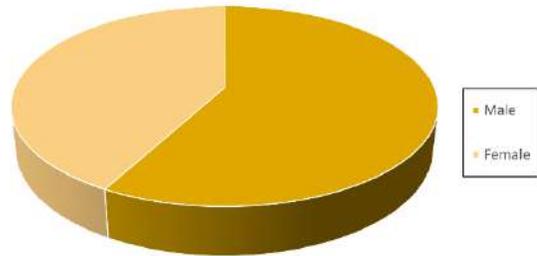
Work-participation rate of Assam,2001



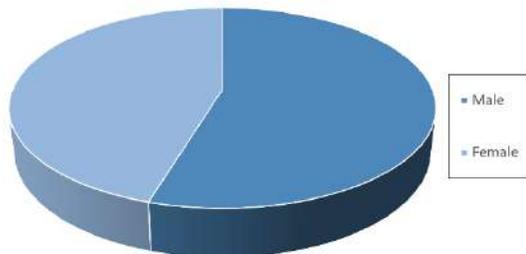
Work-participation rate of Manipur,2001



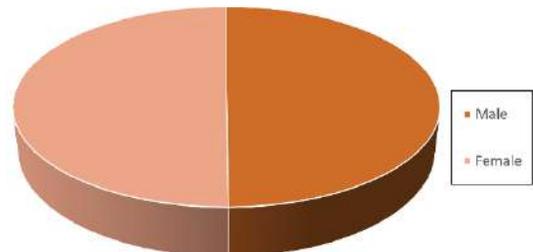
Work-participation rate of Meghalaya,2001



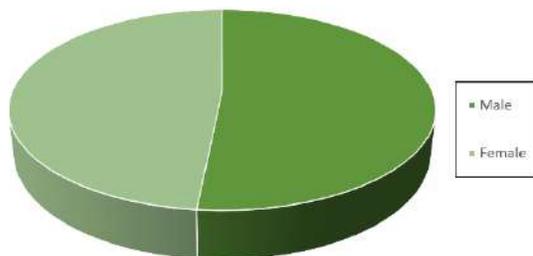
Work-participation rate of Mizoram,2001



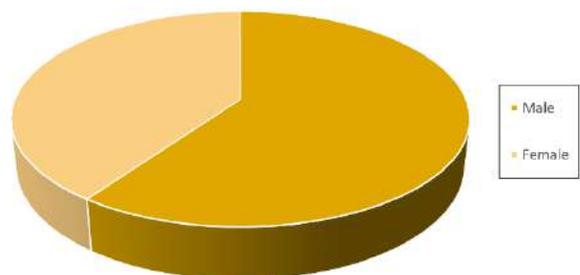
Work-participation rate of Nagaland,2001



Work-participation rate of Tripura,2001



Work-participation rate of Sikkim,2001



DEPENDENCY RATIO

The dependency ratio is an age population ratio of those typically not in the labor force (the dependent part ages 0 to 14 and 65+) and those typically in the labor force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population. Consideration of the dependency ratio is essential for governments, economists, bankers, business, industry, universities, and all other major economic segments which can benefit from understanding the impacts of changes in population structure. A low dependency ratio means that there are sufficient people working who can support the dependent population. A lower ratio could allow for better pensions and better health care for citizens. A higher ratio indicates more financial stress on working people and possible political instability.

$$\text{(Total) Dependency ratio} = \frac{\text{(number of people aged 0 to 14)} + \text{(number of people aged 65 and over)}}{\text{number of people aged 15 to 64}} \times 100$$

Steps to formulate dependency ratio:

Step 1: First, input the data > enter the formula for 0 to 14 years = sum (cell no. : cell no.)

Step 2: Next, the formula is put for 65 to 80+ = sum (cell no. : cell no.)

Step 3: After that the calculation is done where the formula is 15 to 65 = sum (cell no. : cell no.)

Age Group	Male	Female	Total
0-4	5,100,000	5,100,000	10,200,000
5-9	4,800,000	4,800,000	9,600,000
10-14	4,500,000	4,500,000	9,000,000
15-19	4,200,000	4,200,000	8,400,000
20-24	3,900,000	3,900,000	7,800,000
25-29	3,600,000	3,600,000	7,200,000
30-34	3,300,000	3,300,000	6,600,000
35-39	3,000,000	3,000,000	6,000,000
40-44	2,700,000	2,700,000	5,400,000
45-49	2,400,000	2,400,000	4,800,000
50-54	2,100,000	2,100,000	4,200,000
55-59	1,800,000	1,800,000	3,600,000
60-64	1,500,000	1,500,000	3,000,000
65-69	1,200,000	1,200,000	2,400,000
70-74	900,000	900,000	1,800,000
75-79	600,000	600,000	1,200,000
80-84	300,000	300,000	600,000
85+	150,000	150,000	300,000
Total	23,845,838	23,845,839	47,691,677

Step 4: The dependency ratio calculation was done by using the formula is ((first sum+ second sum)/ third sum)*100

0-4, 5-9, 10-14 and 65+ people were under the dependency ratio. This range of people are dependent on the 15-64 year age range. Hence, the dependency ratio of 47.691677. The summation of total dependency on people was 29296645 according to the census 2011 and the summation of independent or productive was 61429261.

MEASUREMENT OF MIGRATION

Migration consists of all the relatively permanent changes of residence into, out of, or within a given political division or administrative area. Typically, internal migration involves the crossing of one or more administrative divisions—such as states, counties, or provinces, but it always occurs within the boundaries of a given country. The population increment between any two dates for any given geographic area is the result of natural increase (births minus deaths) and net migratory movement. If the country is a closed one as far as population growth is concerned, then the net migratory movement for a given geographic area must be the result of internal migration, i.e., in-migration minus out-migration. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put as:

$$\text{Net M} = (P_{t+n}) - P_t - (B - D)$$

where for any given area Net M = net migration, P is the population at the earlier census, P_{t+n} is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to residents of the area during the same period. An application of the formula is given as next. Estimate of Net Migration to Madras city by the vital statistics method, 1951-61:

1. Population of Madras, 1951 = p, =1,416,056
2. Population of Madras, 1961 = p,+ 1 =1,729,141
3. Increase in population, 1951-1961 = (2) - (1) =313,085
4. Number of births in Madras, 1951-1961 = B =653,190
5. Number of deaths in Madras, 1951-1961 = D =371,286
6. Natural increase in Madras, 1951-1961 = (4) - (5) =281,904
7. Net migration to Madras, 1951-1961 = (3)-(6) =31,181

(Source: The population figures are taken from Census of India, vol. IX, Madras, part II-A. The figures of births and deaths are taken from Vital Statistics of India, 1962)

LAND USE / LAND COVER MAP

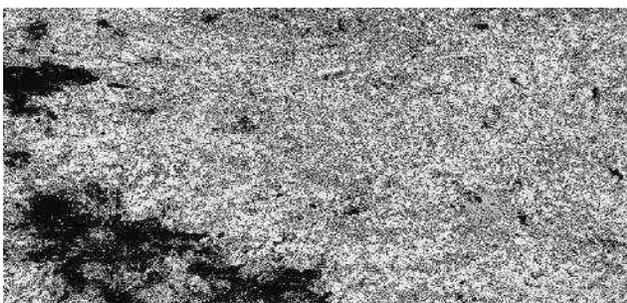
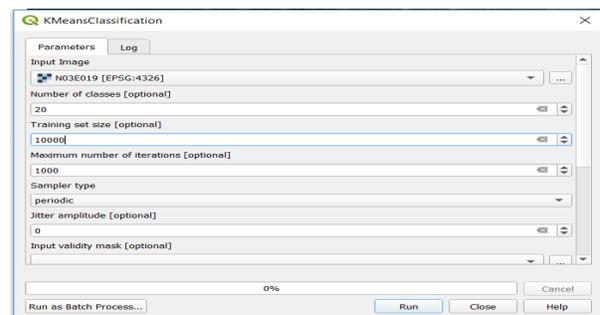
Land Use Land Cover (LULC) maps of an area provide information to help users to understand the current landscape. Annual LULC information on national spatial databases will enable the monitoring of temporal dynamics of agricultural ecosystems, forest conversions, surface water bodies, etc. on annual basis .Land management and land planning requires a knowledge of the current state of the landscape. Understanding current land cover and how it is being used, along with an accurate means of monitoring change over time, is vital to any person responsible for land management.

Steps to create a land use map:

Step 1: First, add a raster layer >Add Layer > Add Raster Layer.

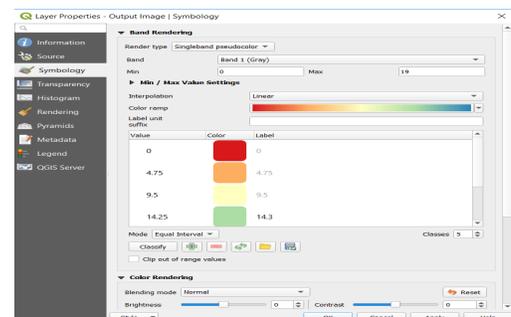
Step 2: Next in the search box of Processing Toolbox >KMeans > KMeansClassification.

Step 3: Select the input image > type the Number of classes to 20 (default classes are 5) > fill training size to 10000.



Step 4: Type the name of output image save to file> Run .Output image directly display on canvas.

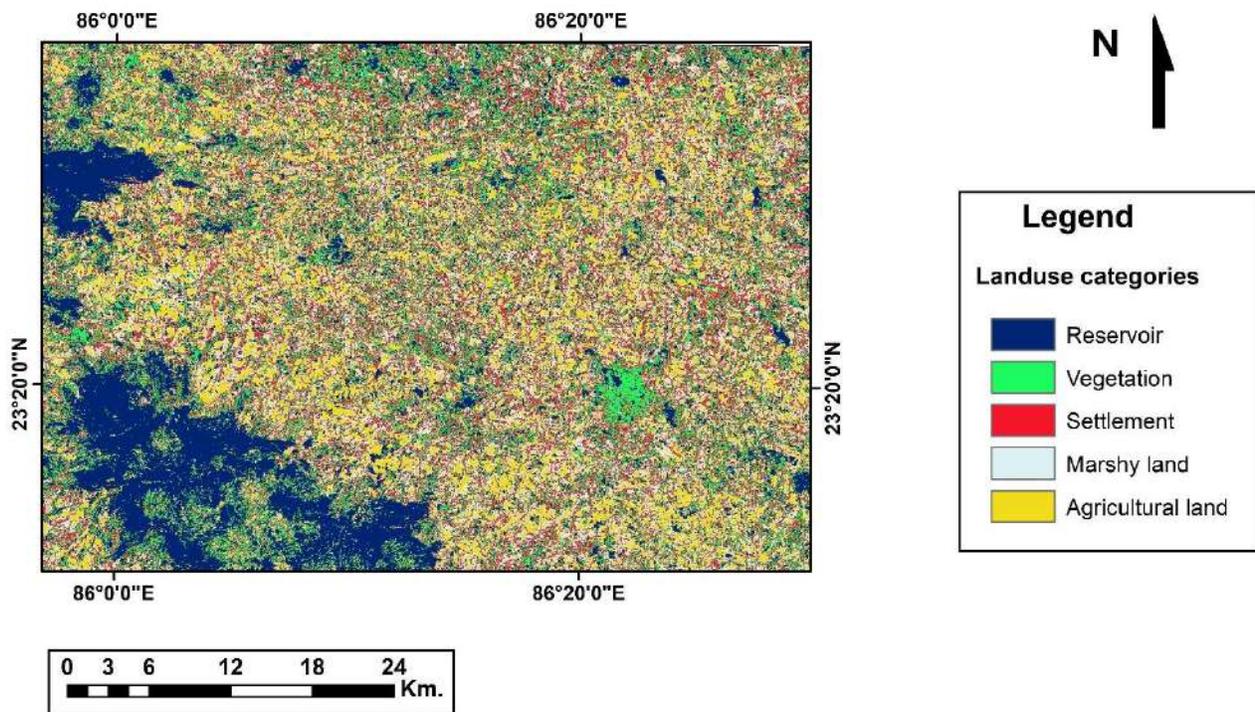
Step 5: In the layer panel, right click on the output layer and select Properties >Symbology> under Render Type >Singleband Psuedocolor> Select the Color Ramp (spectral)> Mode Equal



Interval (default selection is continuous)> number of classes changing from 5 to 20> Ok

Step 6: Output image can also be classified according to discrete interpolation if desired. Lastly, we construct the map under New Print Layout > Create Print Layout, we give a name for the file. Here, we added the map(Add Map), grid(Grids), scale(Add Scale Bar) ,north-line (Add North Arrow)and legend (Add legend) to finish off the layout. Then under Layout > Export as Image to get the finished map, in desired name ,location and export resolution(> 300 dpi).

Land Use Land Cover map



Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

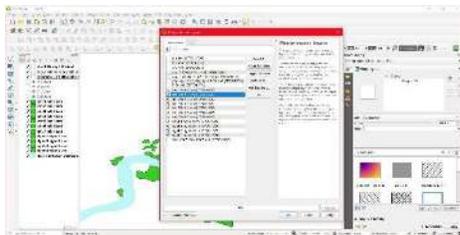
MAPPING OF HUMAN HABITATIONS AND DETECTION OF CHANGE

Remote sensing of human settlement patterns has experienced an upward trend in volume especially during the current 21st “urban century.” Currently, more than half of the world’s population are urban dwellers, and this number is still rapidly increasing. Settlements - and urban areas in particular - represent the centers of human activity. They include negative aspects like the loss of natural habitats, biodiversity and fertile soils, climate impacts, pollution, crime or traffic problems, making urbanization one of the most pressing global challenges. Accordingly, a profound understanding of the global spatial distribution and evolution of human settlements is a key requirement to enable sustainable development of urban and rural settlements.

Steps to create changing settlement patterns:

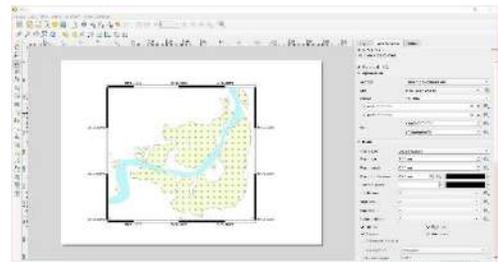
Steps 1: Open Google Earth Pro >Add Placemark >Save Place As >save them at wanted locations.

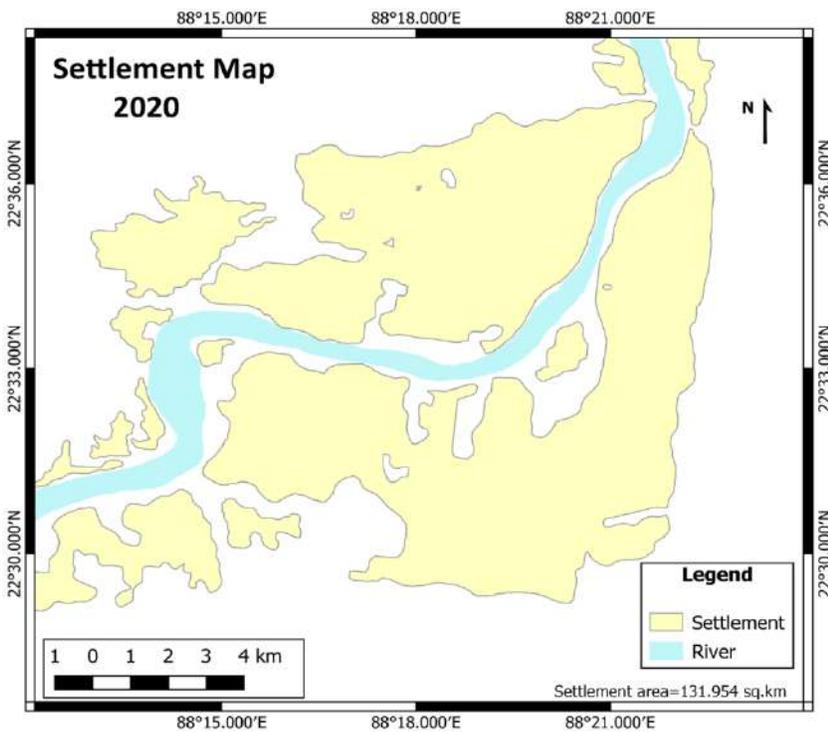
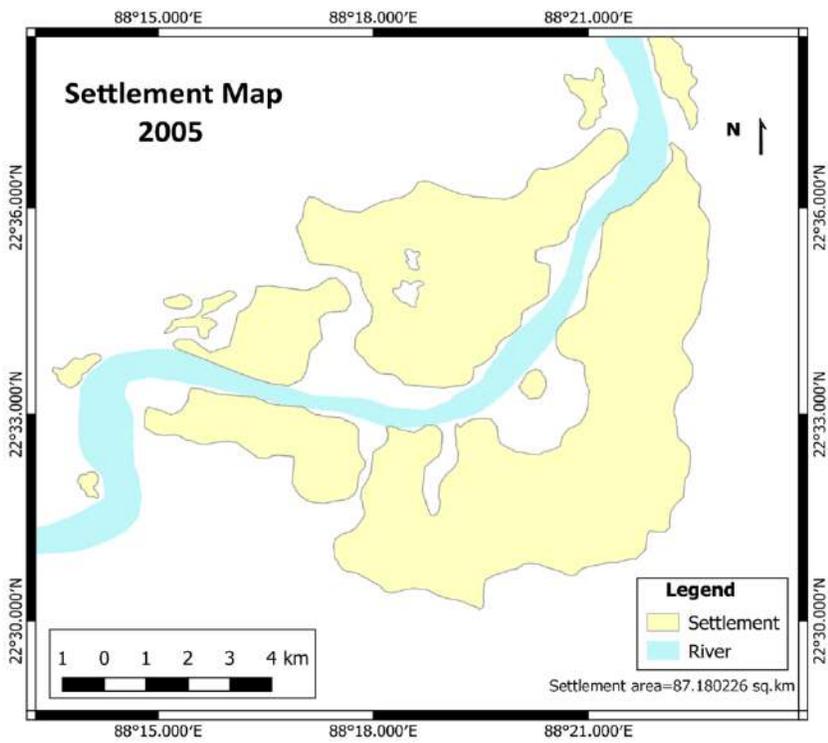
Step 2: Next, go on the Add Polygon >New Polygon dialog box >select the needed options >digitize the settlement areas >Save Place As.



Step 3: Open QGIS >Add Vector Layer >add the layers saved from previous digitization.

Step 4: Lastly, we construct the map under New Print Layout > Create Print Layout, we give a name for the file. Here, we added the map(Add Map), grid(Grids), scale(Add Scale Bar) ,north-line (Add North Arrow)and legend (Add legend) to finish off the layout. Then under Layout > Export as Image to get the finished map, in desired name ,location and export resolution(> 300 dpi).





Settlement Increase= 51%

SPATIAL PLANNING AND LAYOUT FOR A GRAM PANCHAYAT

Spatial planning mediates between the respective claims on space of the state, market, and community. In so doing, three different mechanisms of involving stakeholders, integrating sectoral policies, and promoting development projects mark the three schools of transformative strategy formulation, innovation action and performance in spatial planning.

Panchayats in India are an age-old institution for governance at village level. Through the 73rd Constitutional Amendment, Panchayati Raj Institutions (PRI) were strengthened with clear areas of jurisdiction, authority, and funds. The word “Panchayat” means assembly (ayat) of five (panch) and raj means “rule”. Traditionally Panchayats consisted of elderly and wise people chosen by the local community, who used to settle disputes between individuals and villages. The Panchayati Raj Institution (PRI) consists of three levels: Gram Panchayat at the village level, Block Panchayat or Panchayat Samiti at the intermediate level and Zilla Panchayat at the district level.

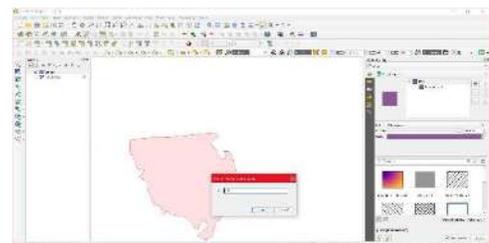
Gram Panchayat consists of a village, or a group of villages divided into smaller units called “Wards”. Each ward selects or elects a representative who is known as the Panch or ward member. The members of the Gram Sabha elect the ward members through a direct election. The Sarpanch or the president of the Gram Panchayat is elected by the ward members as per the State Act. The Sarpanch and the Panch are elected for a period of five years. Gram Panchayat is governed by the elected body and administration. The secretary is normally in charge of the administrative duties of the Gram Panchayat.

Steps to create planning map of Gram Panchayat:

Step 1: Open the Mouza map collected from Gram Panchayat.

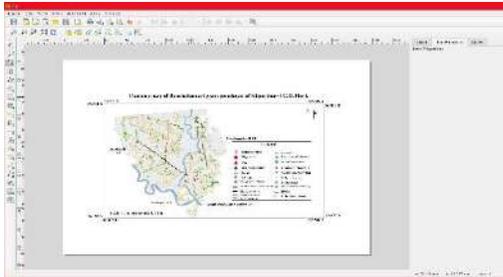
Step 2: Next, QGIS Georeference >Georeference the map and clip the particular the village boundary.

Step 3: Using GPS survey collect every impotent place of the village like school, police station, any administrative building available



found from gram panchayat by secondary data.

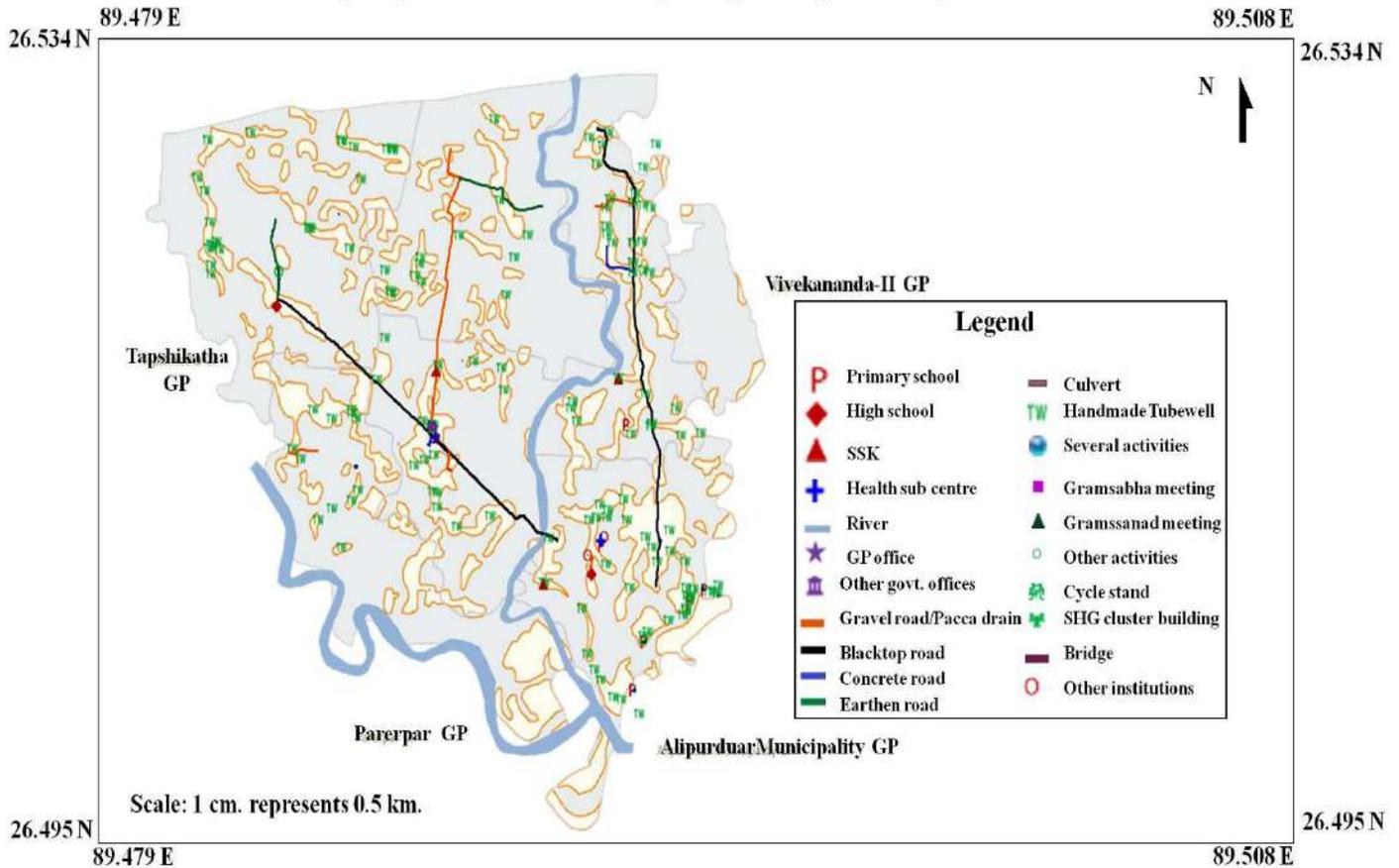
Step 4: Plot the places as a point >digitized settlements as well as road.



Step 5: Lastly, we construct the map under New Print Layout > Create Print Layout, we give a name for the file. Here, we added the map(Add Map), grid(Grids), scale(Add Scale Bar) ,north-line (Add North Arrow)and legend (Add legend) to finish off the layout. Then under

Layout > Export as Image to get the finished map, in desired name ,location and export resolution(> 300 dpi).

Planning map of Banchukamari gram panchayat of Alipurduar-I C.D. block



ACKNOWLEDGEMENT

I would like to thank our Prof. Shrinwantu Raha , for helping us with our entire project and teaching us our basic skills and knowledge. The patience and hard work is really appreciated and I'm grateful for it. I would also like to express my gratitude towards my classmates who were extremely helpful throughout this semester and a great support system too, specially while completing a degree in a worldwide pandemic.

3/9/2021

Practical Note Book

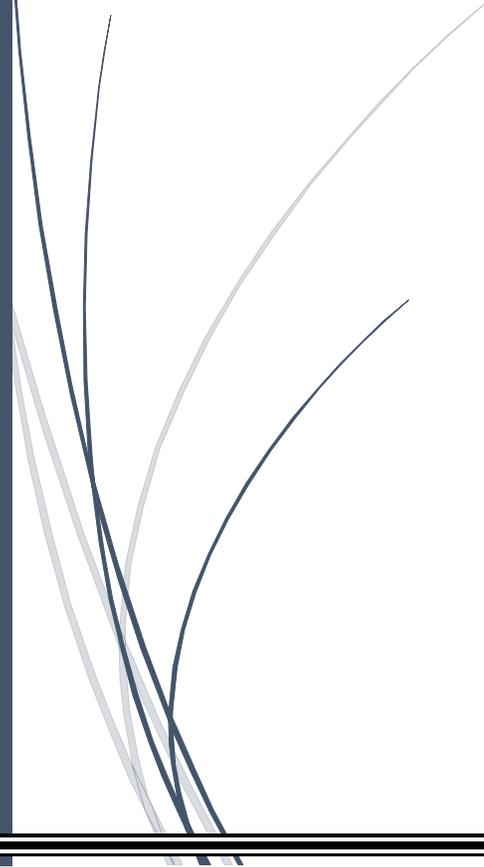
Name- Shanku Ghosh

Pg 4th Semester

Roll- BGC/MGM/SIV/21

No- 305

Reg.No.-1251611400268



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Literature review on Research problem

A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe, summarize, objectively evaluate and clarify this previous research. It should give a theoretical base for the research and help you (the author) determine the nature of your research. The literature review acknowledges the work of previous researchers, and in so doing, assures the reader that your work has been well conceived. It is assumed that by mentioning a previous work in the field of study, that the author has read, evaluated, and assimilated that work into the work at hand.

A literature review creates a "landscape" for the reader, giving her or him a full understanding of the developments in the field. This landscape informs the reader that the author has indeed assimilated all (or the vast majority of) previous, significant works in the field into her or his research.

"In writing the literature review, the purpose is to convey to the reader what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are. The literature review must be defined by a guiding concept (e.g. your research objective, the problem or issue you are discussing, or your argumentative thesis). It is not just a descriptive list of the material available, or a set of summaries.

Research question and Hypothesis

A. Research question:

A **research question** is 'a question that a research project sets out to answer'. Choosing a research question is an essential element of both quantitative and qualitative research. Investigation will require data collection and analysis, and the methodology for this will vary widely. Good research questions seek to improve knowledge on an important topic, and are usually narrow and specific.

To form a research question, one must determine what type of study will be conducted such as a qualitative, quantitative, or mixed study. Additional factors, such as project funding, may not only affect the research question itself but also when and how it is formed during the research process. Literature suggests several variations on criteria selection for constructing a research question, such as the FINER or PICOT methods.

B. Hypothesis:

Ordinarily, when one talks about hypothesis, one simply means a mere assumption or some supposition to be proved or disproved. But for a researcher hypothesis is a formal question that he intends to resolve. Thus a hypothesis may be defined as a proposition or a set of proposition set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjecture to guide some investigation or accepted as highly probable in the light of established facts. Quite often a research hypothesis is a predictive statement, capable of being tested by scientific methods, that relates an independent variable to some dependent variable. For example, consider statements like the following ones:

“Students who receive counselling will show a greater increase in creativity than students not receiving counselling”

Or “the automobile A is performing as well as automobile B.”

These are hypotheses capable of being objectively verified and tested. Thus, we may conclude that a hypothesis states what we are looking for and it is a proposition which can be put to a test to determine its validity.

Types of Hypothesis

There are six forms of hypothesis and they are:

- Simple hypothesis
- Complex hypothesis
- Directional hypothesis
- Non-directional hypothesis

- Null hypothesis
- Associative and casual hypothesis

Simple Hypothesis

It shows a relationship between one dependent variable and a single independent variable. For example – If you eat more vegetables, you will lose weight faster. Here, eating more vegetables is an independent variable, while losing weight is the dependent variable.

Complex Hypothesis

It shows the relationship between two or more dependent variables and two or more independent variables. Eating more vegetables and fruits leads to weight loss, glowing skin, reduces the risk of many diseases such as heart disease, high blood pressure and some cancers.

Directional Hypothesis

It shows how a researcher is intellectual and committed to a particular outcome. The relationship between the variables can also predict its nature. For example- children aged four years eating proper food over a five-year period are having higher IQ levels than children not having a proper meal. This shows the effect and direction of effect.

Non-directional Hypothesis

It is used when there is no theory involved. It is a statement that a relationship exists between two variables, without predicting the exact nature (direction) of the relationship.

Null Hypothesis

It provides the statement which is contrary to the hypothesis. It's a negative statement, and there is no relationship between independent and dependent variables. The symbol is denoted by "HO".

Associative and Causal Hypothesis

Associative hypothesis occurs when there is a change in one variable resulting in a change in the other variable. Whereas, causal hypothesis proposes a cause and effect interaction between two or more variables.

Selecting study area

- 1. Read scientific literature:** Published scientific literature gives a good idea about the research field and the big unanswered questions that are left to be studied. Scientific reviews on the topic are often useful to understand the big discoveries in the field and the anticipated future studies that will provide more information. It is also important to know if the research area has sufficient unanswered questions that will be interesting to funding agencies. Try to understand if the field has long-term potential. Scientists often work on certain research areas for decades and so thinking ahead about hypothetical questions and probable answers is one key to success.
- 2. Attend conferences/seminars:** Attending both large and small meetings help us connect with our peers and have insightful discussions. Meetings also have poster sessions on various topics that may be useful to learn about the different research areas out there. Such meetings are also a good place to learn about technical details or new experimental strategies, which are often important when forging into a different field.
- 3. Brainstorm ideas with peers:** When looking for a research laboratory it is important to find something that interests you. Working on an interesting question will help you go the extra mile and aid in making significant discoveries. Talk to your peers about their experiences and the pros/cons in their research field. Peers can also help review research grants and their experience and perspectives may provide useful feedback.
- 4. Define focused questions in the research area:** Research areas can be very broad. It is easy to digress into multiple directions without focus. Before diving into the research, decide on a few hypotheses and preliminary experiments. Having more than one hypothesis will be important in case the primary hypothesis does not hold. Once experiments work and the project progresses, remember to stay focused. As part of your scientific growth, learn to think of tangential experiments that may be useful projects for other members of the laboratory.
- 5. Ensure the research is fundable:** To continue doing research it is essential to have funding. Before delving into the research define the significance of the proposed research. It is always useful if discoveries can, in the future, cure or treat diseases. Significance also helps us explain our research to nonscientists and family, so that they can relate to the research and understand what we study. Public outreach will help get more funding and aid in conducting more research.

Collecting secondary data

Secondary data means data that are already available i.e., they refer to the data which have already been collected and analysed by someone else. When the researcher utilises secondary data, then he has to look into various sources from where he can obtain them. In this case he is certainly not confronted with the problems that are usually associated with the collection of original data. Secondary data may either be published data or unpublished data. Usually published data are available in: (a) various publications of the central, state or local governments; (b) various publications of foreign governments or of international bodies and their subsidiary organizations; (c) technical and trade journals; (d) books, magazines and newspapers; (e) reports and publications of various associations connected with business and industry, banks, stock exchanges, etc.; (f) reports prepared by research scholars, universities, economists, etc. in different fields; and (g) public records and statistics, historical documents, and other sources of published information. The sources of unpublished data are many; they may be found in diaries, letters, unpublished biographies and autobiographies and also may be available with scholars and research workers, trade associations, labour bureaus and other public/ private individuals and organizations.

Researcher must be very careful in using secondary data. He must make a minute scrutiny because it is just possible that the secondary data may be unsuitable or may be inadequate in the context of the problem which the researcher wants to study. In this connection Dr. A.L. Bowley very aptly observes that it is never safe to take published statistics at their face value without knowing their meaning and limitations and it is always necessary to criticise arguments that can be based on them. B

Preparing survey schedule and questionnaire

A. Schedule survey:

COLLECTION OF DATA THROUGH SCHEDULES This method of data collection is very much like the collection of data through questionnaire, with little difference which lies in the fact that schedules (proforma containing a set of questions) are being filled in by the enumerators who are specially appointed for the purpose. These enumerators along with schedules, go to respondents, put to them the questions from the proforma in the order the questions are listed and record the replies in the space meant for the same in the proforma. In certain situations, schedules may be handed over to respondents and enumerators may help them in recording their answers to various questions in the said schedules. Enumerators explain the aims and objects of the investigation and also remove the difficulties which any respondent may feel in understanding the implications of a particular question or the definition or concept of difficult terms.

This method requires the selection of enumerators for filling up schedules or assisting respondents to fill up schedules and as such enumerators should be very carefully selected. The enumerators should be trained to perform their job well and the nature and scope of the investigation should be explained to them thoroughly so that they may well understand the implications of different questions put in the schedule. Enumerators should be intelligent and must possess the capacity of cross-examination in order to find out the truth. Above all, they should be honest, sincere, hardworking and should have patience and perseverance.

This method of data collection is very useful in extensive enquiries and can lead to fairly reliable results. It is, however, very expensive and is usually adopted in investigations conducted by governmental agencies or by some big organizations. Population census all over the world is conducted through this method.

B. Questionnaire survey:

A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questionnaire is mailed to respondents who are expected to read and understand the questions and write down the reply in the space meant for the purpose in the questionnaire itself. The respondents have to answer the questions on their own.

The method of collecting data by mailing the questionnaires to respondents is most extensively employed in various economic and business surveys. The merits claimed on behalf of this method are as follows:

1. There is low cost even when the universe is large and is widely spread geographically.
2. It is free from the bias of the interviewer; answers are in respondents' own words.

3. Respondents have adequate time to give well thought out answers.

4. Respondents, who are not easily approachable, can also be reached conveniently.

5 Large samples can be made use of and thus the results can be made more dependable and reliable.

Focus Group discussion (FGD)

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

The group's composition and the group discussion should be carefully planned to create a non-intimidating environment, so that participants feel free to talk openly and give honest opinions. Since participants are actively encouraged to not only express their own opinions, but also respond to other members and questions posed by the leader, focus groups offer a depth, nuance, and variety to the discussion that would not be available through surveys. Additionally, as FGDs are structured and directed, but also expressive, they can yield a lot of information in a relatively short time. Therefore, FGDs are a good way to gather in-depth information about a community's thoughts and opinions on a topic. The course of the discussion is usually planned in advance and most moderators rely on an outline, or guide, to ensure that all topics of interest are covered.

Key features of FGCs:

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Participatory Rural Appraisal (PRA)

Participatory rural appraisal (PRA) is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes.

Over the years techniques and tools have been described in a variety of books and newsletters, or taught at training courses. However, the field has been criticized for lacking a systematic evidence-based methodology.

The basic techniques used include:

- Understanding group dynamics, e.g. through learning contracts, role reversals, feedback sessions
- Surveying and sampling, e.g. transect walks, wealth ranking, social mapping
- Interviewing, e.g. focus group discussions, semi-structured interviews, triangulation
- Community mapping, e.g. Venn diagrams, matrix scoring, ecograms, timelines

To ensure that people are not excluded from participation, these techniques avoid writing wherever possible, relying instead on the tools of oral communication and visual communication such as pictures, symbols, physical objects and group memory. Efforts are made in many projects, however, to build a bridge to formal literacy; for example by teaching people how to sign their names or recognize their signatures. Often developing communities are reluctant to permit invasive audio-visual recording.

Stakeholder Analysis

When it comes to any organizational project, all of the internal people and teams who the project will involve or affect are called its stakeholders. A **stakeholder analysis** is a process of identifying these people before the project begins; grouping them according to their levels of participation, interest, and influence in the project; and determining how best to involve and communicate each of these stakeholder groups throughout.

SWOT Analysis

SWOT analysis is a framework for identifying and analyzing an organization's strengths, weaknesses, opportunities and threats -- which is what makes up the SWOT acronym. The primary goal of SWOT analysis is to aid organizations in increasing awareness of the factors in making a business decision. SWOT accomplishes this by analyzing the internal and external factors that can impact the viability of a decision.

SWOT analysis is most commonly used by business entities, but it is also used by nonprofit organizations and, to a lesser degree, individuals for personal assessment. Additionally, it can be used to assess initiatives, products or projects. As an example, CIO's could use SWOT to help create a strategic planning template. It also used in rural development to develop any region or rural region by SWOT analysis of that region.

The framework is credited to **Albert Humphrey**, who tested the approach in the **1960s** and **1970s** at the Stanford Research Institute. Developed for business and based on data from Fortune 500 companies, the SWOT analysis has been adopted by organizations of all types as an aid to making decisions.

Dependency ratio

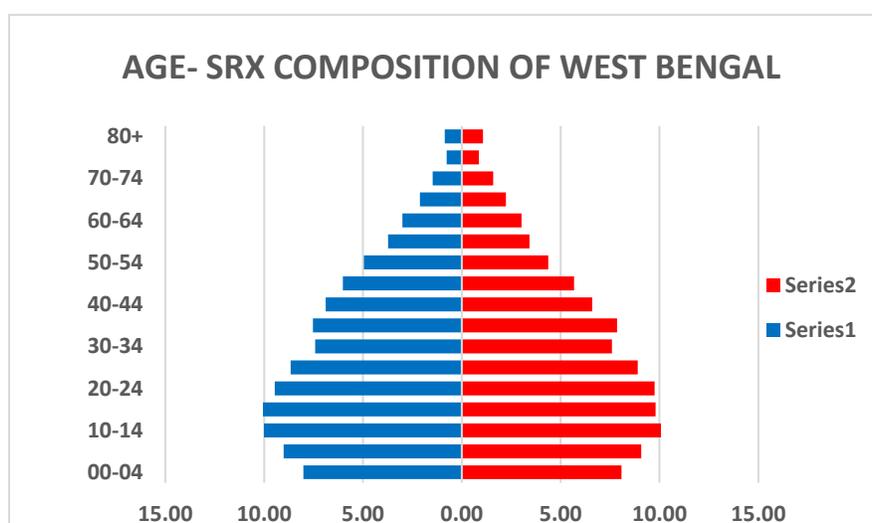
DEPENDENCY RATIO						
age group	male	female	total	age group specific total	age specific dependency ratio (%)	total dependency ratio (%)
00-04	3,743,862	3,589,281	7333143	24737475	40.26985609	47.69
05-09	4,216,763	4,031,046	8247809			
10-14	4,677,506	4,479,017	9156523			
15-19	4,702,325	4,355,706	9058031			
20-24	4,422,630	4,335,692	8758322	61429261		
25-29	4,044,904	3,953,005	7997909			
30-34	3,464,659	3,376,931	6841590			
35-39	3,523,361	3,489,285	7012646			
40-44	3,219,604	2,933,456	6153060			
45-49	2,814,212	2,521,507	5335719			
50-54	2,317,232	1,940,648	4257880			
55-59	1,746,903	1,521,747	3268650			
60-64	1,406,401	1,339,053	2745454			
65-69	991,280	991,713	1982993			
70-74	686,881	703,726	1390607			
75-79	360,216	379,551	739767			
80+	406,536	477,025	445803			
total	46,745,275	44,418,389	90725906			

Interpretation:

In the mentioned table dependency of rate of West Bengal. Dependency ratio is the percentage of dependent or non-working population that depends on the working population (15-65) for their financial need. The dependent population group belongs to mainly two age groups these are 00-14 and above 65+, population below 14 years are called child dependency ratio above 65 are called old dependency ratio. Here for West Bengal the child dependency ratio is 40.27 percentage and the old dependency ratio is 7.42 percentage. If we combine this two group of dependent population we get total dependency ratio which is 47.69 percentage.

Population composition

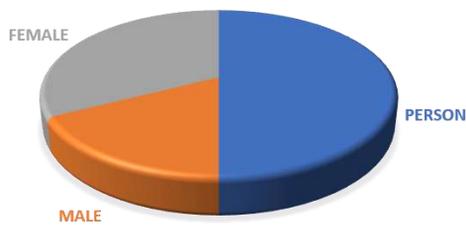
age group	male	female	total	% male	% female
00-04	3,743,862	3,589,281	7333143	-8.009070435	8.080619493
05-09	4,216,763	4,031,046	8247809	-9.020725624	9.075173798
10-14	4,677,506	4,479,017	9156523	-10.00637177	10.08369979
15-19	4,702,325	4,355,706	9058031	-10.0594659	9.806087294
20-24	4,422,630	4,335,692	8758322	-9.461127355	9.761029379
25-29	4,044,904	3,953,005	7997909	-8.653075632	8.899478547
30-34	3,464,659	3,376,931	6841590	-7.4117844	7.602551727
35-39	3,523,361	3,489,285	7012646	-7.537362867	7.855496515
40-44	3,219,604	2,933,456	6153060	-6.887549597	6.604147665
45-49	2,814,212	2,521,507	5335719	-6.020313283	5.676718712
50-54	2,317,232	1,940,648	4257880	-4.957147006	4.369019327
55-59	1,746,903	1,521,747	3268650	-3.737068613	3.425939198
60-64	1,406,401	1,339,053	2745454	-3.008648468	3.014636573
65-69	991,280	991,713	1982993	-2.120599355	2.232663143
70-74	686,881	703,726	1390607	-1.469412684	1.584312299
75-79	360,216	379,551	739767	-0.770593392	0.854490693
80+	406,536	477,025	445803	-0.86968362	1.073935842
total	46,745,275	44,418,389	90725906	-100	100



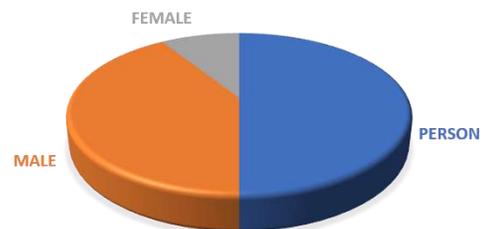
Occupation composition

PIE DIGRAM (OCCUPATIONAL STRUCTURE OF KOLKATA)			
		NUMBER	PERCENTAGE
TOTAL WORKER	PERSON	1795740	39.93
	MALE	1412466	59.93
	FEMALE	383274	17.91
MAIN WORKER	PERSON	1576419	35.06
	MALE	1294266	54.92
	FEMALE	282153	13.19
MARGINAL WORKER	PERSON	219321	4.88
	MALE	118200	5.02
	FEMALE	101121	4.73
NON-WORKER	PERSON	2700954	60.07
	MALE	944300	40.07
	FEMALE	1756654	82.09

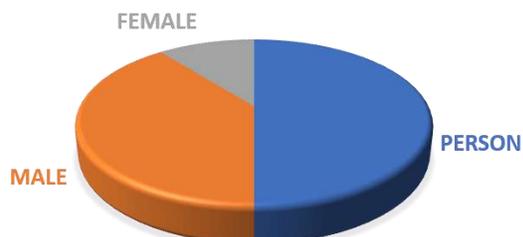
NON-WORKERS COMPOSITION OF KOLKATA



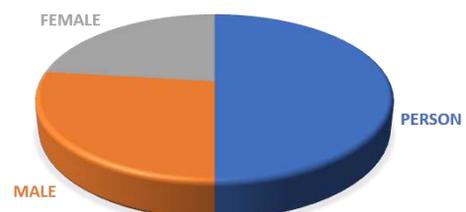
MAIN WORKER COMPOSITION OF KOLKATA



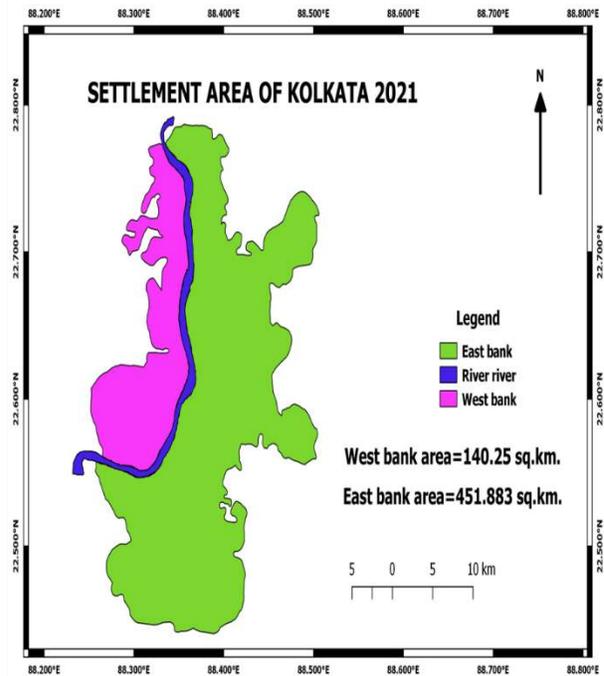
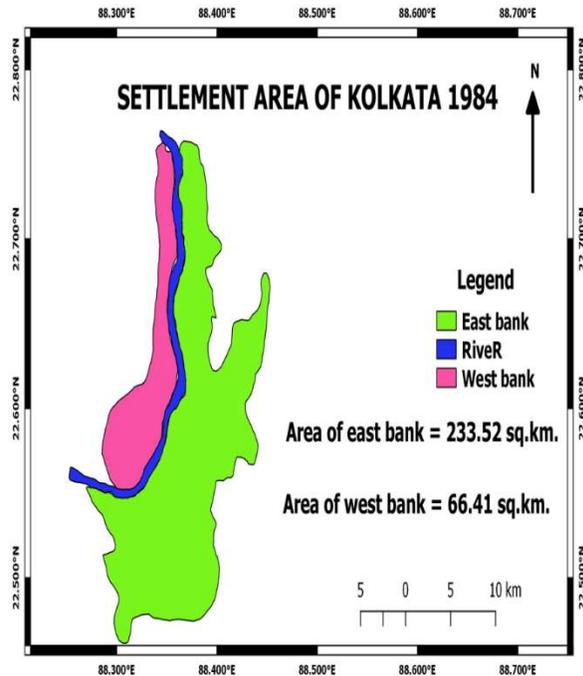
TOTAL WORKERS COMPOSITION OF KOLKATA



MARGINAL WORKER COMPOSITION OF KOLKATA



Human habitation and detection of change



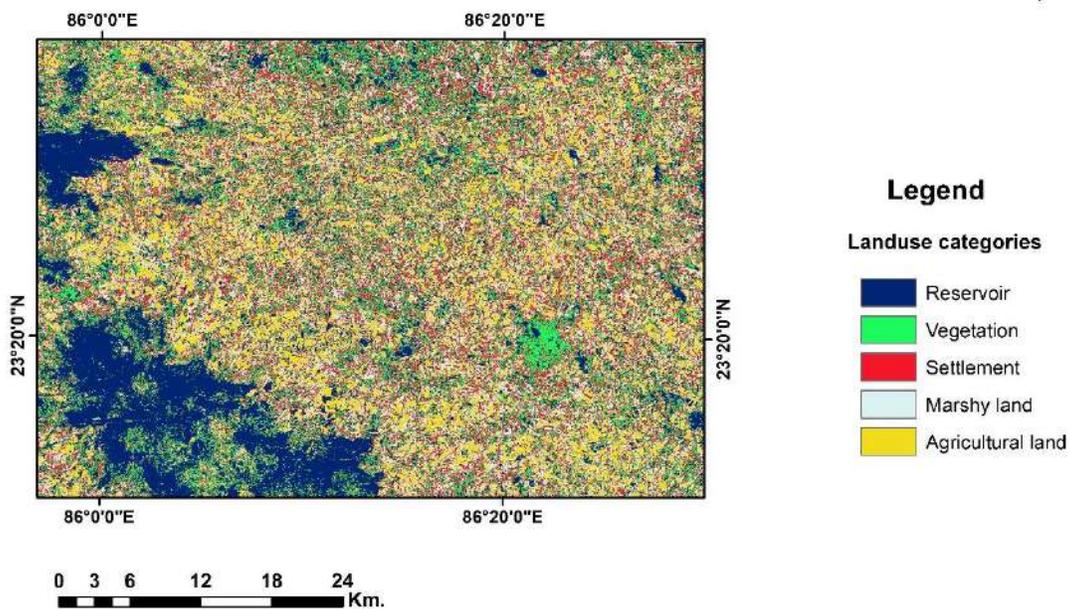
Interpretation:

In the two maps presented upon it depicting the change in settlement area in Kolkata city, capital of West Bengal. The change have been detected between 1984 to 2021. Between a long time of 37 years. the two images showing the expansion of Kolkata city have taken place in east bank of the Hugli river. In 1984 the settlement area of the west bank was 66.41 sq.km. and in 2021 it increased by 140.25sq.km. at a growth rate of 7.43%, on the other hand in settlement area in the east bank was in 233.2 sq.km. in 2021 it become 451.88 sq.km. with growth rate of 15.16% almost double than the west bank.

Land use map

Row Id	VALUE	COUNT	Area (%)	Land use units
0	1	115271	4.349641	Settlement
1	2	406199	15.32753	Reservoir
2	3	554870	20.93749	Vegetation
3	4	660826	24.93564	Marshy Land

Preparation of a simple landuse map

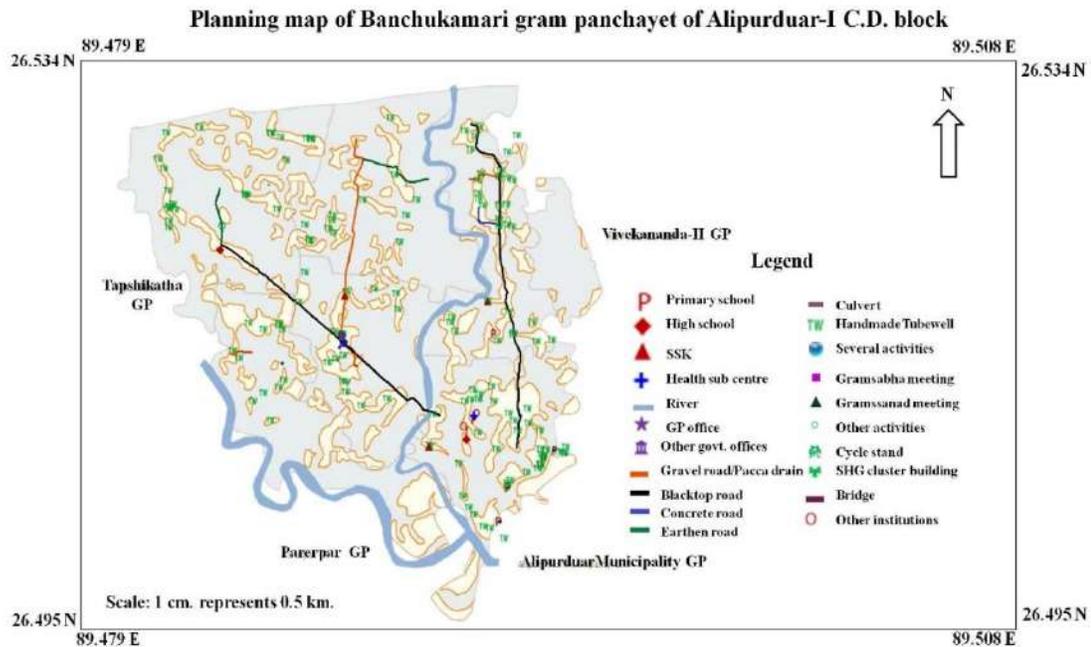


Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation:

Here we can see a land use map. Land use map is a kind of map which presents how the natural land are used by the humans. There is a basic difference between the land use and land cover map, where land use map are only depicts the land that are using by human or converted by the human, basically which is influenced by human intervention, like settlement, agricultural land, man made water body. on the other hand land cover maps represents how land is covered natural phenomenon like natural reservoirs, forest etc. In this image whole area are divided in 5 categories. Majority of the land is covered by marshy land which constitute about 25%, followed by 21% vegetation land, then comes settlement 15.32 at last 4.35.

Spatial Plan Formulation and Layout for a Gramm Panchayet



Interpretation:

Here in this map spatial plan have been formulate for the Gram Panchayet of Banchukamari in the district of Alipurduar, under the block Alipurduar-I. here various features have been detected that located in the GP, like schools, health centers, roads, etc. Here we can see that one river is flowing through the western boundary of the GP and another river dissecting the GP through the middle. Five primary schools are there and all of them are located in south-eastern part, there are also two high schools, three SSKs in the GP. Two health centers are there, if we take a look at the road connectivity

four minor major gravel roads, two major blacktop roads, two earthen roads and one minor concrete road.

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Semester: IV

Paper: Regional Planning and Rural Development Practical

Paper Code: GEOPDSE04P: B

Paper Type: Practical

UNIT 1: RURAL RESEARCH METHOD AND METHODOLOGY

1.1 PRE-FIELD ISSUES ON RURAL RESEARCH:

Contemporary research trends:-

Research Trends is an online publication providing objective insights into scientific trends based on bibliometrics analyses. Worldwide, there is a growing demand for quality research performance measurement and trend-related information by deans, faculty heads, researchers, funding bodies and ranking agencies.

This article highlights the exploration for contemporary research trends within technology management. Thereby, this paper primarily focuses on investigating research areas and issues connected with technology management in contemporary scientific publications selected from the Web of Science database. The results of the undertaken overview of the selected literature lead to a visualization of issues most frequently occurring in configuration with technology management, as well as the aspect of their coexistence in the analyzed compilation of literature. Along with the description of the conducted analysis, it constitutes a fundamental result of this work.

The main aim of the article is the identification and critical assessment of the most commonly used models and methods of measuring service quality. The last part is dedicated to the overview of measurement issues taking into account the specific features of logistics service. The paper was based on the research method of systematic literature review and critical analysis of research achievements. The article includes: (i) definitions of service quality, (ii) identification of the most popular models of service quality, (iii) overview of measuring methods of service quality, and (iv) the main research achievements on account of logistics service quality. This article aims to identify the trends and dynamics of changes in city logistics on the basis of bibliometric data of international literature published in the ISI Web of Science, Scopus, Elsevier, Emerald and EBSCO host databases in recent years. The study made use of basic techniques of the bibliometric method with the support of the VOS viewer software. On the basis of a huge number of literary works, the analysis allowed for the assessment in terms of chronological development of research concerning city logistics and the identification of main authors, publications, and journals being of crucial significance to this area of research.

Literature search on research problem stated:-

Literature search is a key step in performing good authentic research. It helps in formulating a research question and planning the study. Various databases are available for performing literature search. This article primarily stresses on how to formulate a research question, the various types and sources for literature search, which will help make your search specific and time-saving. Literature search is a systematic and well-organized search from the already published data to identify a breadth of good quality references on a specific topic.

[1] The reasons for conducting literature search are numerous that include drawing information for making evidence-based guidelines, a step in the research method and as part of academic assessment.

[2] However, the main purpose of a thorough literature search is to formulate a research question by evaluating the available literature with an eye on gaps still amenable to further research.

[3] Research problem is typically a topic of interest and of some familiarity to the researcher. It needs to be channelized by focusing on information yet to be explored. Once we have narrowed down the problem, seeking and analyzing existing literature may further straighten out the research approach.

[4] A research hypothesis is a carefully created testimony of how you expect the research to proceed. It is one of the most important tools which aid to answer the research question. It should be apt containing necessary components, and raise a question that can be tested and investigated.

The literature search can be exhaustive and time-consuming, but there are some simple steps which can help you plan and manage the process. The most important are formulating the research questions and planning for search.

A research problem, or phenomenon as it might be called in many forms of qualitative methodology, is the topic would you like to address, investigate, or study, whether descriptively or experimentally. It is the focus or reason for engaging in your research. It is typically a topic, phenomenon, challenge that you are interested in and with which you are at least somewhat familiar.

For example, when students encounter difficulties with word problems in math, teachers may initially think that students have not mastered the basic skills that would allow them to carry out the needed computations. However, the difficulty may actually lie in poor reading skill, which prevents the students from identifying the words in math problems. The students also might not understand or correctly interpret essential vocabulary.

Framing Research Question and Hypothesis:-

Framing a clear research question is a crucial part of developing your research proposal, and should be seen as emerging from a dialogue between a developing theoretical position and decisions you need to take about research design and subsequent data analysis.

Any empirical research—quantitative or qualitative—should be guided from the outset by a question or set of questions. The question defines precisely what is being examined and how an assessment of the results will be undertaken.

The research question begins with a research problem, an issue someone would like to know more about or a situation that needs to be changed or addressed, such as:

- Areas of concern
- Conditions that could be improved
- Difficulties that need to be eliminated
- Questions seeking answers

Characteristics of a good research question:

- The question is feasible.
- The question is clear.
- The question is significant.
- The question is ethical.

The feasibility of the question should guide not only the expression of the question but its conception. Feasibility should be foremost in the researcher's mind in the earliest stages of any project. Reviewers will always evaluate the feasibility of a question (possibly before other elements).

Clear expression signals clear thinking. Not only must the question be clear in the mind of the researcher, it must be articulated clearly. Again, reviewers of a manuscript will insist upon clear question so that the potential audience will be able to understand the question and, thus, follow the write-up of the project.

Significance may be said to be in the eye of the beholder. One way to gauge significance is to ascertain whether a reading audience will be able to take away a lesson from the project. Work that is very limited—say, to a single organization—may not be looked upon with favor by reviewers. If the question and the project are important enough that readers learn from the work, then it generally passes the significance test.

Research Questions and Research Hypotheses:

Research questions are formulated in conjunction with research hypotheses (also referred to as “conceptual hypotheses”). Importantly, researchers should formulate research questions and hypotheses at the same time; rarely if ever are research questions and research hypotheses done independently of each other. Indeed, the process presented in this class essentially requires that these two steps occur simultaneously. Research hypotheses serve a variety of purposes; however, most important at this stage of the research process is that research hypotheses help to “justify” whether a research question is sufficiently important to collect the data needed to answer it. If not, the question should be dropped. Another useful role of hypotheses is to help generate implied research questions. So although this topic is not covered just yet, bear in mind that research questions and research hypotheses work hand in hand and no discussion of research questions can be complete with incorporating research hypotheses into it.

Hypothesis:

Hypothesis is an assumption that is made on the basis of some evidence. This is the initial point of any investigation that translates the research questions into a prediction. It includes components like variables, population and the relation between the variables. A research hypothesis is a hypothesis that is used to test the relationship between two or more variables.

Sources of Hypothesis - Following are the sources of hypothesis:

- The resemblance between the phenomena.
- Observations from past studies, present-day experiences and from the competitors.
- Scientific theories.
- General patterns that influence the thinking process of people.

Types of Hypothesis - There are six forms of hypothesis and they are:

- Simple hypothesis
- Complex hypothesis

- Directional hypothesis
- Non-directional hypothesis
- Null hypothesis
- Associative and casual hypothesis.

Examples of Hypothesis - Following are the examples of hypothesis based on their types:

- Consumption of sugary drinks every day leads to obesity is an example of a simple hypothesis.
- All lilies have the same number of petals is an example of a null hypothesis.
- If a person gets 7 hours of sleep, then he will feel less fatigue than if he sleeps less.

Functions of Hypothesis - Following are the functions performed by the hypothesis:

- Hypothesis helps in making an observation and experiments possible.
- It becomes the start point for the investigation.
- Hypothesis helps in verifying the observations.
- It helps in directing the inquiries in the right directions.

Selected study area and target population:-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “A topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work”. Ideally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

There are few areas in business studies that can offer interesting topics due to their dynamic nature. The following is the list of research areas and topics that can prove to be insightful in terms of assisting you to choose our own dissertation topic.

The target population is the group of individuals that the intervention intends to conduct research in and draw conclusions from. Target population is an informal term used mostly in epidemiology. Its general defined to mean a group or set of elements that you want to know more information about.

Most of the time, “target population” and “population” are synonymous. However, adding the word target emphasizes that sometimes we miss the mark in sampling, and don’t always hit the mark: samples can be unrepresentative of the population that you originally intended to sample. For example, you might want to survey all the hospitalized adults in the United States (the target population), but budget constraints limit your survey to hospital patients just four cities in the U.S. The sampled population and targeted population in this scenario are likely to be quite different.

Target Population Units:

In some areas like regression analysis in epidemiology, it’s especially important to identify the target population. While data analysis in the sciences always includes the correct units (e.g. was time measured in seconds, decades, or light years?), specific information about the population is left out.

Identifying and collecting relevant secondary data:-

Secondary data is one of the two main types of data, where the second type is the primary data. These 2 data types are very useful in research and statistics, but for the sake of this article, we will be restricting our scope to secondary data.

Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

A data classified as secondary for a particular research may be said to be primary for another research. This is the case when a data is being reused, making it a primary data for the first research and secondary data for the second research it is being used for.

Sources of Secondary Data:

Sources of secondary data include books, personal sources, journal, newspaper, website, government record and many others. Secondary data are known to be readily available compared to that of primary data. It requires very little research and need for manpower to use these sources.

With the advent of electronic media and the internet, secondary data sources have become more easily accessible. Some of these sources are highlighted below.

Steps in Secondary Data Analysis:

Stepping Your Way through Effective Secondary Data Analysis

1. Determine your research question – As indicated above, knowing exactly what you are looking for.

2. Locating data– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.
3. Evaluating relevance of the data – Considering things like the data’s original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. Assessing credibility of the data – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.

Preparing survey schedule and questionnaire:

Every survey plan should include consideration of the following six areas: Survey Value. A survey usually originates when an individual or institution is confronted with a business problem and the existing data are insufficient. At this point, it is important to consider if the required information can be collected by a survey. If you need input from a number of people, must get results quickly, and need specific information to support business decisions, then a survey is the most appropriate technique.

Many studies start with a general hope that something interesting will emerge, and often end in frustration. A careful survey plan will help you focus your project, while guiding your implementation and analysis so the survey research is finished quicker. You can then concentrate on implementing well-supported decisions.

Questionnaire:

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. A research questionnaire is typically a mix of close-ended questions and open-ended questions. Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts.

The data collected from a data collection questionnaire can be both qualitative as well as quantitative in nature. A questionnaire may or may not be delivered in the form of a survey, but a survey always consists of a questionnaire.

Questionnaire Examples:

The best way to understand how questionnaires work is to see the types of questionnaires available. Some examples of a questionnaire are:

Customer Satisfaction Questionnaire - This type of research can be used in any situation where there’s an interaction between a customer and an organization. For example, you might send a customer satisfaction survey after someone eats at your restaurant. You can use the study to determine if your staff is offering excellent customer service and a positive overall experience.

Product Use Satisfaction Questionnaire - You can use this template to better understand your product's usage trends and similar products. This also allows you to collect customer preferences about the types of products they enjoy or want to see on the market.

Company Communications Evaluation Questionnaire - Unlike the other examples, a company communications evaluation looks at internal and external communications. It can be used to check if the policies of the organization are being enforced across the board, both with employees and clients.

Types of questionnaires:

As we explored before, questionnaires can be either structured or free-flowing. Let's take a closer look at what that entails for your surveys.

- *Structured Questionnaires* - Structured questionnaires collect quantitative data. The questionnaire is planned and designed to gather precise information. It also initiates a formal inquiry, supplements data, checks previously accumulated data, and helps validate any prior hypothesis.
- *Unstructured Questionnaires* - Unstructured questionnaires collect qualitative data. They use a basic structure and some branching questions but nothing that limits the responses of a respondent. The questions are more open-ended to collect specific data from participants.

Types of questions in a questionnaire:

Using various question types can help increase responses to your research questionnaire as they tend to keep participants more engaged.

- *Open-Ended Questions* - Open-ended questions help collect qualitative data in a questionnaire where the respondent can answer in a free form with little to no restrictions.
- *Dichotomous Questions* - The dichotomous question is generally a "yes/no" close-ended question. This question is usually used in case of the need for necessary validation. It is the most natural form of a questionnaire.
- *Multiple-Choice Questions* - Multiple-choice questions are a close-ended question type in which a respondent has to select one (single-select multiple-choice question) or many (multi-select multiple choice question) responses from a given list of options. The multiple-choice question consists of an incomplete stem (question), right answer or answers, incorrect answers, close alternatives, and distracters
- *Scaling Questions* - These questions are based on the principles of the four measurement scales – nominal, ordinal, interval, and ratio.
- *Pictorial Questions* - This question type is easy to use and encourages respondents to answer. It works similarly to a multiple-choice question. Respondents are asked a question, and the answer choices are images. This helps respondents choose an answer quickly without over-thinking their answers, giving you more accurate data.

Types of Questionnaires based on Distribution:

Steps in Making a Questionnaire:

§ Identify a theme with a theme; you can specify what data needs to be gathered and how these may be acquired in the form of a question.

§ Ask simple questions Be as specific as possible. Your respondents need to be able to answer each question without much deliberation.

§ Ask the same question in different ways There's always a chance that your respondent may be answering the questionnaire absentmindedly. To assess the reliability of such response, ask the same question several times but in different ways.

§ Choose a delivery method If you want to reach a wider audience, you can distribute your questionnaires through various social networks.

1.2 ISSUES ON FIELD RESEARCH:

PILOT STUDY:

A pilot survey is **a strategy used to test the questionnaire using a smaller sample compared to the planned sample size**. In this phase of conducting a survey, the questionnaire is administered to a percentage of the total sample population, or in more informal cases just to a convenience sample.

Advantages of a pilot survey:

Conducting a pilot survey prior to the actual, large-scale survey presents many benefits and advantages for the researcher. One of these is the exploration of the particular issues that may potentially have an antagonistic impact on the survey results. These issues include the appropriateness of questions to the target population. A pilot survey also tests the correctness of the instructions to be measured by whether all the respondents in the pilot sample are able to follow the directions as indicated. It also provides better information on whether the type of survey is effective in fulfilling the purpose of the study. Practically speaking, pilot surveys save financial resources because if errors are found in the questionnaire or interview early on, there would be a lesser chance of unreliable results or worse, that you would need to start over again after conducting the survey. All in all, the main objective of a pilot study is to determine whether conducting a large-scale survey is worth the effort.

Types of Pilot Survey:

A. According to Organization:

There are two types of pilot survey according to organization – external and internal. An external pilot survey intends to administer the questionnaire to a small group of target participants who will not be included in the

main survey. On the other hand, an internal pilot survey will consider the respondents in the pilot as the first participants in the main survey.

B. According to Respondent Participation:

There are two types of pilot survey according to the participation of the respondents – undeclared and participatory. In an undeclared pilot survey, you administer the survey to a certain number of respondents as if it is the real and full scale survey, not a pretest one. On the other hand, participatory pilot surveys involve informing the respondents that they are in the pre-test phase. The respondents are to be asked what they can say about the questionnaire, specifically their reactions, comments and suggestions. For instance, you may ask them about how clear the instructions are or which questions are hard to answer. Converse and Presser (1986) recommend using the participatory pilot survey first, and then conducting the undeclared pilot.

The Results of a Pilot Survey:

After obtaining and analyzing the results of the pilot survey, logistical, technical and other issues or problems can be addressed. The questionnaire or interview format can be revised, or the type of survey may be altered into a more suitable one. After the revision of the survey, the researcher may opt to conduct a second pilot survey to determine whether the errors and issues are effectively solved. If the problems were minor, then the large-scale survey can be executed.

ETHNOGRAPHIC FIELD DIARY:

Ethnographic research **involves the study of people in situ**. It involves the study of informants, their actions and their activities as they occur. Such an approach presupposes that the researcher can gain access to informants and their activities.

Ethnographers have devoted a great deal of attention on the issues of writing the final product of ethnographic research, the ethnographic research report. The issues related to the process of writing ethnographic field notes, however, have received much less attention in methodological discussions. Emerson et al. (1995) point out that even after the discovery of ‘writing’ as a central practice of ethnographic research (Clifford & Marcus 1986, Van Maanen 1988), field notes remained as ‘invisible work’ in ethnographic literature. They argue that while many ethnographers are uneasy with the messy, unfinished, and personal character of their field notes, these have mostly remained private documents. Remaining private documents, the impact of field notes on research findings and results has also left unexplored. Why should we pay more attention to field notes? Although there is no consensus concerning how ethnographic field notes should be written and what is their value in ethnographic research, most ethnographers (and many other qualitative researchers) produce some kind of field notes, particularly when doing observations. When planning and producing field notes in situ or after wards ethnographers continuously make choices about what to write down and how. Because it is impossible to collect data on everything and record all the things that are going on in the field, the researcher needs, by necessity, be selective in her writing. Furthermore, the researcher writes down her notes drawing from her sense making of the people, events and the situation and her interpretation can be different, or at least have different details and nuances, compared to another researchers’ field notes from the same situation. Field notes are important because they involve the critical acts of sense making and interpretation, which inevitably have some kind of bearing on the research findings and results. To be able to understand what kind of

bearing the field notes can have on your research, it is necessary to practice reflexivity in respect to one's own field notes and their analysis. In this chapter, we will answer to the request of taking written field notes and their analysis more seriously in ethnographic research. Our main objective is to open up and analyse the process of writing and analyzing ethnographic field notes. We will perform this through the investigation of our joint research project, which focused on business, technology and gender in the context of the Finnish ICT-sector. . In our investigation, we will practice reflexivity in terms of exploring the relationship between the researcher and the field, questioning the knowledge that is produced in field notes and in their analysis. More specifically, we will focus attention on how the social identities of the researchers affect how knowledge about the research subjects is produced and with kind of consequences. Our analysis elaborates two different modes of writing the field notes - selection and sense-making activities and textual practices of representation - and their implications on our research. In our analysis, we will pay close attention to the processes of exclusion, which take place through othering and marginalizing certain groups of actors involved in our research. With regards to selection and sense-making activities, we will ask what and who do we decide as 'important' and 'relevant' enough to be included into our field notes. We will also investigate why we considered some actors and events to be 'not-so-relevant' in relation to the goals of our project and how we justified these choices in our field notes. Through the analysis of our textual practices, we will further illustrate how and with what kinds of implications the 'relevant' and 'not-so-relevant' actors and encounters were crafted in our notes.

Longitudinal study:

In a longitudinal study, researchers repeatedly examine the same individuals to detect any changes that might occur over a period of time.

Longitudinal studies are a type of correlation research in which researchers observe and collect data on a number of variables without trying to influence those variables.

While they are most commonly used in medicine, economics, and epidemiology, longitudinal studies can also be found in the other social or medical sciences.

Case study:

The case study approach allows in-depth, multi-faceted explorations of complex issues in their real-life settings. The value of the case study approach is well recognized in the fields of business, law and policy, but somewhat less so in health services research. Based on our experiences of conducting several health-related case studies, we reflect on the different types of case study design, the specific research questions this approach can help answer, the data sources that tend to be used, and the particular advantages and disadvantages of employing this methodological approach. The paper concludes with key pointers to aid those designing and appraising proposals for conducting case study research, and a checklist to help readers assess the quality of case study reports.

ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA:

Data collection is central part of community health improvement efforts. Sometimes, the aim is to learn more about a problem as it is experienced by a specific group of people; other times it is to see if people are better off after participating in an intervention. Most data is collected through surveys, interviews, or observation. It's important to keep in mind the following when you collect data:

- It is good practice to let people know who you are (your name, organization and reason for collecting data when you ask them if they would like to participate. You should have permission from participants (people providing the data) and they should be made aware that their involvement is voluntary.
- Participants are free to withdraw from any active data collection or intervention program at any point without pressure or fear of retaliation. Avoid or minimize anything that will cause physical or emotional harm to participants.
- Make participants aware of any potential harm prior to their participation. Try to remain neutral and unbiased. Don't let your personal preconceptions or opinions interfere with the data collection process.
- Collecting data (i.e. through surveys) is often done under the assumption that information provided is confidential and the findings will be anonymous. You should let participants know when you will have to break confidentiality (e.g. in the case of harm to themselves or someone else) and whether results will be anonymous or not.
- When collecting data, try to avoid taking advantage of easy to access groups simply because they are there (this is called "convenience sampling"). Data should be collected from those that most help us answer our questions. Be respectful of people's time and when possible, compensate them for it.
- Be sure to protect the data you collect from people. Do not leave anything with personal information in a place that can easily be accessed by people who do not need to see the data (e.g. the back seat of your car). If possible, keep the information in a secure or locked location.
- After data are analyzed it is always good to share the results back to the participants. If anything on these guidelines is new to you, please consult with the NJHC's Data Committee. They can help design data collection activities that comply with these guidelines, and set you up to produce meaningful information for your workgroup.

1.3 FIELD TECHNIQUES

PARTICIPATORY RURAL APPRAISAL:

Participatory rural appraisal (PRA) is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes.

What is PRA process?

Participatory Rural Appraisal (PRA) is **a methodology used for interactive processes of social development**. It is a way of learning from people, with the people and by the people. It is, therefore, a methodology for analyses, planning, monitoring and evaluation.

"Participatory Rural Appraisal (PRA) recently renamed Participatory Learning for Action (PLA), is a methodological approach that is used to enable farmers to analyze their own situation and to develop a common perspective on natural resource management and agriculture at village level.

PRA is an assessment and learning process that empowers farmers to create the information base they need for participatory planning and action. Outsiders contribute facilitation skills and external information and opinions. Many different tools have been developed for use in PRA. There are four main classes: tools used in group and

team dynamics; tools for sampling; options for interviews and dialogue; and options for visualization and preparing diagrams. Most countries have had some experience with PRA and local publications are available. IIED regularly reports on new developments in its PLA notes (Pretty et al 1995)."

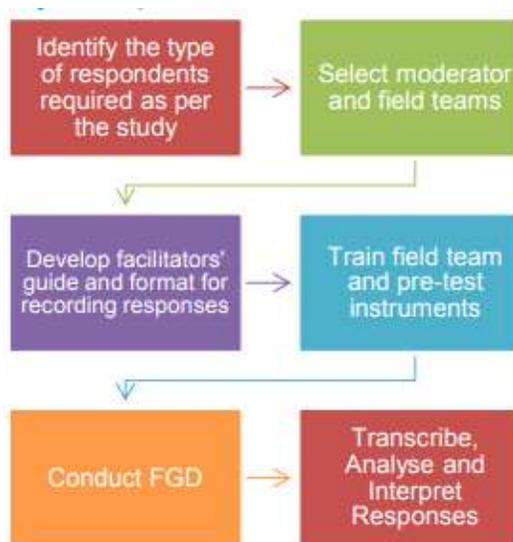
FOCUS GROUP DISCUSSION:

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Key Features of FGDs:

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Major steps involved in FGDs:



Advantages of focus groups:

Focus groups have several advantages for collecting qualitative research data. Focus group research can be used purely as a qualitative method or in combination with quantitative methods. Qualitative data collected in focus groups can help researchers decide what kinds of items to include in surveys. The moderator can inquire into and examine unforeseen issues with that arise in the context of the discussion. The format has a kind of face-validity and is naturalistic in that the discussion can include storytelling, joking, disagreements, and boasting. Running focus groups is straightforward and relatively expensive. Focus groups ordinarily consume less time than structured interviews, thus increasing sample sizes, lessening resource investment, and providing fast results. Focus groups tend to be more efficient when the data being gathered are related to the researcher's interests. They are helpful and important for needs assessments and project evaluations. A focus group discussion can create a synergy that can provide information that can't be gained in other ways. Vocabulary can be observed. New, insightful perspectives and opinions are obtained. Sensitive topics can be discussed, leading to personal disclosures.

1.4 POST FIELD TECHNIQUES:

TRANSCRIPTION FROM ETHNOGRAPHIC FIELD NOTES:

For researchers doing qualitative research, interviews are a commonly used method. Data collected through interviews can be recorded through field notes, transcripts, or tape recordings. In the literature, there is a debate regarding which of these recording methods should be used. There are issues of reliability, cost (time and money), loss of data, among others. Technology plays a pivotal role in this debate. Indeed, new technologies (e.g., direct coding) are often seen as potential replacements for older technologies (e.g., transcripts), which leads to a debate that is based on an evolution narrative (from field notes, to transcripts, to working from tape recordings). A combination narrative should be considered where combination is better than substitution. Moreover, combining the advantages of field notes, transcripts, and working from tape recordings without accumulating each method's disadvantages is possible because of new technology. Two technological tools (OneNote and SmartPen) are presented as a way to increase the effectiveness, efficiency, and economy of qualitative data management.

Fasick (1977) mentioned the cost and difficulties associated with transcripts. Indeed, although the equipment itself was quite cheap, the transcription process was not. Nevertheless, in the 1980s, transcripts were crucial because searching through cassettes was a cumbersome task and cassettes themselves were not permanent (i.e., tapes get damaged). Hence, producing a transcript was an essential step in translating recordings into searchable and analysable documents. To this effect, transcription techniques evolved and were refined to include as much information as possible in transcripts. Many notation systems were developed;

The invention of digital recorders made the transcript method even better for several reasons. First, digital files do not get damaged with time and backups are easily stored to ensure the integrity of the files. Thus, digital recorders provide unlimited "replayability." Second, software developed for digital sound files makes it easier to jump through interviews when searching for a specific excerpt. Hence, transcripts based on digital files allow for the data to be retrieved and examined in a more flexible manner (Heritage, 1984; Lapadat & Lindsay, 1999). Moreover, the accessibility of digital files means that recorded data can be reused and reanalysed in the context of another study because "the original data are neither idealized nor constrained by a specific research design or by reference to some particular theory or hypothesis" (Heritage, 1984)

Although Fasick (1977) originally doubted the usefulness of transcripts, they are now used extensively (Davidson, 2009), with a wide range of possibilities as to how transcripts are produced whether the transcript is

naturalised (writing that reflects words being said) or denaturalised (writing that reflects ideas being said) (Bucholtz, 2000). This is so, because transcripts have several advantages over field notes, one of which is the possibility of accessing, to a certain extent, the event itself in much more detail than field notes. As explained by Duranti International Journal of Qualitative Methods 2012, 11(4) 450 (1997), the ability to stop the flow of discourse allows researchers to focus on details, such as hesitations, restarts, and cut-offs in participants' speech (see also Hamo et al., 2004; Heritage, 1984; Silverman, 1993). Moreover, transcripts help prevent infatuation with the field, which occurs when researchers become too close to participants and their world, by providing physical and emotional distance between the researcher and the field (Hamo et al., 2004). Transcripts are therefore "an essential corrective to the limitations of intuition and recollection" (Heritage, 1984, p. 238). In short, transcripts are more complete and more reliable than field notes (Lapadat & Lindsay, 1999).

Transcripts, however, are not a perfect solution and have some problems such as cost and time as mentioned above (Fasick, 1977; Lapadat & Lindsay, 1999). Indeed, the amount of time required to produce transcripts is fairly important (Bertrand et al., 1992), and for every hour of taped interview, 6-7 hours of transcription is required (Britten, 1995). This time delay between the interview and the production of transcripts is a problem because it slows the progression of the research (Tilley, 2003).

PARTICIPANT OBSERVATION:

Participant observation is in some ways both the most natural and the most challenging of qualitative data collection methods. It connects the researcher to the most basic of human experiences, discovering through immersion and participation the hows and whys of human behavior in a particular context. Such discovery is natural in that all of us have done this repeatedly throughout our lives, learning what it means to be members of our own families, our ethnic and national cultures, our work groups, and our personal circles and associations. The challenge of harnessing this innate capability for participant observation is that when we are participant observers in a more formal sense, we must, at least a little, systematize and organize an inherently fluid process. This means not only being a player in a particular social milieu but also fulfilling the role of researcher—taking notes; recording voices, sounds, and images; and asking questions that are designed to uncover the meaning behind the behaviors. Additionally, in many cases, we are trying to discover and analyze aspects of social scenes that use rules and norms that the participants may experience without explicitly talking about, that operate on automatic or subconscious levels, or are even officially off limits for discussion or taboo. The result of this discovery and systemization is that we not only make ourselves into acceptable participants in some venue but also generate data that can meaningfully add to our collective understanding of human experience.

Participant observation is used across the social sciences, as well as in various forms of commercial, public policy, and nonprofit research. Anthropology and sociology, in particular, have relied on participant observation for many of their seminal 76 insights, and for most anthropologists and many sociologists, doing a participant observation study at a field site is an important rite of passage into the discipline. Bronislaw Malinowski's (1922) work among the Trobriand Islanders is not only one of the foundational works of ethnography, but it is also one of the earliest to both exemplify and articulate the value of participant observation. Sociologists also conducted participant observation studies and discussed the use of the technique early on, including Beatrice Webb (1926) in the 1880s and the Chicago school of urban sociologists in the 1920s (Park, Burgess, & McKenzie, 1925)

THE ROLE OF PARTICIPANT OBSERVATION IN THE RESEARCH PROCESS:

The most traditional use of participant observation is at the exploratory stages of the research on a new topic, culture, venue, or behavior. In these situations, it is hard to beat participant observation for the sheer volume of

insight and information that can be collected. Spending time working, playing, or living with people will produce data that would require dozens of interviews or focus groups to uncover. And, as indicated in the example of Koester's IV drug user research, there are often findings that might be completely missed using other methods.

But participant observation can also play an important role when examining topics where there is already a considerable body of knowledge. As with other qualitative methods, participant observation can often help explain quantitative findings by providing the contextual meaning behind other data. In these cases, the participant observation may occur after or at the same time as other forms of data collection, such as analysis of secondary data or a quantitative survey. The participant observation may be used to explain apparent contradictions in other data—as work, to learn the causal relationship behind a numerically observed correlation—or to confirm or gain face validity (sometimes referred to as triangulation) for the findings produced by another research method.

The ability of participant observation to provide explanation, context, causation, and confirmation means that it is often a useful element to include in a mixed method study. As indicated above, the participant observation may occur at multiple stages of the research—either early on as an exploratory element or later as an explanatory or confirmatory element.

Unit: 3 Techniques and formulation of Rural Planning through Data Analysis

3.1 APPLICATION OF QUALITATIVE RESEARCH TECHNIQUES

STAKEHOLDER ANALYSIS

Stakeholder analysis is an extremely useful technique for identifying, understanding, and prioritizing all stakeholders who may wield influence or power over a business or project.

Among other things, analyzing stakeholders will reveal who they are, what their needs and expectations may be, and what issues matter to them (and to what degree). Just as importantly, this exercise will tell you their true level of interest and/or influence over your project.

A thorough analysis will ensure that all affected parties are duly considered. Having access to this knowledge can greatly improve the outcomes of conflict resolution. It can also make your day-to-day stakeholder engagement efforts much more targeted.

WHY ANALYZE STAKEHOLDERS?

Not all stakeholders deserve the same amount of attention.

This is why conducting stakeholder analysis is so beneficial. It allows you to properly identify all stakeholders and to categorize them in order of importance as it pertains to your efforts to secure social acceptance and ensure successful project delivery.

More specifically, this analysis will tell you the interests of all stakeholders who may impact or be impacted by the project, the attributes of project advocates and opponents, as well as the interrelationships and interfaces that exist between them.

In other words, it will tell you how these different groups interact and how this interaction may be serving or jeopardizing your interests.

During your stakeholder analysis, you'll also uncover any potential risks, issues or misunderstanding that could disrupt the project. This information is vital for knowing what type of communication and messaging will best help to minimize perceived negative impacts and amplify positive impacts.

Stakeholder analysis will identify who exactly you should be engaging, informing and/or encouraging participating during the project's execution phase – and to what extent.

This valuable information should serve as the foundation for your stakeholder management strategy and messaging. When performed on an ongoing basis, stakeholder analysis will also tell you how your key stakeholder groups are changing over time – in terms of who they are, how their needs or expectations may be evolving and how your relationship with them has improved – or deteriorated.

This article explores the different types of stakeholder analysis, what elements they have in common and what the benefits of conducting ongoing stakeholder analysis are. (Hint: It has to do with classifying stakeholders based on their influence and power and then understanding their motivations so that you can prioritize your efforts and resources accordingly to achieve the desired outcomes).

HOW TO IDENTIFY STAKEHOLDERS?

Stakeholders can be identified in a number of ways:

Team brainstorming:The idea here is to come up with the longest possible list of potential Not all suggestions will be retained but reserve judgment for the end. It's better to weed out than to overlook.

Team members' experience: Chances are your team has built up valuable knowledge over time, so be sure to tap into it.

Historical data:Your organization may have accumulated piles of data from previous projects. Using this data to inform your stakeholder analysis simply makes sense as it promotes efficiency and building on experience.

Comparable:Sometimes you'll be operating in a new location or on a different type of project. Whenever possible, look for similar projects and identify stakeholders who may have played a key role. Chances are the same types of stakeholders will impact (or be impacted by) your current project.

The more approaches you use, the less likely you are to overlook key stakeholders

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME:

SWOT Analysis: A parameter to examine the growth and performance of women entrepreneurs' development in India.

STRENGTH

Women entrepreneur can be defined as a confident, innovative and creative women capable of achieving self economic independence individually or in collaboration, generate employment opportunities for others through initiating, establishing and running the enterprise by keeping pace with her personal, family and social life.

Women prefer to work from their own residence, difficulty in getting suitable jobs and desire for social recognition motivates them self-employment.

WEAKNESSES

Absence of proper support, cooperation and back-up for women by their own family members and the outside world people force them to drop the idea of excelling in the enterprise field.

Women's family obligations also bar them from becoming successful entrepreneurs in both developed and developing nations.

Achievement motivation of the women folk found less compared to male members. The greatest deterrent to women entrepreneurs is that they are women.

Opportunity

Women inculcate entrepreneurial values and involve greatly in business dealings.

Business opportunities that are approaching for women entrepreneurs are eco-friendly technology, Bio-technology, IT enabled enterprises, event management, tourist industry, Telecommunication, Plastic materials, Mineral water, Herbal & health care, Food, fruits and vegetables processing.

Women entrepreneurs avail new opportunities in the rural areas such as Ice cream, channel products, papads and pickles and Readymade garments.

THREATS

Fear of expansion and Lack of access to technology

Lack of self-confidence, will power, strong mental outlook and optimistic attitude amongst women creates a fear from committing mistakes while doing their piece of work.

Credit discrimination and Non Cooperative officials.

Insecure and poor infrastructure and Dealing with male laborers. Indian women give emphasis to family ties and relationships.

3.2 APPLICATION OF STATISTICAL TECHNIQUES IN DEMOGRAPHIC DATA ANALYSIS:

POPULATION COMPOSITION

Population Composition Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

AGE SEX STRUCTURE

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

SEX RATIO

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males

POPULATION PYRAMID

The Sex Ratio both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

Age Group	Male	Female	Total	Percentage of male	Percentage of female
00-04	37,43,862	35,89,281	73,33,143	-8%	8%
05-09	42,16,763	40,31,046	82,47,809	-9%	9%
10-14	46,77,506	44,79,017	91,56,523	-10%	10%
15-19	47,02,325	43,55,706	90,58,031	-10%	10%
20-24	44,22,630	43,35,692	87,58,322	-9%	10%
25-29	40,44,904	39,53,005	79,97,909	-9%	9%
30-34	34,64,659	33,76,931	68,41,590	-7%	8%
35-39	35,23,361	34,89,285	70,12,646	-8%	8%
40-44	32,19,604	29,33,456	61,53,060	-7%	7%
45-49	28,14,212	25,21,507	53,35,719	-6%	6%
50-54	23,17,232	19,40,648	42,57,880	-5%	4%
55-59	17,46,903	15,21,747	32,68,650	-4%	3%
60-64	14,06,401	13,39,053	27,45,454	-3%	3%
65-69	9,91,280	9,91,713	19,82,993	-2%	2%
70-74	6,86,881	7,03,726	13,90,607	-1%	2%
75-79	3,60,216	3,79,551	7,39,767	-1%	1%
80+	4,06,536	4,77,025	8,83,561	-1%	1%
Total	4,67,45,275	4,44,18,389	9,11,63,664		

OCCUPATIONAL STRUCTURE

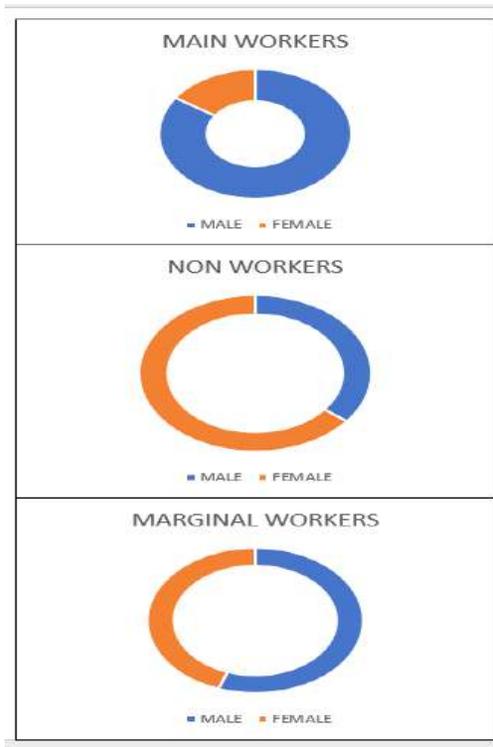
The occupational structure of a nation refers to the percentage of its workforce employed in various economic ventures. To put it in other words, articulating the number of the total working population employed in agriculture and associated activities and the number of them involved in the manufacturing and service sectors can be identified from the occupational structure of the nation.

SIGNIFICANCE

- It reflects the close relationship between economic development and occupational structure.
- It gives proper illustration of ratio and spatial distribution of working and non-working population.
- This relevant data have its own utility and role in policy making
- The proportion of workers engaged in various occupation highlights economic and cultural development.
- The significance of occupational distribution of population of a region lies in the fact that, it clearly reveals the socio-economic characteristics of the people living that particular region. It is, hence, one of the important measures of socio-economic development of the country.

OCCUPATIONAL STRUCTURE OF KOLKATA (WEST BENGAL, CENSUS 2011).

WORKERS AND NONWORKERS			
	MALE	FEMALE	TOTAL
MAIN WORKERS	21678279	4008351	25686630
MARGINAL WORKERS	5037768	4031957	9069725
NON WORKERS	20092980	36426780	56519760



INTERPRETATION

We have shown occupational structure of Kolkata (census 2011) by these three-pie diagram. These diagrams have shown proportion of main workers, non-workers and marginal workers. The proportion of male workers are higher than the females in main and marginal working groups and number of females are high in non-working groups. In another pie the proportion of marginal working population is lower than main and non-working population.

CATEGORY OF WORKERS (MAIN & MARGINAL) (WEST BENGAL, CENSUS 2011)

	MALE	FEMALE	TOTAL
CULTIVATORS	4500041	616647	5116688
AGRICULTURAL LABOURERS	7452814	2736028	10122842
HOUSEHOLD WORKERS	1114683	1349441	2464124
OTHER WORKERS	13648509	3338192	16986701

INTERPRETATION

We have shown category of workers (main & marginal workers) of Kolkata (census 2011) these pie diagram. These diagrams have shown proportion of cultivators, agricultural labourers, household workers & other workers. The proportion of others workers are higher than the cultivators, agricultural labourers and household working groups. The proportion of household workers are lower than the cultivators, agricultural labourers and others working groups.

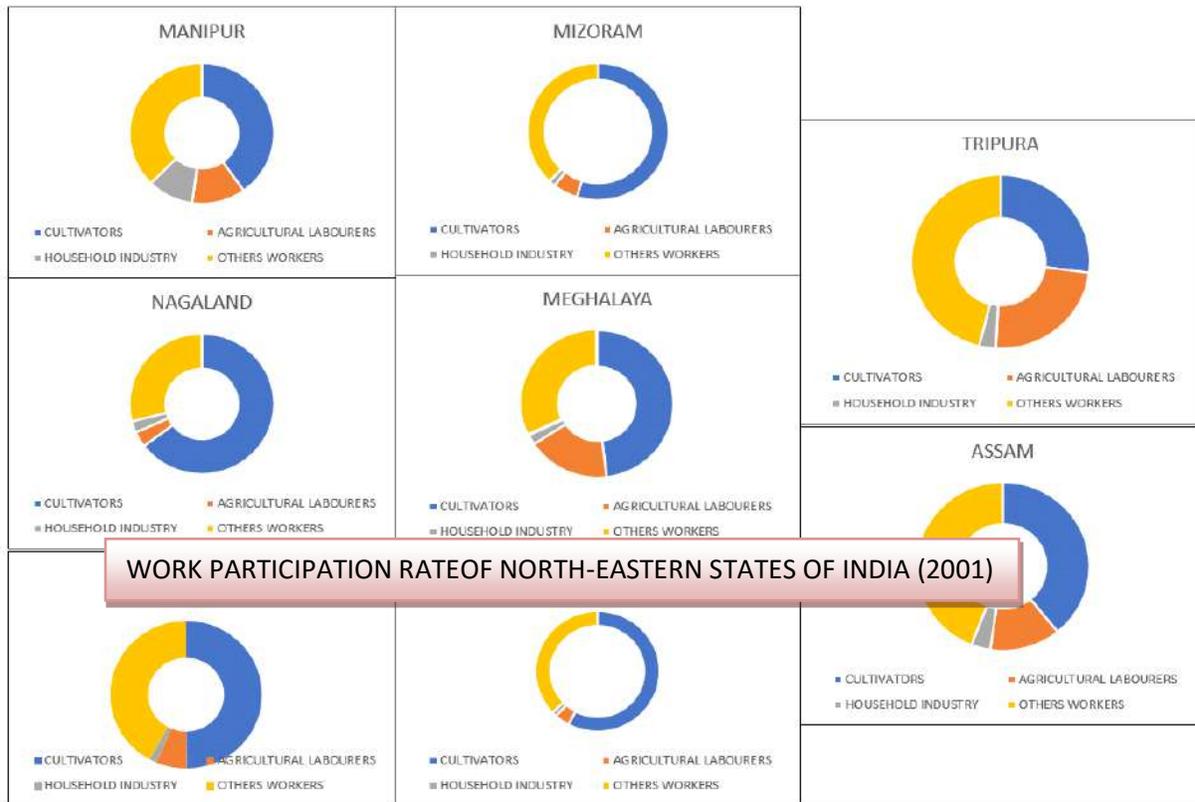
INDUSTRIAL COMPOSITION, NORTH INDIAN STATES , 2001

STATES/UNION TERRITORY	CULTIVATORS	AGRICULTURAL LABOURERS	HOUSEHOLD INDUSTRY	OTHERS WORKERS
ASSAM	39.1	13.2	3.6	44
MEGHALAYA	48.1	17.7	2.2	32
MANIPUR	40.2	12	10.3	37.6
MIZORAM	54.9	5.7	1.5	37.9
NAGALAND	64.7	3.6	2.6	29
TRIPURA	27	23.8	3	46.1
ARUNACHAL PRADESH	57.8	3.9	1.3	37
SIKKIM	49.9	6.5	1.6	42
TOTAL	381.7	86.4	26.1	305.6

INTERPRITATION

We shown

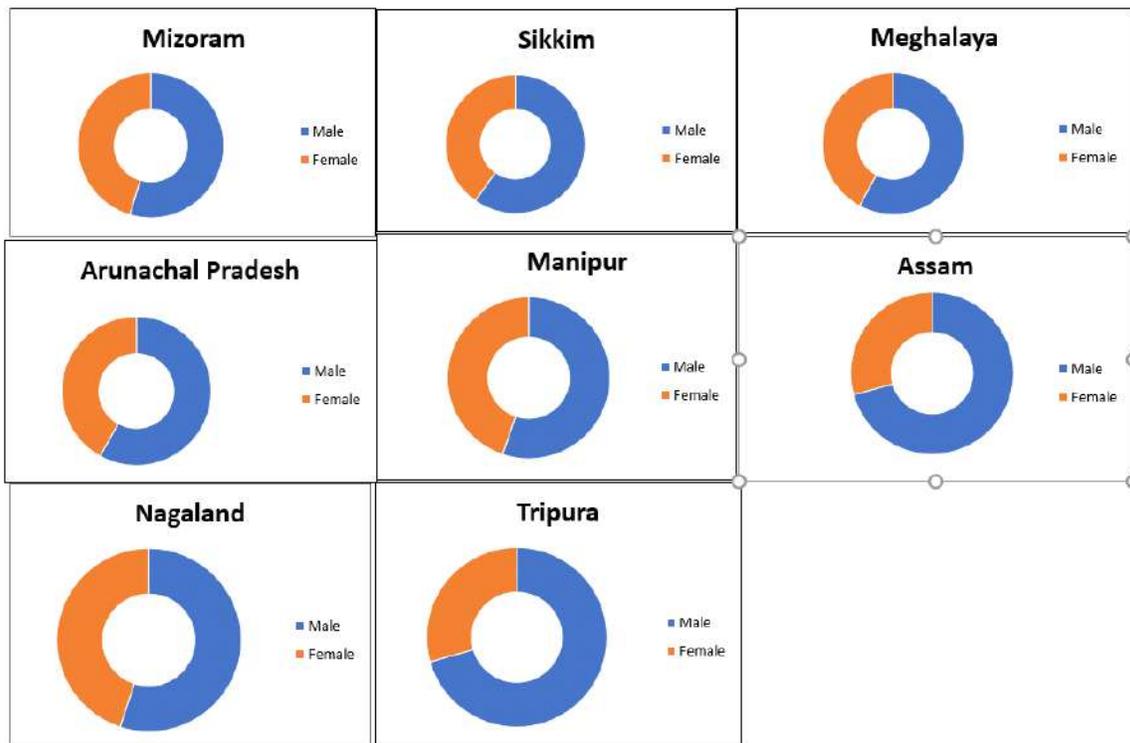
have



industrial composition of North Indian States in 2001 by these pie-diagram. These diagrams have shown proportion of cultivators, agricultural labourers, household workers & other workers. The proportion of cultivators are higher than agricultural labourers, household workers & other workers in Mizoram, Nagaland, Meghalaya, Sikkim & Arunachal Pradesh. In another pie the proportion of other workers are higher than cultivators, agricultural labourers & household workers in Tripura & Assam. In another pie the proportion of cultivators and other workers are equal than agricultural labourers & household workers in Manipur.

WORK PARTICIPATION RATE OF THE NORTH-EASTERN STATES OF INDIA (2001)

India: Work Participation Rate North-Eastern States (2001)			
State	Male	Female	
Mizoram	57.3	47.5	
Sikkim	57.4	38.6	
Arunachal	50.6	36.5	
Manipur	48.1	39	
Nagaland	46.7	38.1	
Meghalaya	48.3	35.1	
Tripura	50.6	21.1	
Assam	49.9	20.7	
Total	408.9	276.6	



INTERPRETATION

We have shown work participation rate of North-Indian States in 2001 by these pie-diagram. These diagrams have shown proportion of male & female person. The proportion of male person are higher than female person in North-Eastern States.

DEPENDENCY RATIO

The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

The total (or Age) dependency ratio is the ratio of the sum of the population aged 0-14 and that aged 65+ to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

The child dependency ratio is the ratio of the population aged 0-14 to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

The old-age dependency ratio is the ratio of the population aged 65 years or over to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

In published international statistics, the dependent part usually includes those under the age of 15 and over the age of 64. The productive part makes up the population in between, ages 15-64. It is normally expressed as a percentage:

$$\begin{aligned} \text{(Total) Dependency ratio} = & \left[\frac{\text{number of people aged 0 to 14} \right. \\ & \left. + \text{number of people aged 65} \right. \\ & \left. \text{and over} \right] / \text{number of people aged} \\ & \text{15 to 64} \times 100 \end{aligned}$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. This results in direct impacts on financial expenditures on things like social security, as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and the aged dependency ratio :

$$\begin{aligned} \text{Child dependency ratio} = & \left[\frac{\text{number of people aged 0 to 14}}{\right. \\ & \left. \text{Number of people aged 15 to 64}} \right] \\ & \times 100 \end{aligned}$$

$$\begin{aligned} \text{Aged dependency ratio} = & \frac{\text{number of people aged 65 or over}}{\text{Number of people aged 15 to 64}} \\ & \times 100 \end{aligned}$$

Age Group	Male	Female	Total				
00-04	37,43,862	35,89,281	7333143				
05-09	42,16,763	40,31,046	8247809	24737475			
10-14	46,77,506	44,79,017	9156523				
15-19	47,02,325	43,55,706	9058031	40.26986			
20-24	44,22,630	43,35,692	8758322				
25-29	40,44,904	39,53,005	7997909				
30-34	34,64,659	33,76,931	6841590				
35-39	35,23,361	34,89,285	7012646	61429261			47.69168
40-44	32,19,604	29,33,456	6153060				
45-49	28,14,212	25,21,507	5335719				
50-54	23,17,232	19,40,648	4257880			47.69168	
55-59	17,46,903	15,21,747	3268650				
60-64	14,06,401	13,39,053	2745454				
65-69	9,91,280	9,91,713	1982993				
70-74	6,86,881	7,03,726	1390607	7.421821			
75-79	3,60,216	3,79,551	739767	4559170			
80+	4,06,536	4,77,025	445803				
Total	4,67,45,275	4,44,18,389	90725906				

MIGRATION:

1. Population of Madras, 1951 = p_t =	1,416,056
2. Population of Madras, 1961 = p_{t+1} =	1,729,141
3. Increase in population, 1951-1961 = (2) - (1) =	313,085
4. Number of births in Madras, 1951-1961 = B =	653,190
5. Number of deaths in Madras, 1951-1961 = D =	371,286
6. Natural increase in Madras, 1951-1961 = (4) - (5) =	281,904
7. Net migration to Madras, 1951-1961 = (3) - (6) =	31,181

SOURCE: The population figures are taken from *Census of India*, vol. IX, *Madras*, part II-A. The figures of births and deaths are taken from *Vital Statistics of India, 1962*, issued by the Registrar General, India.

The phenomenon of migration is at the center of the major challenges of the twenty-first century, as evidenced by the intensity of the international agenda on the issue. Indeed, there has been a multiplication of high-level meetings sanctioned by important resolutions that have emphasized the need for international cooperation in response to migration. The holding of the World Summit on International Migration and Development in New York in September 2006 marks a decisive turning point in the integration of migration into development strategies, policies and programs. Thus, since 2007, a global forum on migration and development has been held annually. Is it also important to underline the Rabat Process (Morocco) as a framework for dialogue on migration, which periodically organizes Euro-African Ministerial Conferences on Migration and Development, the most recent of which held in Rome / Italy on 27 November 2014, adopted a declaration and its annex, the Rome program.

The main objective of this presentation is to describe the different measures of migration by reviewing the definitions and concepts as well as the difficulties associated with studies on migration and migration typologies.

Measurement of migration:

Cross sectional measures: migration rates

- Let M be the number of migrations (inputs and outputs) observed in a population over a period of n years in a region i.
- Let P0 et Pn be the population at beginning and en of period
- The gross migration m is given by :

$$m = \frac{M}{\frac{n}{2}(P_0 + P_n)} \quad k$$

k = 100, 1000 ou 10000

- In the same way, the gross emigration rate (or exit index) of an area i is calculated :

$$m_{ia} = \frac{M^{ai}}{\frac{n}{2}(P_0^i + P_n^i)} \quad k$$

- In the same way, one calculates the gross rate of immigration (or index of entry) of a zone i :

$$m_{ai} = \frac{M^{ai}}{\frac{n}{2}(P_0^i + P_n^i)} \quad k$$

Longitudinal measures: mobility quotient

- The net rate of migration

$$m_{ai} - m_{ia} = \frac{M^{ai} - M^{ia}}{\frac{n}{2}(P_0^i + P_n^i)} \quad k$$

- Emigration quotient

$$e_x = \frac{E_x}{S_x + \frac{I_x - D_x}{2}}$$

ex = quotient of emigration at the exact age x

Sx = survivor at exact age x

Ex = emigration at the end o age x

I x = Immigration at the correct age x

Dx = Deaths at full age x

Indirect measures of mobility

- natural movement method : This method make it possible to estimate the number of migrants.
- For net migration by age the formula gives :

$$P_{i(x)}^r = P_{i(x)}^o + N_{i(x)} - D_{i(x)} + M_{ai(x)} - M_{ia(x)}$$

- The net balance of international migrants can therefore also be calculated if the number of international migrants is available through this formula :

$$M_{ai(x)} - M_{ia(x)} = P_{i(x)}^r - P_{i(x)}^o - N_{i(x)} + D_{i(x)}$$

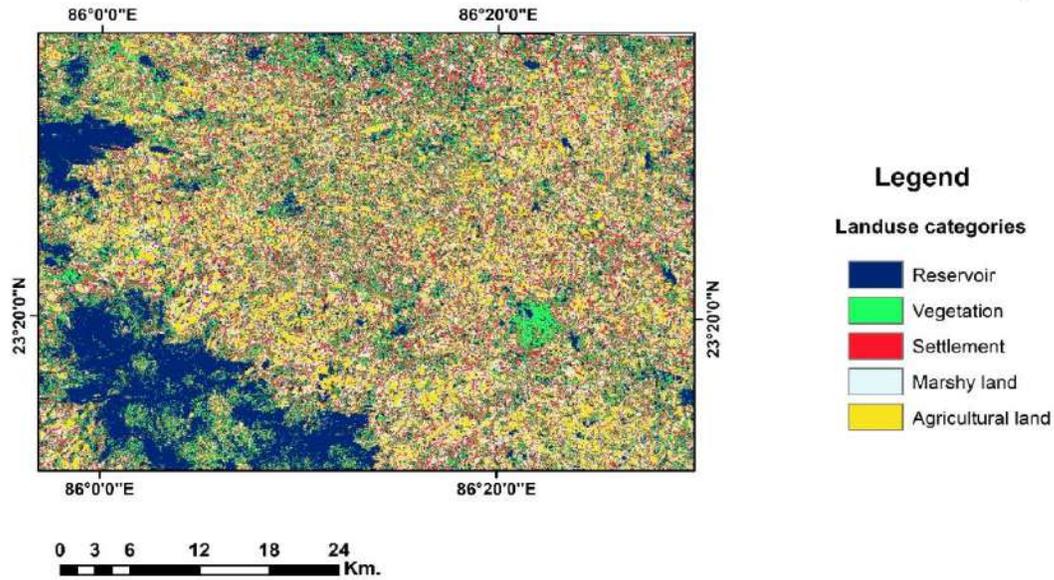
3.3 APPLICATION OF GIS AND RS:

Land use mapping

City planners need to know which areas of a city are used for which purpose. Therefore, they produce a map of "land use", that identifies parts of a city and the major activities (land use) that happen there. Remote sensing imagery is very useful for this purpose, since you certainly don't want to spend many weeks or months walking or driving around a city to map its land use. But to use remote sensing imagery effectively, you have to be able to interpret it accurately.

The satellite image in this activity shows a part of downtown Montreal. It will be a bit harder to interpret this black and white image, because you don't have colour clues to rely on. But you can see quite a bit of spatial detail - even individual streets and large buildings.

Preparation of a simple landuse map



Base Information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Rowid	VALUE	COUNT	Area	Landuse_units
0	1	115271	4.349641	Settlement
1	2	406199	15.32753	Reservoir
2	3	554870	20.93749	Vegetation
3	4	660826	24.93564	Marshy Land
4	5	912961	34.44971	Agricultural land
		2650127	100	

INTERPRETAION:

This is a landuse map of Eastern part of Bankura, and there latitudinal and longitudinal extention are 86 0' e and 86 20'e and 23 20n. In this landuse map a huge percentage of land is used as agricultural land about 34.44971%, 24.93564% of marshy land, 20.93749% of vegetation cover and 15.32753% of reservoir and only 4.34% land used for settlement purpose.

MAPPING OF HUMAN HABITATION AND DETECTION OF CHANGE FROM MULTIDATED MAPS AND / OR IMAGES

Calculation for human habitation change from (1984-2020)

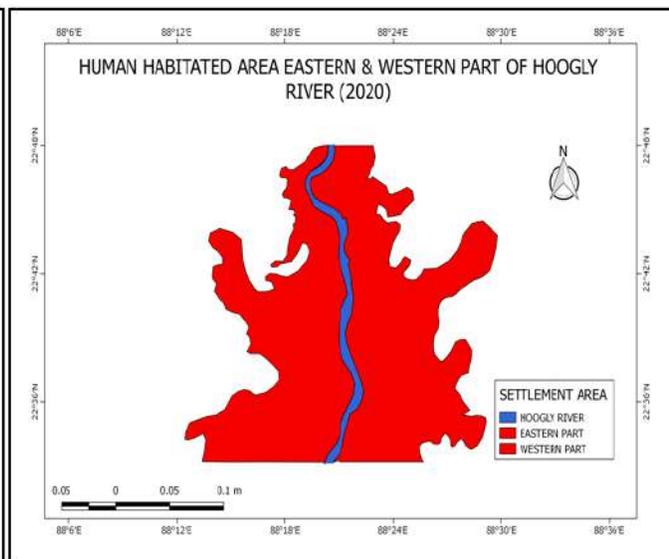
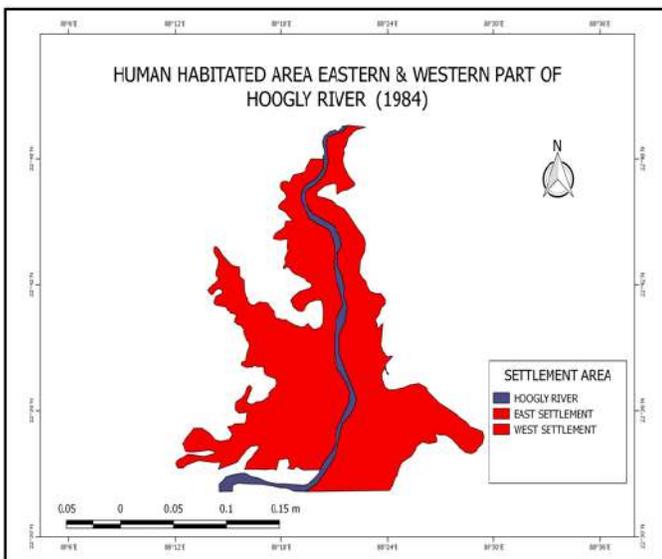
Settlement area of 2020 - Settlement area of 1984

***100**

Settlement area of 1984

East= $\frac{1.283589-2.142077}{1.283589} * 100$

West= $\frac{1.708509-1.883469}{1.708509} * 100$



	1984	2020
EAST BANK	1.283589912	2.142077
WEST BANK	1.708509	1.883469

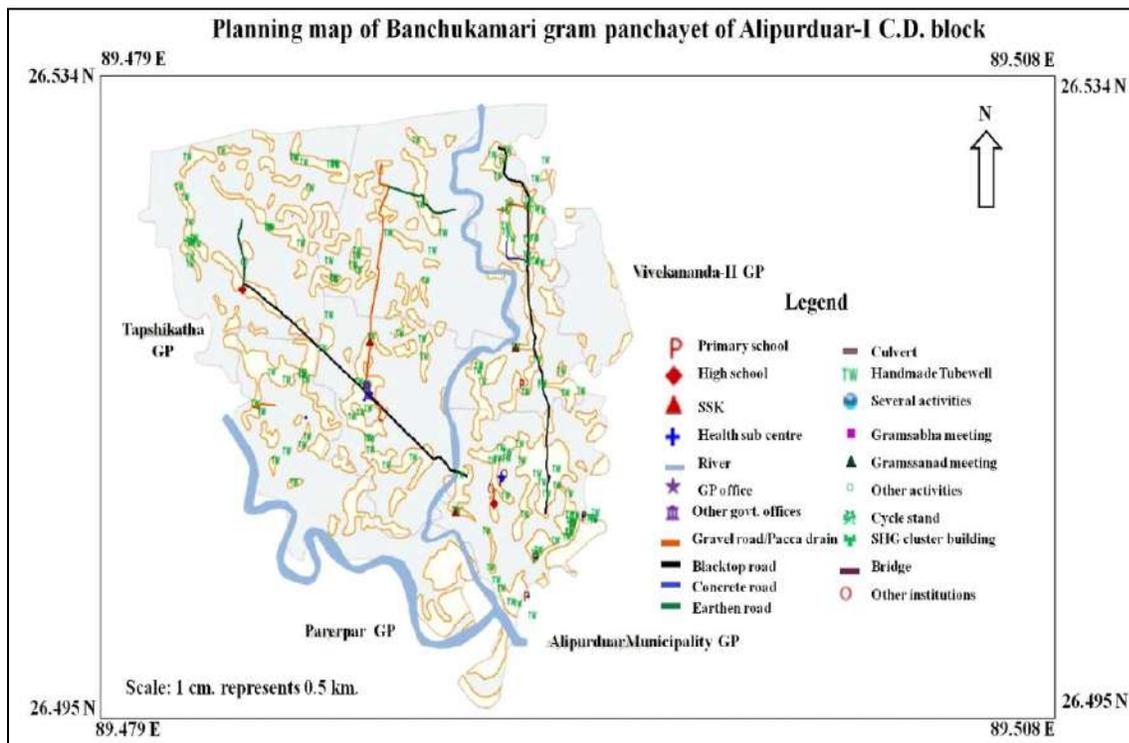
INTERPRETATION:

Here we have prepared two thematic maps which shows the comparative analysis of habitation of two sides of Hooghly river between 1984 and 2020. The settlement density in the eastern part of Hooghly river was sq.km in 1984, it has changed about 66.88% in the past 4 decades. Where as in the same period of time the settlement density in the western part of the Hooghly river has changed only 10.24% .

SPATIAL PLAN FORMULARION:

The use of the term spatial planning to describe the activities, processes, practices and the accompanying legal and institutional milieu described in this book is quite recent. Since its inception, the activity of planning has been known and continues to be known by other related terminologies including: 'land use planning', 'physical planning', 'urban planning', 'town and country planning', 'regional planning' and even just 'planning'. As we will show shortly, just as societies in general continue to evolve and the prevailing socio-environmental and economic challenges of the day continue to assume different degrees of complexity, so has planning, which seeks to confront these complex challenges evolved in terms of the underlying theories and the nature and scope of the activities associated with it in practice. In general, the nature and scope of planning within any given society, indicative of the terminology used, reflect the priorities of that society, which in turn determine the focus and core functions embraced by the activity. In some instances, the terminologies used also indicate the spatial scale (i.e. whether town, city, regional or national level) at which the activity of planning is undertaken. With this recognition at the background, we will in the sections that follow, review the meanings of some of these terminologies, learning in the process why we have come to use the term spatial planning.

VILLAGE PLANNING BASED ON THE ABOVE TECHNIQUES:



INTERPRETATION:

This is a village planning map of Banchukumari Grampanchayat of Alipurduar-I C-D block. This gram panchayat has a boundary with four other gram panchayat, Vivekananda –II and Alipurduar municipality in the eastern side and Tapshikatha and Parerpar in the western side of this gram panchayat. Four primary schools and two high schools have found in this map. Three Shishu Shiksha kendra, two health sub center situated in this Panchayat. Two Blacktop road, two earthen road, one concrete road has found in this panchayat area.

GEOPDSE04P: B.

Regional Planning and Rural Development
Practical

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Unit 1: Rural Research Method and Methodology

1.1. Pre-field issues on rural research

Contemporary research trends

Evaluation is an essential characteristic of the human condition, and perhaps the single most important and sophisticated cognitive process in the repertoire of human reasoning and logic. Evaluation serves society by providing affirmations of worth, value and improvement to name just a few, and is a process which permeates all areas of human activity, scholarship and production.

This work is split into four volumes:

Volume One: Contains articles featuring contemporary issues and emerging trends in evaluation

Volume Two: Contains articles highlighting recent theoretical, methodological, and empirical developments in quantitative evaluation designs

Volume Three: Contains a summation of articles on recent developments in qualitative and mixed methods evaluation practice

Volume Four: Contains a synthesis of articles on enduring issues of evaluation training and practice

Literature search on research problem stated:

- Di literature review
- Identify research gap
- Identify research problem
- Do the research

Farming research question and hypothesis

- Identify research gap
- Selection of method
- Specific assumption
- Test the assumption
- End result
- Give suggestion

Specific assumption = 1. Null hypothesis

2. Alternative hypothesis

Null hypothesis and Alternative hypotheses

The actual test begins by considering two hypotheses. They are called the null hypothesis and the alternative hypothesis. These hypotheses contain opposing viewpoints.

H_0 : **The null hypothesis:** It is a statement of no difference between sample means or proportions or no difference between a sample mean or proportion and a population mean or proportion. In other words, the difference equals 0.

H_a : **The alternative hypothesis:** It is a claim about the population that is contradictory to H_0 and what we conclude when we reject H_0 .

Since the null and alternative hypotheses are contradictory, you must examine evidence to decide if you have enough evidence to reject the null hypothesis or not. The evidence is in the form of sample data.

After you have determined which hypothesis the sample supports, you make a **decision**. There are two options for a decision. They are “reject H_0 ” if the sample information favors the alternative hypothesis or “do not reject H_0 ” or “decline to reject H_0 ” if the sample information is insufficient to reject the null hypothesis.

Selecting study area and target population

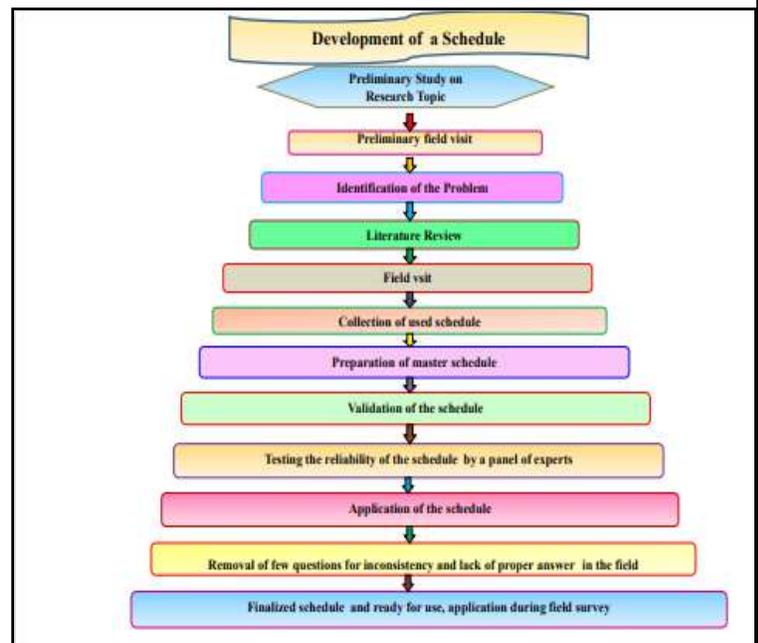
- Identify the problem of a specific study area
- No previous work on that problem
- Select the problem for mitigation
- Identify the victimized people
- Do primary survey
- Mitigate the problem
- Do the research

Collection of data

- Visit several websites
- Visit several govt. offices
- Justify authenticity and validity of the data
- Always update yourself about the availability of the data
- Make research objective flexible enough to match the requirement of the data

Preparing survey scheduled

A schedule is a structure of a set of questions on a given topic which are asked by the interviewer or investigator personally. The order of questions, the language of the questions and the arrangement of parts of the schedule are not changed. However, the investigator can explain the questions if the respondent faces any difficulty. It contains direct questions as well as questions in tabular form.



Schedule includes open-ended questions and close-ended questions. Open-ended questions allow the respondent considerable freedom in answering. However, questions are answered in details. Close-ended questions have to be answered by the respondent by choosing an answer from the set of answers given under a question just by ticking.

Following are the different types of schedules used by social scientists and anthropologists.

Village or community schedule: It is used by census researchers who collect general information on populations, occupations, etc.

Family or Household schedule: It gives full demographic details of households, the status of individuals, data on education, age, family relations, etc.

Opinion or attitude schedule: To schedule the views of the population regarding an issue.

Questionnaire

A questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in by himself. It consists of some questions printed or typed in a definite order. These forms are actually mailed to the respondent who was expected to read and understand the questions and reply to them by writing the relevant answers in the spaces provided. Ideally, speaking respondent must answer to a verbal stimulus and give a written or verbal response. It is totally devoid of any table. Its purpose is to collect information from the respondents who are scattered over a vast area.

Questionnaires include open-ended questions and close-ended questions. Open-ended questions allow the respondent considerable freedom in answering. However, questions are answered in details. Close-ended questions have to be answered by the respondent by choosing an answer from the set of answers given under a question just by ticking.

Following are the different types of Questionnaire used by social scientists and anthropologists.

Structured questionnaire: It includes definite, concrete and pre-obtained questions which were prepared in advance.

Closed-form questionnaire: It is used when categorized data is required.

Pictorial questionnaire: It is used to promote interest in answering after seeing the pictures on a particular theme.

Unstructured questionnaire: Designed to obtain viewpoints, opinions, attitudes and to show relationships and interconnections between data which might escape notice under more mechanical types of interrogations.

A schedule, however, takes more time as compared to a questionnaire. A questionnaire has less data collecting ability than a schedule. A questionnaire can cover a very wide field of data whereas a

schedule is a problem-oriented data collecting method. A questionnaire takes for itself and is self-explanatory, whereas schedule has to be explained by the investigator.

1.2. Issues on field research

Pilot study based in questionnaire

A pilot survey is one of the most effective methods of getting real-time feedback on your product from your target market. Besides from powering data-driven decision-making, they also help you save time, cost and ultimately create a product that everyone loves.

What is a Pilot Survey?

A pilot survey is a mini-survey where the researcher sends out a questionnaire to a smaller sample size compared to the actual target audience. By collecting information from a convenience sample, you can predict the response patterns of participants and make any required changes to your research.

The main objective of a pilot survey is to test the research tools including the questions, survey structure, and distribution channels. If done in the right way, it helps you to discover challenges that can affect the main data collection process.

As an organization conducting market research or trying to gather feedback on a product or service, you can send out your pilot survey to some of the stakeholders in your company including employees. A pilot survey isn't just about collecting relevant information from respondents; it is also about testing your survey functionalities at different touch points

Pilot Survey Questionnaire Examples

In addition to the actual survey questions, you can include some of these questions in your pilot survey to help you get specific and relevant feedback from respondents.

1. How difficult were the survey questions?

Very difficult

Somewhat difficult

Easy

Very Easy

Neither easy nor difficult

This question helps you to know if the survey questions were easily understood by respondents or if they need to be simplified.

Ethnographic field diary

Data are typically recorded through observational field notes, which allow the collection of relatively concrete descriptions of the setting and the activity or whatever is considered suitable and useful. Ethnographers typically then employ other methods, often interviews, and develop further methods over time. For example, Bunce et al. [31], in an ethnographic process evaluation of a technology-based diabetes intervention in health clinics, used diaries, document analysis, interviews, group interviews, and a survey in their data collection. Emerging topics and themes can be followed up using appropriate methods, in order to build concepts, ideas, and theories. Furthermore, because of the exploratory nature of this methodology, an ethnographic study can uncover and follow up novel data in order to build theory.

Longitudinal study and case study research

A longitudinal study is a research conducted over an extended period of time. It is mostly used in medical research and other areas like psychology or sociology. When using this method, a longitudinal survey can pay off with actionable insights when you have the time to engage in a long-term research project. Longitudinal studies often use surveys to collect data that is either qualitative or quantitative. Additionally, in a longitudinal study, a survey creator does not interfere with survey participants. Instead, the survey creator distributes questionnaires over time to observe changes in participants, behaviors, or attitudes. Many medical studies are longitudinal; researchers note and collect data from the same subjects over what can be many years.

Case study research

A case study is an empirical in-depth inquiry about an individual, family, group or organization. It is preferable when 'how' and 'why' questions are asked. The case study is mainly used to explain those causal links in real-life intervention that are too complex for either the survey or experimental strategies. Like other research strategies, its design includes questions or propositions, units of analysis, the logic linking the data to the questions or propositions, and the interpretations of the outcomes. A case study can be reported as a single case or as a compilation of a series of cases. In conclusion, a case study is a simple and excellent way for a care professional to present him or herself to the scientific world.

Ethical Issues in collection of primary data

Data collection is central part of community health improvement efforts. Sometimes, the aim is to learn more about a problem as it is experienced by a specific group of people; other times it is to see if people are better off after participating in an intervention. Most data is collected through surveys, interviews, or observation. It's important to keep in mind the following when we collect data:

- It is good practice to let people know who you are (your name, organization and reason for collecting data when you ask them if they would like to participate).
- You should have permission from participants (people providing the data) and they should be made aware that• their involvement is voluntary. Participants are free to withdraw from any active data collection or intervention program at any point without pressure or fear of retaliation.
- Avoid or minimize anything that will cause physical or emotional harm to participants. Make participants aware• of any potential harms prior to their participation.
- Try to remain neutral and unbiased. Don't let your personal preconceptions or opinions interfere with the data• collection process.
- Collecting data (i.e. through surveys) is often done under the assumption that information provided is confidential and the findings will be anonymous. You should let participants know when you will have to break confidentiality (e.g. in the case of harm to themselves or someone else) and whether results will be anonymous or not.
- When collecting data, try to avoid taking advantage of easy to access groups simply because they are there (this is called "convenience sampling").
- Data should be collected from those that most help us answer our questions. Be respectful of people's time and when possible, compensate them for it. Be sure to protect the data you collect from people.
- Do not leave anything with personal information in a place that can easily be accessed by people who do not need to see the data (e.g. the back seat of your car). If possible, keep the information in a secure or locked location.

- After data are analyzed it is always good to share the results back to the participants. If anything on these guidelines is new to you, please consult with the NJHC's Data Committee. They can help design data collection activities that comply with these guidelines, and set you up to produce meaningful information for your workgroup.

1.3 Field techniques

Participatory rural appraisal

Participatory Rural Appraisal (PRA) recently renamed Participatory Learning for Action (PLA), is a methodological approach that is used to enable farmers to analyse their own situation and to develop a common perspective on natural resource management and agriculture at village level.

PRA is an assessment and learning process that empowers farmers to create the information base they need for participatory planning and action. Outsiders contribute facilitation skills and external information and opinions. Many different tools have been developed for use in PRA. There are four main classes: tools used in group and team dynamics; tools for sampling; options for interviews and dialogue; and options for visualization and preparing diagrams. Most countries have had some experience with PRA and local publications are available. IIED regularly reports on new developments.

PRA - tools and process

Even where it has quite different **objectives** from a RRA, many of the **activities** in a PRA are likely to be very similar. During the initial stages of a PRA, the techniques used by a PRA team to make contact with communities and learn about them are essentially the same as in RRA. A variety of tools can be selected and used in a structured way to learn about the key issues in the community and elicit local opinion and priorities. But the way in which these tools are used in a PRA should then shift - rather than the outside team using the tools so that **they** can get a better understanding of local conditions, the focus of the activity becomes the encouragement of local people to use these tools to carry out their **own** analysis of their livelihoods, conditions and environment.

Generally, PRA carried out in this way is thought of as an initial step in a process of planning in which the community will take a progressively more important role. The process is represented in an idealized.

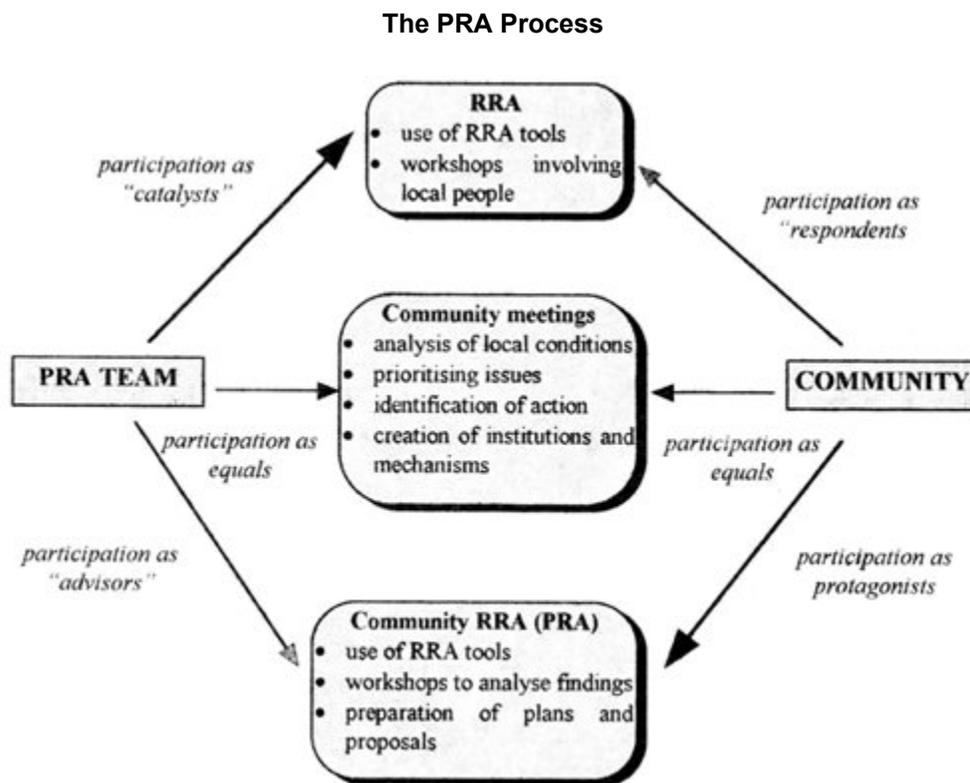
The processes which PRA sets in motion are complex and can have very far reaching implications which are not necessarily seen in **RRA**. In RRA the objectives and focus of the exercise, and therefore the outputs, can be controlled to some extent by those who are carrying it out and kept in line with their interests and concerns.

So, for example, an aquaculture agency can carry out an RRA which focuses on aquaculture issues and keep the activity concentrated on those issues, even if related issues may also be addressed. In RRA the boundaries of the activity can be clearly set.

In **PRA**, these "boundaries" are inevitably less clear because, by definition, they have to be determined **not** by those who initiate the PRA as an activity, but by the communities, target groups or beneficiaries who are the subject of the PRA. It is therefore much more difficult for workers in a development agency to use PRA to achieve objectives which **they** have set, unless those objectives are extremely general, such as "enabling local people to design their own development".

The same goes for the tools which are used in a PRA. In an **RRA**, the RRA team can clearly decide what the principal issues are, how to investigate them and the tools to use. Interviews about water tenure can be kept focused on **that** subject.

This can also be done in the context of a PRA during the initial phase when the PRA team is learning about the community. But once the activity progresses into the identification and analysis of issues **by the community itself**, it becomes far more difficult for outsiders to direct the activity towards particular goals - that would be a contradiction of the term "participatory".



Advantages and disadvantages of PRA

The **advantages** of adopting a more participatory approach to development planning have been well-documented although there has been less discussion of the **disadvantages**. The ways in which these advantages and disadvantages might effect aquaculture planning are more difficult to establish as documentation of cases of PRA use specifically for aquaculture are few and far between. One reason for this is that PRAs are generally not specific to any particular discipline but are, almost by definition, part of an integrated approach which might or might not include aquaculture.

However, here the principal positive and negative features of PRA are listed and how these features might manifest themselves for aquaculture workers is mentioned.

Advantages

• Identification of genuine priorities for target group

PRA allows local people to present their own priorities for development and get them incorporated into development plans. Where aquaculture is identified as a priority during the course of a PRA, planners can be more secure that this responds to a real need among local people, whether that be for increased income, better fish supply or more intensive water use and management. The risks of outside planners "imposing" aquaculture as a solution and then discovering that local people are not really interested or committed to its development can be significantly reduced.

• Devolution of management responsibilities

An important goal of PRA is to encourage self-reliant development with as much of the responsibility for the management and implementation of development activities devolved to local people themselves. This can greatly improve the efficiency of development work and eliminate many of the problems regarding proprietorship of development activities at the community level. Particularly for an activity like aquaculture, trials carried out in communities by projects run by outsiders are frequently plagued by problems of mismanagement and theft. This is usually linked to the fact that the community does not actually feel any responsibility for the activity and regards it as a temporary benefit to be exploited for as much as possible while it is there. An activity generated by a PRA will usually be managed by the community and the benefits will be clear to them.

• Motivation and mobilisation of local development workers

Participation in PRA by local development workers, whether from NGOs, government or other agencies can greatly increase the motivation and level of mobilisation in support of the project or programme of which it is part. Where changes in development approaches are being introduced, such as a shift to a more integrated development planning mechanism, a PRA-type activity which illustrates how these new mechanisms will work on the ground can help to ensure better understanding and commitment by local workers. This is one reason why involvement of people from different administrative and organisational levels can be vital so that commitment is built up right through the chain. Aquaculture workers may not be used to working together with other disciplines. Involvement in a PRA can help them understand the priorities of workers from other disciplines as well as those of members of the community.

• Forming better linkages between communities and development institutions

PRA can assist in forming better links between communities and the agencies and institutions concerned with rural development. This can benefit aquaculture workers by helping them with the monitoring of aquaculture development and environmental issues related to aquaculture. An example might be in a mangrove area subject to environmental regulation but where monitoring is difficult. A PRA which encourages a better understanding of the environmental issues at stake in local communities and develops activities which enable them to benefit from better management could also lead to better monitoring of mangrove exploitation by the communities themselves. PRAs involve intensive interaction between communities and outsiders which can have lasting effects in breaking down the barriers of reticence and suspicion which often characterise these relationships.

• Use of local resources

Where local people have had more say in the design of projects they are also more likely to design activities which make full use of existing resources. In the case of aquaculture this might mean the use of local instead of exotic fish species, the improvement of existing water bodies rather than the creation of new ones or the design of activities which fit into current livelihood strategies rather than creating new strategies.

• Mobilisation of community resources

Greater commitment from the community can also mean greater mobilisation of community resources for development and less reliance on outside inputs. This can take the form of labour inputs, savings or time devoted to management functions.

- ***More sustainable development activities***

this combination of effects will generally lead to more sustainable development activities which are less reliant on support from outside agencies and are technically, environmentally and socially appropriate to local conditions.

These benefits from participation can only be realised where the full implications of participation for the development agencies which are encouraging it have been taken into account and accommodated and the institutions involved are willing to support the sort of long-term changes in social, political and institutional frameworks which proper participation, and PRA, can set in motion. Where this is not the case, many of the following **disadvantages** can come into play.

Disadvantages

- ***Raising expectations which cannot be realised***

One of the most immediate and frequently encountered risks in PRA is that it raises a complex set of expectations in communities which frequently cannot be realised given the institutional or political context of the area. This can be due to the political situation, the local power and social structure or simply to bureaucratic inertia in institutions which are supposed to be supporting development. In some cases the intended aim of the PRA may be to deliberately raise expectations "at the grassroots" so as to put pressure on the institutional and political structures above to change. However, not all development agencies are in a position to support such activities and there is a risk that agencies which are **not** properly equipped to respond to PRA-type planning may use the approach inappropriately. Aquaculture agencies might well be encouraged to use "PRA", by donors for example, only to find that they are encouraging local people to participate in planning and decision-making in a society or political framework which positively **discourages** grassroots participation.

- ***Proposal of development plans which participating agencies cannot respond to***

Linked to this first point is the risk that the development priorities which communities identify during the course of a PRA may be ones which participating agencies simply cannot respond to adequately in the technical sense, thus again raising expectations only to disappoint them. This again comes back to the problem that the "playing field" in PRA has practically no boundaries and this can make the approach inappropriate for sectorally oriented agencies. This would include many aquaculture departments organised along traditional lines.

- ***Risk of "capture" of activities by local interests***

By devolving decision-making responsibility to communities and leaving the identification and planning of activities to them, there is also a real risk that particular elements in communities - the more educated, the wealthiest, those with authority - may find it easier to "capture" the activity and monopolise its benefits. The relative lack of outside involvement in a participatory planning process can make this much easier. Poor people in the community might support "community" decisions which will not benefit them at all because they are supported by their wealthier and more influential patrons. Aquaculture can be particularly prone to this as it is often proposed as a means of making better use of "common" land or water areas. The act of "developing" those areas may bring them into the sphere of influence of local authorities and deprive poorer people of access.

- ***Failure to take account of stratification in communities***

The fact that PRA is often carried out with the community as a whole can mean that stratification within the community, whether by wealth, social status, gender or ethnic group, can often be obscured and ignored. This may happen even though preliminary research in the community has clearly identified that there are strata and different sets of interests in the community. In PRA, decisions about how to accommodate the conflicting interests of different groups have to be left up to the community itself and, while one of the roles of outsiders involved in PRA is to encourage negotiation and arbitration between different interest groups, if the "community" decides that they want to resolve problems by ignoring the interests of the poor and weak, it may be difficult for "outsiders" to do much about it, especially if they are committed to devolving responsibility to the community.

The case study in Box 13 is not specifically related to PRA and **aquaculture** but helps to highlight some of these potential problems in the use of PRA. In this particular example, many of the problems encountered were related to the specific techniques used in PRA, such as public meetings and group activities. While these are intended to help in building consensus in the community and encourage “participation” by as broad a group as possible, this example shows how different communities can react very differently to this type of approach depending on their cultural background and their past experience of outside intervention.

Situations regarded by PRA teams as “informal” may be considered, by contrast, extremely formal by villagers. What can and cannot be said in such a formal setting is generally strongly conditioned by cultural and social factors. Women in many cultures may have great difficulty in speaking or even just in being present in such formal situations. The form of such social and cultural conditioning is unpredictable unless good ground work has been done on the communities involved.

For workers in aquaculture, these types of problem can be very real. Outsiders coming to the community to talk about aquaculture may be seen to represent “development” and this could induce people to support the idea of aquaculture development in public when in fact, in private, they would regard it as a very low priority.

Focus Group Discussion

What is Focus Group Discussion (FGD)? A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest. The group’s composition and the group discussion should be carefully planned to create a non-intimidating environment, so that participants feel free to talk openly and give honest opinions. Since participants are actively encouraged to not only express their own opinions, but also respond to other members and questions posed by the leader, focus groups offer a depth, nuance, and variety to the discussion that would not be available through surveys. Additionally, as FGDs are structured and directed, but also expressive, they can yield a lot of information in a relatively short time. Therefore, FGDs are a good way to gather in-depth information about a community’s thoughts and opinions on a topic. The course of the discussion is usually planned in advance and most moderators rely on an outline, or guide, to ensure that all topics of interest are covered.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience.
- Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly. Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

Dos and Don'ts

Dos

- Be the naive listener or the naive observer.
- Wear clothes that fit in with what they wear.
- Act like the participants and you are equal. Look innocent, as if you didn't know things, even if you do. Have all your questions planned.
- Your job is to simply facilitate the focus group happening. It should almost run itself once you have it on track.
- Start with open questions. The first question should be general to get people warmed up, say about participants' views about the topic.
- If you hear of something you haven't heard of before, ask• the person to tell you more about it. If someone gives a general 'motherhood' answer, ask them to give you an example.
- If someone shares an opinion, check with others in the group whether they share the view. At the beginning, explain you will be confidential, that you invite them to be confidential and what will happen to the information they give you. If there will be a report, explain who it will go to and how it will be used.
- Go around the room and get each person to answer your first question, to draw everyone in. Keep praising and thanking people for their contribution. Make them feel their contribution is welcome and worthwhile. Be sympathetic about the issues they raise, even if you think some are using the focus group as a bit of a whinge session.
- Regularly ask questions of specific people, to draw people in. Feel free to change the order of the questions if someone• brings up something that relates to a later question.

Don'ts

- Do not ask leading questions (ones that might suggest you are looking for a particular answer).
- Do not ask 'yes or no' questions, as this does not open up discussion, though if you inadvertently do, you can follow up with 'why'? Do not ask double-barrelled questions.
- People cannot answer two questions at once.
- Do not tell people they are wrong. Do not correct them.
- Do not express any point of view.
- Generally, try not to shut people down. Welcome their contribution whatever it is. Never say, "We'll be talking about that later, not now."

1.4. Post field techniques

Methods of report writing

An objective of organizing a research paper is to allow people to read your work selectively. For most studies, a proper research report includes the following sections, submitted in the order listed, each section

to start on a new page. Some journals deviate from the format, such as by combining results and discussion, or combining everything but the title, abstract, and literature as is done in the journal *Science*. Your reports will adhere to the standard format.

- Title page,
- Abstract,
- Introduction,
- Materials and Methods,
- Results,
- Discussion,
- Literature Cited,
- Examples

Transcription from ethnographic field notes

Ethnographers are committed to going out and getting close to the activities and everyday experiences of other people. "Getting close" minimally requires physical and social proximity to the daily rounds of people's lives and activities; the field researcher must be able to take up positions in the midst of others' lives in order to observe and understand them. But given our emphasis on interpretation, getting close has another, far more significant, component: The ethnographer seeks a deeper immersion in others' worlds in order to grasp what they experience as meaningful and important. With immersion, the field researcher sees from the inside how people lead their lives, how they carry out their daily rounds of activities, what they find meaningful, and how they do so. In this way, immersion gives the fieldworker access to the fluidity of others' lives and enhances his sensitivity to interaction and process. Furthermore, immersion enables the fieldworker to directly and forcibly experience for herself both the ordinary routines and conditions under which people conduct their lives and the constraints and pressures to which such living is subject. Goffman (1989:125), in particular, insists that field research involves "subjecting yourself, your own body and your own personality, and your own social situation, to the set of contingencies that play upon a set of individuals, so that you can physically and ecologically penetrate their circle of response to their social situation, or their work situation, or their ethnic situation." Immersion in ethnographic research, then, involves both being with other people to see how they respond to events as they happen and experiencing for oneself these events and the circumstances that give rise to them. Clearly, ethnographic immersion precludes conducting field research as a detached, passive observer; the field researcher can only get close to the lives of those studied by actively participating in their day-to-day affairs. Such participation, moreover, inevitably entails some degree of resocialization. Sharing everyday life with a group of people, the field researcher comes "to enter into the matrix of meanings of the researched, to participate in their system of organized activities, and to feel subject to their code of moral regulation" (Wax 1980:272-73). In participating as fully and humanly as possible in another way of life, the ethnographer learns what is required to become a member of that world and to experience events and meanings in ways that approximate members' experiences! Indeed, some ethnographers seek to do field research by doing and becoming—to the extent possible—whatever it is they are interested in learning about. Ethnographers, for example, have become skilled at activities they are seeking to understand (Diamond 1992; Lynch 1985; Wacquant 2004) or, in good faith, have joined churches or religious groups (Jules-Rosette 1975; Rochford 1985) on the grounds that by becoming members, they gain fuller insight and understanding into these groups and their activities. Or, villagers might assign an ethnographer a role, such as sister or mother, in an extended family, which obligates her to participate and resocialize herself to meet local expectations. In learning about others through active participation in their lives and activities, the fieldworker cannot and should not attempt to be a fly on the wall. No field researcher can be a completely neutral, detached observer who is outside and independent of the observed phenomena (Emerson and Pollner 2001). Rather, as the ethnographer engages in the lives and concerns of those studied, his perspective "is intertwined with the phenomenon which does not have objective characteristics independent of the observer's perspective and methods" (Mishler 1979:10). But, the ethnographer cannot take in everything; rather, he will, in conjunction with those in the setting, develop certain perspectives by engaging in some activities and relationships rather than others. Moreover, often relationships with those under study follow political fault lines in the setting, exposing the ethnographer

selectively to varying priorities and points of view. As a result, the task of the ethnographer is not to determine "the truth" but to reveal the multiple truths apparent in others' lives. • Furthermore, the ethnographer's presence in a setting inevitably has implications and consequences for what is taking place, since the fieldworker must necessarily interact with and, hence, have some impact on those studied.' But "consequential presence," often linked to reactive effects (that is, the effects of the ethnographer's participation on how members may talk and behave), should not be seen as "contaminating" what is observed and learned. Rather, these effects might provide the very source of that learning and observation (Clarke 1975:99). Relationships between the field researcher and people in the setting do not so much disrupt or alter ongoing patterns of social interaction as they reveal the terms and bases on which people form social ties in the first place. For example, in a village where social relations depend heavily on kinship ties, people might adopt a fieldworker into a family and assign her a kinship term that then designates her rights and responsibilities toward others. Hence, rather than detracting from what the fieldworker can learn, firsthand relations with those studied might provide clues to understanding the more subtle, implicit underlying assumptions that are often not readily accessible through observation or interview methods alone. • Consequently, rather than viewing reactivity as a defect to be carefully controlled or eliminated, the ethnographer needs to become sensitive to, and perceptive about, how she is seen and treated by others. To appreciate the unavoidable consequences of one's own presence strips any special merit from the highly detached, "unobtrusive," and marTHE COMPLEXITIES OF DESCRIPTION 5 ginal observer roles that have long held sway as the implicit ideal in field research. Many contemporary ethnographers assume highly participatory roles (Adler and Adler 1987) in which the researcher actually performs the activities that are central to the lives of those studied. In this view, assuming real responsibility for actually carrying out core functions and tasks, as in service learning internships, provides special opportunities to get close to, participate in, and experience life in previously unknown settings. The intern with real work responsibilities or the researcher participating in village life actively engages in local activities and is socialized to, and acquires empathy for, local ways of acting and feeling. Close, continuing participation in the lives of others encourages appreciation of social life as constituted by ongoing, fluid processes of interaction and interpretation. Through participation, the field researcher sees first hand and up close how people grapple with uncertainty and ambiguity, how meanings emerge through talk and collective action, how understandings and interpretations change over time, and how these changes shape subsequent actions. In all these ways, the fieldworker's closeness to others' daily lives and activities heightens sensitivity to social life as process. Yet, even with intensive participation, the ethnographer never becomes a member in the same sense that those who are "naturally" in the setting are members. The fieldworker plans on leaving the setting after a relatively brief stay, and his experience of local life is colored by this transience. As a result, "the participation that the fieldworker gives is neither as committed nor as constrained as the native's" (Karp and Kendall 1982:257). Furthermore, the fieldworker orients to many local events, not as "real life" but, rather, as objects of possible research interest and as events that he may choose to write down and preserve in fieldnotes. In these ways, research and writing commitments qualify ethnographic immersion, making the field researcher at least something of an outsider and, at an extreme, a cultural alien.

Audio-video recordings

Quickly and easily view, record, code, and manage video events with VALT. VALT is a complete hardware and software solution that lets you capture high-quality audio and HD video using IP cameras, without the need for extensive IT support. Research organizations are deploying VALT to create a powerful, agile, and customizable video recording system for medical/behavioral research facilities, focus groups, product testing, user experience development, and usability test.

The VALT solution is an incredibly simple but powerful tool that can be learned in minutes. Basic observation and recording tasks are often picked up intuitively without the need for any extensive training or technical support. VALT has excellent reporting capabilities, allowing researchers to easily code their recordings, making it ideal for research groups to share data. Our interface minimizes complexity and points of failure so that your recording system is always there when you need it for your research recording and streaming applications.

Participant Observation

The participant observation method, also known as ethnographic research, is when a sociologist actually becomes a part of the group they are studying in order to collect data and understand a social phenomenon or problem. During participant observation, the researcher works to play two separate roles at the same time: subjective participant and objective observer. Sometimes, though not always, the group is aware that the sociologist is studying them.

The goal of participant observation is to gain a deep understanding and familiarity with a certain group of individuals, their values, beliefs, and way of life. Often the group in focus is a subculture of a greater society, like a religious, occupational, or particular community group. To conduct participant observation, the researcher often lives within the group, becomes a part of it, and lives as a group member for an extended period of time, allowing them access to the intimate details and goings-on of the group and their community.

This research method was pioneered by anthropologists Bronislaw Malinowski and Franz Boas but was adopted as a primary research method by many sociologists affiliated with the Chicago School of Sociology in the early twentieth century. Today, participant observation, or ethnography, is a primary research method practiced by qualitative sociologists around the world.

Subjective Versus Objective Participation

Participant observation requires the researcher to be a subjective participant in the sense that they use knowledge gained through personal involvement with the research subjects to interact with and gain further access to the group. This component supplies a dimension of information that is lacking in survey data. Participant observation research also requires the researcher to aim to be an objective observer and record everything that he or she has seen, not letting feelings and emotions influence their observations and findings.

Yet, most researchers recognize that true objectivity is an ideal, not an actuality, given that the way in which we see the world and people in it is always shaped by our previous experiences and our positionality in the social structure relative to others. As such, a good participant observer will also maintain a critical self-reflexivity that allows her to recognize the way she herself might influence the field of research and the data she collects.

Strengths and Weaknesses

The strengths of participant observation include the depth of knowledge that it allows the researcher to obtain and the perspective of knowledge of social problems and phenomena generated from the level of the everyday lives of those experiencing them. Many consider this an egalitarian research method because it centers the experiences, perspectives, and knowledge of those studied. This type of research has been the source of some of the most striking and valuable studies in sociology.

Some drawbacks or weaknesses of this method are that it is very time-consuming, with researchers spending months or years living in the place of study. Because of this, participant observation can yield a vast amount of data that might be overwhelming to comb through and analyze. And, researchers must be careful to remain somewhat detached as observers, especially as time passes and they become an accepted part of the group, adopting its habits, ways of life, and perspectives. Questions about objectivity and ethics were raised about sociologist Alice Goffman's research methods because some interpreted passages from her book "On the Run" as an admission of involvement in a murder conspiracy.

Students wishing to conduct participant observation research should consult two excellent books on the subject: "Writing Ethnographic Fieldnotes" by Emerson et al., and "Analyzing Social Settings", by Lofland and Lofland.

Unit 3 : Techniques and formulation of Rural Planning through Data Analysis

3.1. Application of qualitative research techniques

Stakeholder Analysis and identification of problems and priorities

What is stakeholder analysis?

Stakeholder analysis is an extremely useful technique for identifying, understanding, and prioritizing all stakeholders who may wield influence or power over a business or project. Among other things, analyzing stakeholders will reveal who they are, what their needs and expectations may be, and what issues matter to them (and to what degree). Just as importantly, this exercise will tell you their true level of interest and/or influence over your project. A thorough analysis will ensure that all affected parties are duly considered. Having access to this knowledge can greatly improve the outcomes of conflict resolution. It can also make your day-to-day stakeholder engagement efforts much more targeted.

Why analyze stakeholders

Not all stakeholders deserve the same amount of attention. This is why conducting stakeholder analysis is so beneficial. It allows you to properly identify all stakeholders and to categorize them in order of importance as it pertains to your efforts to secure social acceptance and ensure successful project delivery. More specifically, this analysis will tell you the interests of all stakeholders who may impact or be impacted by the project, the attributes of project advocates and opponents, as well as the interrelationships and interfaces that exist between them. In other words, it will tell you how these different groups interact and how this interaction may be serving or jeopardizing your interests. During your stakeholder analysis, you'll also uncover any potential risks, issues or misunderstanding that could disrupt the project. This information is vital for knowing what type of communication and messaging will best help to minimize perceived negative impacts and amplify positive impacts.

Stakeholder analysis will identify who exactly you should be engaging, informing and/or encouraging participating during the project's execution phase – and to what extent.

This valuable information should serve as the foundation for your stakeholder management strategy and messaging.

When performed on an ongoing basis, stakeholder analysis will also tell you how your key stakeholder groups are changing over time – in terms of who they are, how their needs or expectations may be evolving and how your relationship with them has improved – or deteriorated. This article explores the different types of stakeholder analysis, what elements they have in common and what the benefits of conducting ongoing stakeholder analysis are.

How to identify stakeholders?

Stakeholders can be identified in a number of ways:

1. **Team brainstorming:** The idea here is to come up with the longest possible list of potential. Not all suggestions will be retained but reserve judgment for the end. It's better to weed out than to overlook.
2. **Team members' experience:** Chances are your team has built up valuable knowledge over time, so be sure to tap into it.
3. **Historical data:** Your organization may have accumulated piles of data from previous projects. Using this data to inform your stakeholder analysis simply makes sense as it promotes efficiency and building on experience.
4. **Comparable:** Sometimes you'll be operating in a new location or on a different type of project. Whenever possible, look for similar projects and identify stakeholders who may have played a key role. Chances are the same types of stakeholders will impact (or be impacted by) your current project.

The more approaches you use, the less likely you are to overlook key stakeholders.

When and how to analyze stakeholders?

Knowing who your stakeholders are is vital. Understanding their motivations and concerns is equally so. This is where stakeholder analysis comes in. It's important to analyze stakeholders in the early stages of the project. This will allow you to proactively develop a stakeholder engagement strategy, which generally produces better outcomes. There are a number of models that can be used to analyze stakeholders, each with their own strengths and weaknesses. The most appropriate model will probably depend on the nature of your project and available resources.

A stakeholder management team may also consider using a combination of models to gain a more thorough understanding of their key stakeholder groups and their potential impact on the project.

SWOT analysis of a rural development scheme or any sector

What Is SWOT Analysis?

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription

How to Do a SWOT Analysis

SWOT analysis is a technique for assessing the performance, competition, risk, and potential of a business, as well as part of a business such as a product line or division, an industry, or other entity.

Using internal and external data, the technique can guide businesses toward strategies more likely to be successful, and away from those in which they have been, or are likely to be, less successful. Independent SWOT analysts, investors, or competitors can also guide them on whether a company, product line, or industry might be strong or weak and why.

Strengths

Strengths describe what an organization excels at and what separates it from the competition: a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favorable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and market share.

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.

SWOT Table

Strengths

1. What is our competitive advantage?
2. What resources do we have?
3. What products are performing well?

Threats

1. What new regulations threaten operations?
2. What do our competitors do well?
3. What consumer trends threaten business?

Weaknesses

1. Where can we improve?
2. What products are underperforming?
3. Where are we lacking resources?

Opportunities

1. What technology can we use to improve operations?
2. Can we expand our core operations?
3. What new market segments can we explore?

3.2. Application of statistical techniques in Demographic Data Analysis

POPULATION COMPOSITION

Introduction :

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

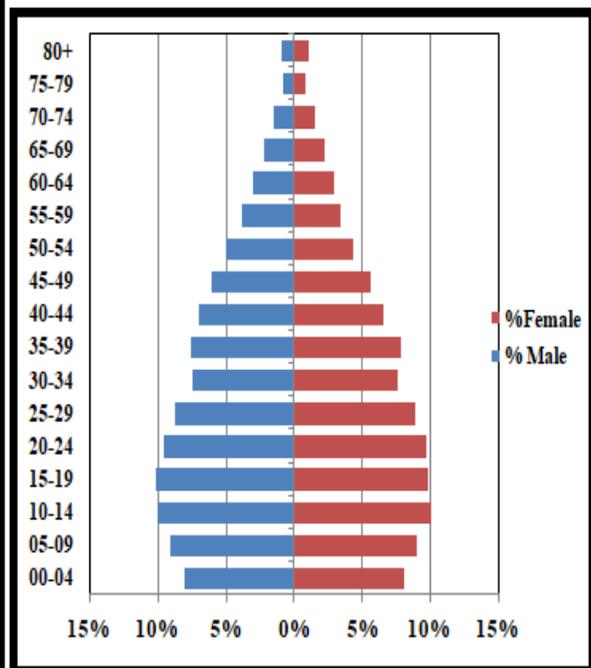
Age structure: The age structure of a population is an important factor in population dynamics. **Age structure** is the proportion of a population in different age classes. Models that incorporate age structure allow better prediction of population growth, plus the ability to associate this growth with the level of economic development in a region. Countries with rapid growth have a pyramidal shape in their age structure diagrams, showing a preponderance of younger individuals, many of whom are of reproductive age. This pattern is most often observed in underdeveloped countries where individuals do not live to old age because of less-than-optimal living conditions, and there is a high birth rate. Age structures of areas with slow growth, including developed countries such as the United States, still have a pyramidal structure, but with many fewer young and reproductive-aged individuals and a greater proportion of older individuals. Other developed countries, such as Italy, have zero population growth. The age structure of these populations is more conical, with an even greater percentage of middle-aged and older individuals.

Sex Ratio: The sex ratio is the ratio males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males.

The Population Pyramids: Both key variables of age and sex combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

POPULATION COMPOSITION AGE – SEX PYRAMID

Age Group	Male	Female	Total	%Male	%Female
00-04	3743862	3589281	7333143	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%
65-69	991280	991713	1982993	-2%	2%
70-74	686881	703726	1390607	-1%	2%
75-79	360216	379551	739767	-1%	1%
80+	406536	477025	445803	-1%	1%
Total	46745275	44418389	90725906	-100%	100%



DEPENDENCY RATIO

Introduction: The dependency ratio is a measure of the number of dependents aged zero to 14 and over the age of 65, compared with the total population aged 15 to 64. This demographic indicator gives insight into the number of people of non-working age, compared with the number of those of working age. It is also used to understand the relative economic burden of the workforce and has ramifications for taxation. The dependency ratio is also referred to as the total or youth dependency ratio.

Formula of Dependency Ratio : In published informational statistics , the dependent part usually includes those under the age of 15 and over the age of 64 . The productive part makes up the population in between , ages 15 – 64 . It is normally expressed as a percentage.

Dependency ratio =

(Number of people aged 0 to 14) + (number of people aged 65 and over)

_____ *100

Number of people aged 15 to 64

As the ratio increases there may be increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent . The results in direct impacts on financial expenditures on things like social security , as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and aged dependency ratio.

Child dependency ratio =

Number of people aged 0 to 14

_____ *100

Number of people aged 15 to 64

Aged dependency ratio =

Number of people aged 65 and over

_____ *100

Number of people aged 15 to 64

EXAMPLES:

For example, assume that the mythical country of Investopedialand has a population of 1,000 people, and there are 250 children under the age of 15, 500 people between the ages of 15 and 64, and 250 people age 65 and older. The youth dependency ratio is 50%, or 250/500.

LIMITATIONS: The dependency ratio only considers age when determining whether a person is economically active. Other factors may determine if a person is economically active aside from age including status as a student, illness or disability, stay-at-home parents, early retirement, and long-term unemployed. Additionally, some people choose to continue working beyond age 64.

DEPENDENCY RATIO

Age Group	Male	Female	Total		
00-04	37,43,862	35,89,281	7333143		
05-09	42,16,763	40,31,046	8247809	24737475	
10-14	46,77,506	44,79,017	9156523		
15-19	47,02,325	43,55,706	9058031	40.26986	
20-24	44,22,630	43,35,692	8758322		
25-29	40,44,904	39,53,005	7997909		
30-34	34,64,659	33,76,931	6841590		
35-39	35,23,361	34,89,285	7012646	61429261	47.69168
40-44	32,19,604	29,33,456	6153060		
45-49	28,14,212	25,21,507	5335719		
50-54	23,17,232	19,40,648	4257880	47.69168	
55-59	17,46,903	15,21,747	3268650		
60-64	14,06,401	13,39,053	2745454		
65-69	9,91,280	9,91,713	1982993		
70-74	6,86,881	7,03,726	1390607	7.421821	
75-79	3,60,216	3,79,551	739767	4559170	
80+	4,06,536	4,77,025	445803		
Total	#####	1,14,18,389	90725906		

Migration

Migration

Migration consists of all the relatively permanent changes of residence into, out of, or within a given political division or administrative area. Typically, internal migration involves the crossing of one or more administrative divisions—such as states, counties, or provinces, but it always occurs within the boundaries of a given country. Conversely, the crossing of an international boundary with the intention of changing residence is what defines international migration. Information on place of birth, duration of residence, place of previous residence, or place of residence at a specified date in the past can be used in conjunction with place of usual residence to determine the migration status of a respondent.

Internal Migration

The United Nations Statistics Division (2015) recommends that countries planning to produce internal migration statistics from census data ask place of usual residence in addition to place where present at the time of census if the latter is the only question they ask in their censuses. In most instances, the usual residence of respondents and their place of residence on census day will be the same. Furthermore, the concept of place of usual residence will most likely be synonymous with the concept of de jure residence,² while the place where present at the time of census would be the same as the de facto residence. In practice, place where present at the time of census is often not asked in census questionnaires and instead extracted from georeferenced address registries or via GPS technology.

International Migration

International migration is the movement across national borders. It can be measured by tracking migration in/ outflows and immigrant stocks. To accurately measure migration, each country should know how many migrants and from where they come (collectively referred to as “immigrants”), and also how many and to what countries people of a country are moving (collectively referred to as “emigrants”)—in addition to their characteristics. It is recommended that census data be used for the measurement of immigrant stocks only. The internationally recognized standards for the collection of international migration data will be explained in this section.

Usual Residence The United Nations Statistics Division (2015) defines usual residence for census purposes as the place at which a person lives at the time of the census and has been there for “some time” or intends to stay there for “some time.” To reduce ambiguity, it is recommended that countries apply a threshold of 12 months when considering place of usual residence according to one of the following two criteria: (a) The place at which the person has lived continuously for most of the last 12 months (that is, for at least 6 months and 1 day), not including temporary absences for holidays or work assignments, or intends to live for at least 6 months. (b) The place at which the person has lived continuously for at least the last 12 months, not including temporary absences for holidays or work assignments, or intends to live for at least 12 months.

Formula of Net Migration Rate

The formula for net migration rate is simple:

$$N = 1000 \times (I - E) / P$$

N = net migration rate

E = number of people emigrating out of the country

I = number of people immigrating into the country

P = the estimated mid-year population

Net Migration Rate Example

Jorge is looking up the data necessary to calculate the net migration rate for his country. At the beginning of 2014, the population was 98 million people. During that same year, 3 million people immigrated into to the country to live, 1 million people emigrated out of the country, 6 million babies were born, and 4 million people died. His current task is to figure out what the net migration rate was for his country in 2014.

The trickiest part of this is to figure out the mid-year population. The 2014 population starts at 98 million and ends at 102 million because $98 + 3 - 1 + 6 - 4 = 102$. That would make the mid-year population estimate 100 million, because 100 is halfway between 98 and 102.

$$N = 1000 \times (I - E) / P$$

Working in millions, this becomes:

$$N = 1000 \times (3 - 1) / (100) = 2000 / 100 = 20$$

OCCUPATIONAL STRUCTURE

Introduction:

The occupational structure of a nation refers to the percentage of its workforce employed in various economic ventures. To put it in other words, articulating the number of the total working population employed in agriculture and associated activities and the number of them involved in the manufacturing and service sectors can be identified from the occupational structure of the nation.

Types of occupational structure:

An occupation of a person is defined as the principal work or business which he or she carries out on a daily basis to earn their primary earning. An occupation or a job provides for a person's subsistence meaning it helps him to earn whatever is necessary to cover all the basic amenities of his life.

Occupation in any country can be broadly divided into three major categories. These are the building blocks of occupational structure meaning these different professions can also roughly indicate how expansive the occupational structure of a country is.

1. Primary occupations of any country include agriculture, construction and animal husbandry.
2. The secondary set of occupations includes the people who work in manufacturing and servicing industries.
3. Tertiary branch of occupations encompasses the part of the population working in communications, transport, administration and other remaining services.

Features of occupational structure in India:

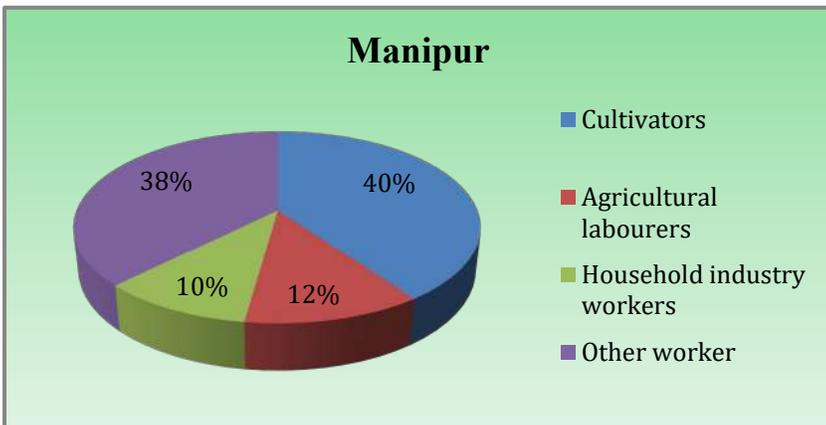
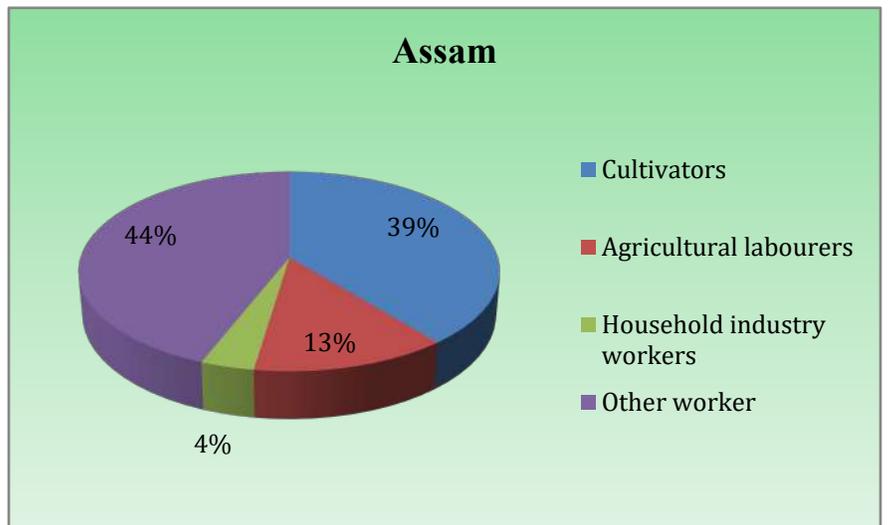
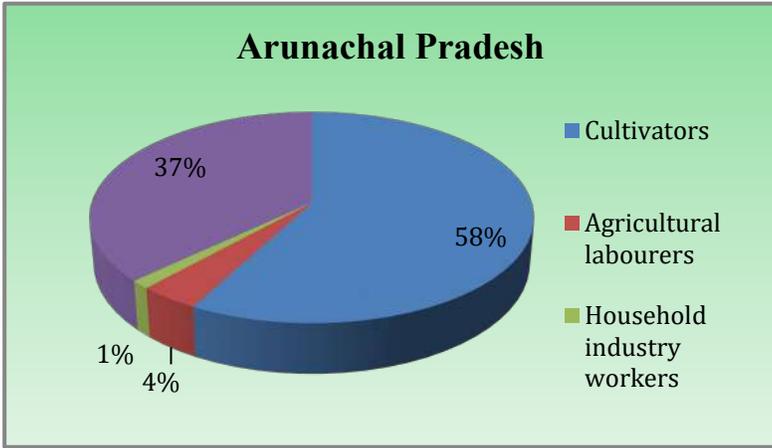
1. Dominance of Agricultural Sector

- a. The main occupation of Indian people was agriculture, which employed around 70-75 per cent of the population.
- b. Due to a considerable fraction of the population already employed in agriculture, other industries did not see a boom in revenue and this was one of the reasons why the Indian economy never rose to its heights during the pre-Independence era.
- c. There was no balance in the occupational structure. The primary occupations attracted more people, and so, the secondary and tertiary occupations never saw themselves contributing much to the national economy.

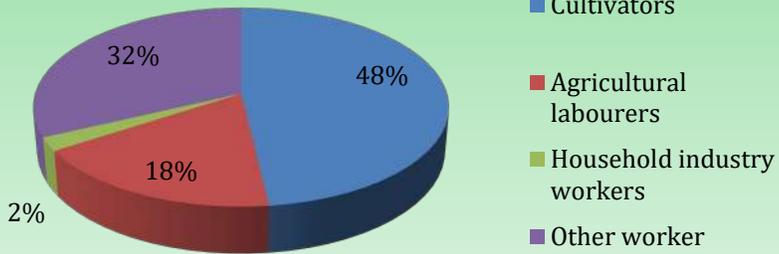
Growing Regional Dissimilarities

- a. States like West Bengal, Karnataka, Tamil Nadu and Maharashtra saw a significant number of people, previously working in the agricultural sector, moving away from it. They started working in other secondary and tertiary occupations, which then started to balance the unbalanced occupational structure of the country.
 - i. At the same time, states like Punjab, Orissa and Rajasthan shifted their focus hugely to agriculture and have continued to do it even now.
- b. This whole process helped the Indian economy to balance itself, with all sectors contributing equally to the economy at present.

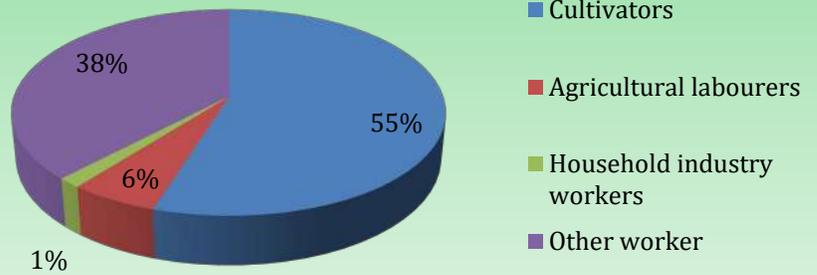
PIE DIAGRAM SHOWING DISTRIBUTION OF WORKERS BY CATEGORY OF WPRKERS



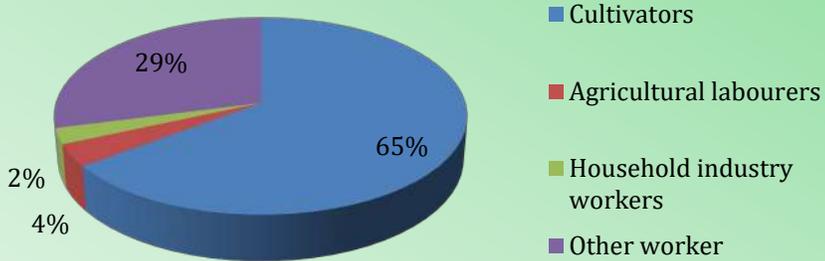
Meghalaya



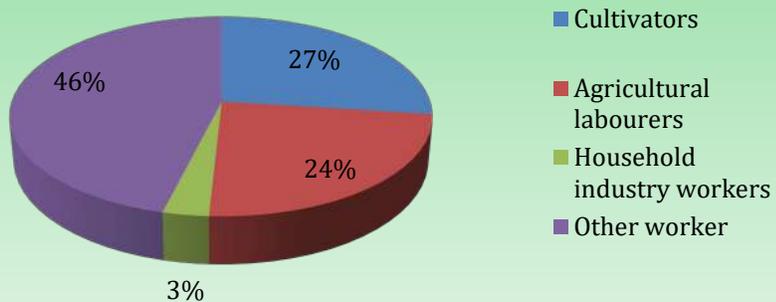
Mizoram



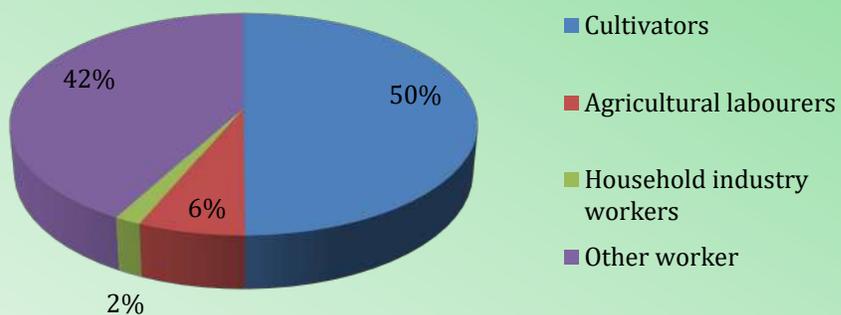
Nagaland



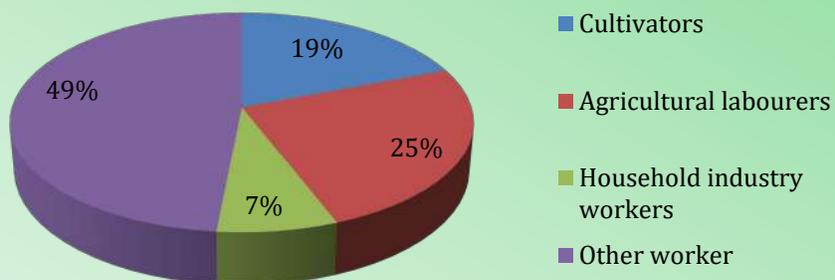
Tripura



Sikkim



West Bengal



3.3. Application of GIS and RS

Preparation of land use map

Land management and land planning requires a knowledge of the current state of the landscape. Understanding current land cover and how it is being used, along with an accurate means of monitoring change over time, is vital to any person responsible for land management. Measuring current conditions and how they are changing can be easily achieved through land cover mapping, a process that quantifies current land resources into a series of thematic categories, such as forest, water, and paved surfaces. By using remotely sensed imagery and semi-automated classification methods, Sanborn provides cost-effective and accurate means to derive land resource information and maintain its currency into the future.

Why do we need LULC Maps?

The growth of a society totally depends on its social and economical development. This is the basic reason why socio-economic surveys are carried out. This type of survey includes both spatial and non-spatial datasets. LULC maps play a significant and prime role in planning, management and monitoring programmers at local, regional and national levels. This type of information, on one hand, provides a better understanding of land utilization aspects and on the other hand, it plays an important role in the formation of policies and programmed required for development planning. For ensuring sustainable development, it is necessary to monitor the on going process on land use/land cover pattern over a period of time. In order to achieve sustainable urban development and to check the haphazard development of towns and cities, it is necessary that authorities associated with the urban development generate such planning models so that every bit of available land can be used in most rational and optimal way. This requires the present and past land use/land cover information of the area. LULC maps also help us to study the changes that are happening in our ecosystem and environment. If we have inch by inch information about Land Use/Land Cover of the study unit we can make policies and launch programmers to save our environment.

ULC classification

LULC classification is one of the most widely used applications in remote sensing. The most commonly used approaches include:

Unsupervised classification (*calculated by software*)

This type of classification is based on the software analysis of an image without the user provided sample classes. This involves grouping of pixels with common characteristics. The computer uses techniques to determine which pixels are related and groups them into classes. The user can specify which algorithm the software will use and the desired number of output classes but otherwise does not aid in the classification process. However, the user must have knowledge of the area being classified (such as wetlands, developed areas, coniferous forests, etc.).

Supervised classification (*human guided*)

This is based on the idea that a user can select sample pixels in an image that are representative of specific classes and then direct the image processing software to use these training sites as references for the classification of all other pixels in the image. Training sites (also known as testing sets or input classes) are selected based on the knowledge of the user. The user also sets the bounds for how similar other pixels must be to group them together. These bounds are often set based on the spectral characteristics of the training area, plus or minus a certain increment (often based on "brightness" or strength of reflection in specific spectral bands). The user also designates the number of classes that the image is classified into.

Image segmentation

Image segmentation is the partition and pick-up of the homogeneous regions of the image. In the results of segmentation, the consistency of gray the smoothing of boundary and the connectivity are fulfilled. The classical method of segmentation is the spatial cleaning based on the measurement space. Image segmentation is a crucial processing procedure for the classifications and feature extraction of high-resolution remote sensing image.

Main image segmentation methods are:

Threshold based

Threshold segmentation is the simplest method of image segmentation and also one of the most common parallel segmentation methods. It is a common segmentation algorithm which directly divides the image gray scale information processing based on the gray value of different targets.

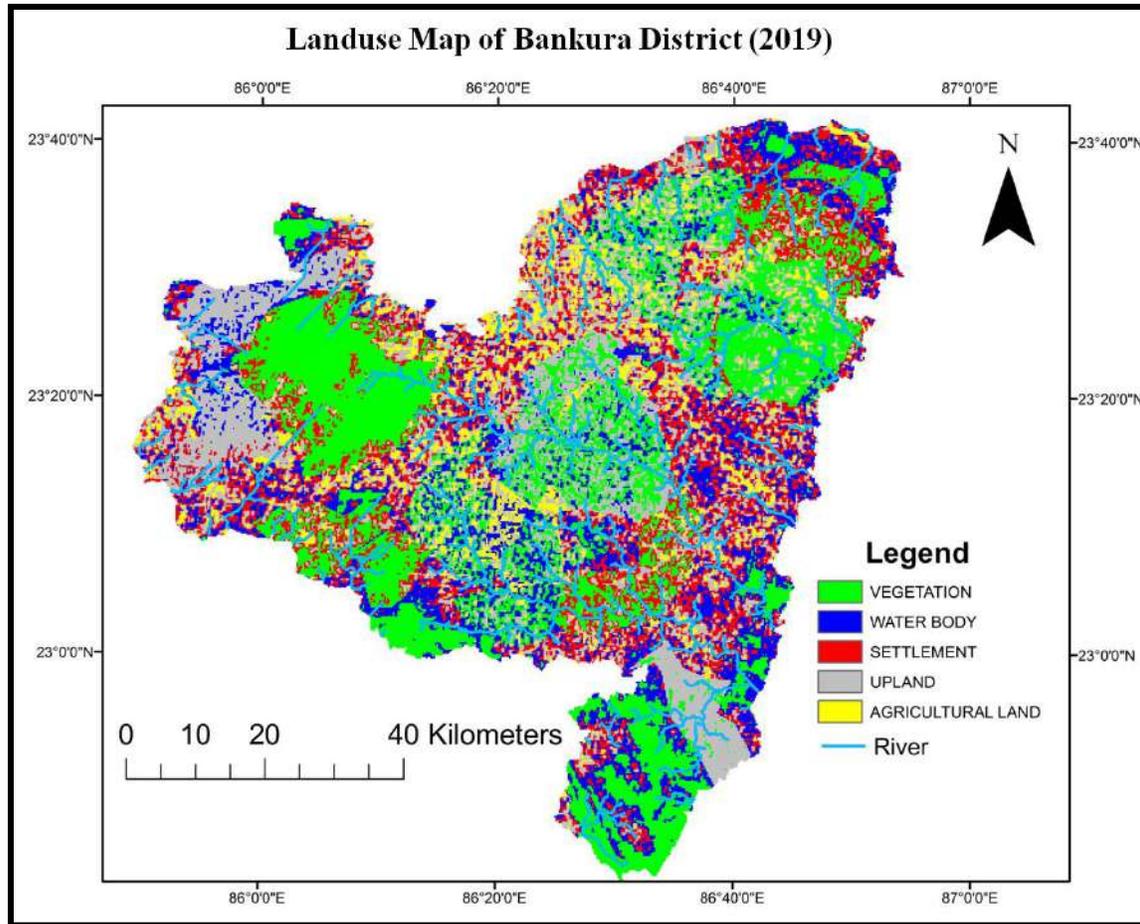
Edge Detection Segmentation

The edge of the object is in the form of discontinuous local features of the image, that is, the most significant part of the image changes in local brightness, such as the gray value of the mutation, color mutation, texture changes and so on. The use of discontinuities is to detect the edges and to achieve the purpose of image segmentation.

Regional Growth Segmentation

The regional growth method is a typical serial region segmentation algorithm, and its basic idea is to have similar properties of the pixels together to form a region. The method requires first selecting a seed pixel and then merging the similar pixels around the seed pixel into the region where the seed pixel is located.

LANDUSE MAP



INTERPRETATION:

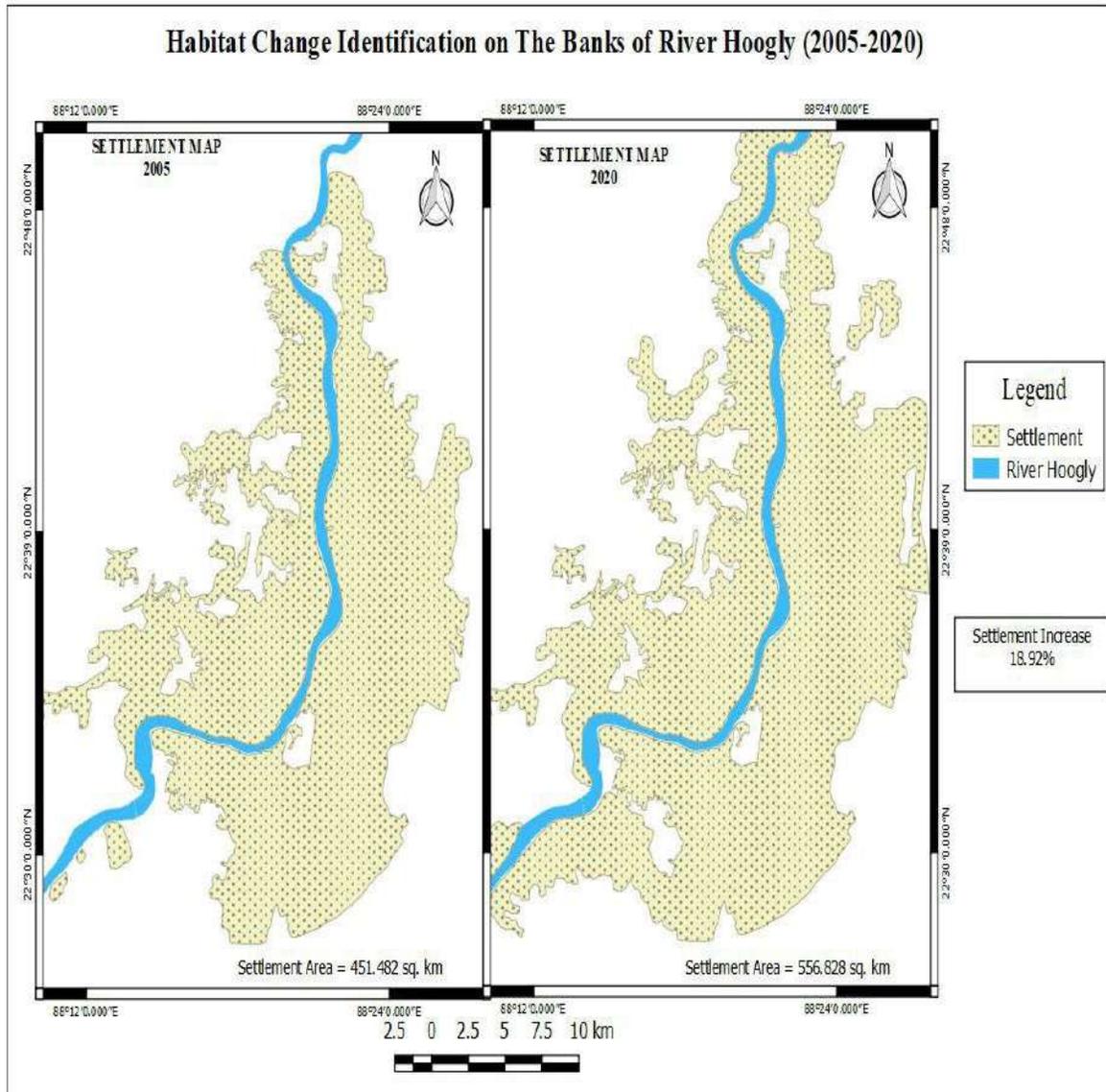
Here we have prepared a land use map of Purulia District. A major part of the area is covered by agricultural land (34.44971 sq. km). In this land use map 4.3496 sq. km, 15.3275 sq. km, 20.9375 sq. km, and 24.9356 sq. km area are covered by settlement, reservoir, vegetation and marshy land respectively.

Mapping of human habitation and detection of change from multi-dated maps

Habitat mapping is an analysis or survey of an area's ecology, including the identification of wildlife habitats. Additional mapping information may include the existence of dominant species and/or conservation areas. Local governments approach habitat mapping in several different ways, often depending on why the local community is surveying the area. However, "computer-based data storage, manipulation and presentation are becoming the norm. Once a local community performs a habitat mapping, it may utilize the information for several purposes, including land use planning, conservation management, public awareness, habitat creation, preservation, and other reasons. Ordinances may require developers to comply with the mapping, to show that the proposed development will not harm habitats, or to perform the mapping.

The first step in creating a habitat map is to use a mathematical formula to determine the "geographic coordinates to Earth's surface" and represent them in two dimensions, which becomes a projection that imitates or estimates Earth's shape. Once the map is created, then a coordinate system is used to assign points on the flat surface of the map (usually longitude and latitude). Once this system is in place, the community can determine which priorities and characteristics will be a part of the habitat map. A team of experts is then dispersed to gather information about the habitats in that area as well as species composition or any other pertinent information. Spectral, spatial, and temporal consistency and comparability of images are essential in CD. Bias or false detections should not overshadow real phenomena for revealing accurate change. Preprocessing procedures are essential to generate consistent data and to avoid such errors. Borrowing the concept from data mining, preprocessing involves data integration, cleaning, normalization, and transformation. Data integration is an important step to identify redundancies and inconsistencies while matching and arranging datasets. Integrating remote sensing data relates to aligning images through rectification and co-registration using the same reference and control points. In addition, it involves reprojecting and resampling images from various formats into a common format to allow a comparison. Data cleaning is an essential procedure for reducing noise and for handling missing data and it includes atmospheric correction and cloud masking for optical images or filtering speckles for microwave data. Various strategies and techniques related to preprocessing are used to examine image quality, to deal with error correction, and to tackle noise that causes missing data or complicates visualization and interpretation. Normalizing images is necessary to produce consistent yet comparable datasets, particularly, when multitemporal or time series observations are involved [1]. Meanwhile, transformation is used to enhance data quality or to highlight features by reducing dimensions or combining layers of multispectral images to represent biophysical properties

HABITAT CHANGE MAP



INTERPRETATION:

The above map displayed the habitat change on the banks of river Hooghly. Here we have taken 2 satellite maps (year of 2005 and 2020) of the bank of the Hooghly river. The map shows that, the settlement of the mentioned area has increases about 18.92%.

$$\% \text{ of Settlement change} = \left[\frac{\text{Area of 2020} - \text{Area of 2005}}{\text{Area of 2005}} \right] * 100$$

3.4. Spatial plan formulation and layout for a Gram Panchyat planning based on the above techniques

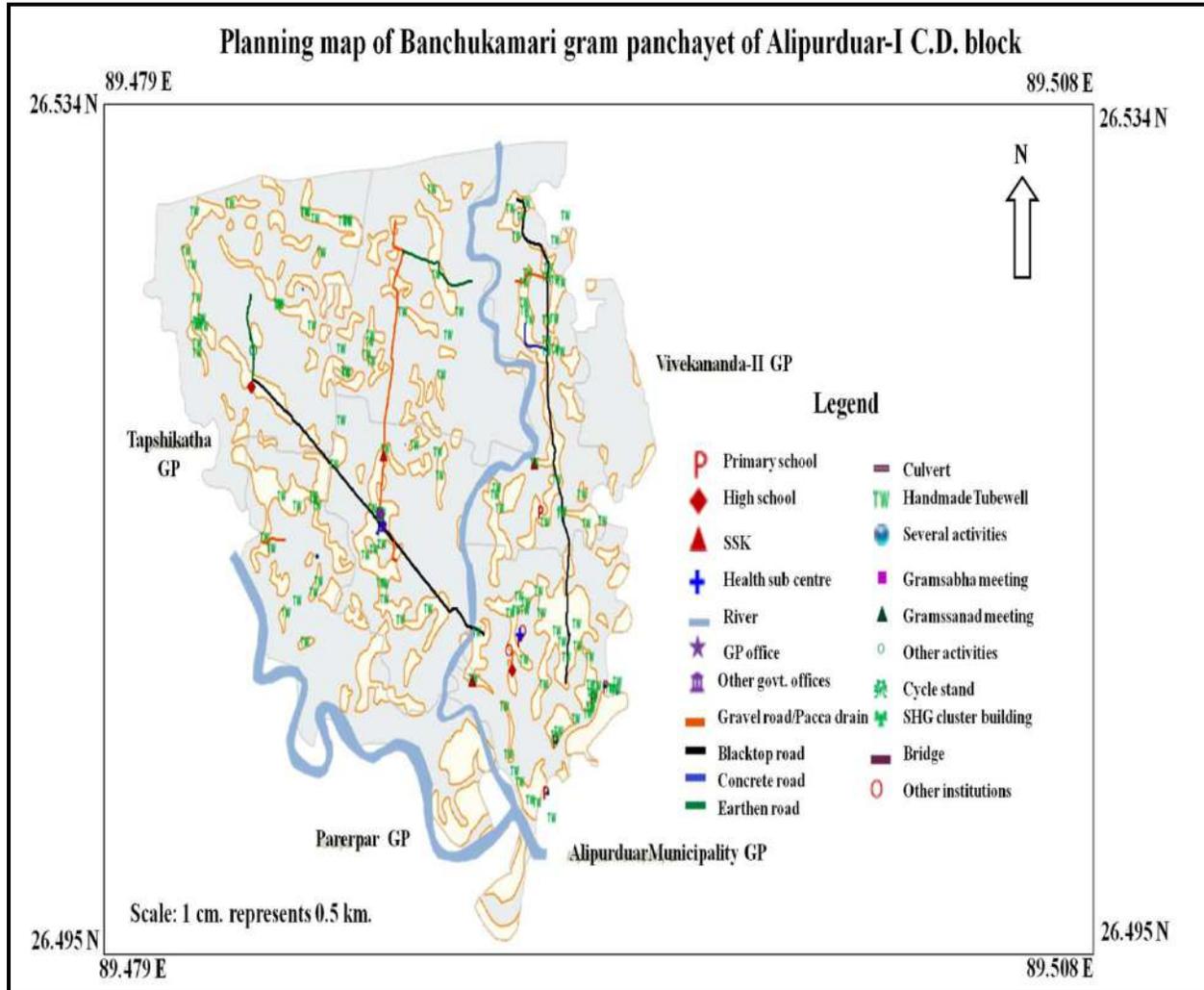
Spatial planning mediates between the respective claims on space of the state, market, and community. In so doing, three different mechanisms of involving stakeholders, integrating sectoral policies and promoting development projects mark the three schools of transformative strategy formulation, innovation action and performance in spatial planning.

Spatial planning systems refer to the methods and approaches used by the public and private sector to influence the distribution of people and activities in spaces of various scales. Spatial planning can be defined as the coordination of practices and policies affecting spatial organization. Spatial planning is synonymous with the practices of urban planning in the United States but at larger scales and the term is often used in reference to planning efforts in European countries. Discrete professional disciplines which involve spatial planning include land use, urban, regional, transport and environmental planning. Other related areas are also important, including economic and community planning, as well as maritime spatial planning. Spatial planning takes place on local, regional, national and inter-national levels and often results in the creation of a spatial plan.

An early definition of spatial planning comes from the European Regional/Spatial Planning Charter³¹ (often called the 'Torremolinos Charter'), adopted in 1983 by the European Conference of Ministers responsible for Regional Planning (CEMAT): "*Regional/spatial planning gives geographical expression to the economic, social, cultural and ecological policies of society. It is at the same time a scientific discipline, an administrative technique and a policy developed as an interdisciplinary and comprehensive approach directed towards a balanced regional development and the physical organization of space according to an overall strategy.*"

Numerous planning systems exist around the world. The form of planning largely diverges and co-evolves with societies and their governance systems. Every country, and states within those countries, have a unique planning systems that is made up by different actors, different planning perspectives and a particular institutional framework. Perspectives, actors and institutions change over time, influencing both the form and the impact of spatial planning. Especially in Northwestern Europe spatial planning has evolved greatly since the late 1950s. Until the 1990s, the term 'spatial' was used primarily to refer to the way that planning should deal with more than simply zoning, land use planning, or the design of the physical form of cities or regions, but also should address the more complex issues of the spatial relationship of activities such as employment, homes and leisure uses.¹

SPATIAL PLANNING MAP OF GRAM PANCHAYAT



Bhairab Ganguly college

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Roll : BGC/MGF/SIV/21 **NO.** : 308

Semester : 4Th (PG)

Geography practical note book

CONTENT

1. Research
2. Research data
3. Questionnaire and schedule
4. Research Methodology
5. Research Hypothesis
6. Focus group discussion
7. Post field techniques
8. Demographic data analysis (population composition , age structure , sex ratio , population pyramid , dependency ratio , occupational structure , Migration)
9. Land use map
10. Human habitation
11. Village planning map

RESEARCH

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words, research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods. Inductive approaches are associated with qualitative research and Deductive approaches are associated with quantitative research.

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

Methods of Qualitative Research	
Observations	Recording what you have seen, heard, or encountered in detailed field notes.
Interviews	Personally asking people questions in one-on-one conversations.
Focus groups	Asking questions and generating discussion among a group of people.

Methods of Quantative Research

Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, **questionnaires**, and surveys, or by manipulating pre-existing statistical data using computational techniques.

Characteristics of Good Research

- Good research follows a systematic approach to capture accurate data.
- Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

Research Data

Valid – founded, logical, rigorous, and impartial.

Accurate – free of errors and including required details.

Reliable – other people who investigate in the same way can produce similar results.

Timely – current and collected within an appropriate time frame.

Complete – includes all the data you need to support your business decisions.

Questionnaire and Schedule

Questionnaire vs schedule



- Questionnaires generally sent through mail and no further assistance from sender.
- Questionnaire is cheaper method.
- Non response is high.
- In questionnaire Identity of respondent is unknown.
- Very slow method.
- No personal contact.
- Schedule is generally filled by enumerator or research worker
- Costly, requires field workers
- Non response is low
- In schedule Identity of person is known.
- Information is collected well in time.
- Direct personal contact

RESEARCH METHODOLOGY

Literature search on research problem stated

- Do literature review.
- Identify research gap.
- Identify research problem.
- Do the research

Framing research question and hypothesis

- Identify research gap.
- Selection of method.
- Specific assumption > Null and alternative hypothesis
- Test the assumption.
- End result.
- Give suggestion.

Selecting study area and target population

- Identify the problem of a specific study area.
- No previous work on that problem.
- Select the problem for mitigation.
- Identify the victimized people.
- Do primary survey.

- Mitigate the problem.
- Do the research.

Collection of data

- Visit several websites.
- Visit several govt. offices.
- Justify authenticity and validity of the data.
- Check the research requirements.
- Always update self about the availability of the data.
- Make research objective flexible enough to match the requirement of the data .

RESEARCH HYPOTHESIS

A hypothesis is a statement that introduces a research question and proposes an expected result. It is an integral part of the scientific method that forms the basis of scientific experiments. Therefore, we need to be careful and thorough when building our hypothesis. A minor flaw in the construction of our hypothesis could have an adverse effect on our experiment.

OBJECTIVES:

- Describe the important sources for the selection or identification of research problems,
- Explain what is meant by the ‘definition’ of the problem,
- Describe the criteria which are helpful in the evaluation of a research problem, and
- Explain the meaning of hypothesis, what its importance is, and types of hypotheses.

Characteristics of a Good Hypothesis:

There are some important aspects to be looked into to judge the worth of a hypothesis in research. A good hypothesis must be:

- i) consistent with known facts and theories, and might be even expected to predict or anticipate previously unknown data,
- ii) able to explain the data in simpler terms,
- iii) stated in the simplest possible terms, depending upon the complexity of the concepts involved in the research problem.

Types of Research Hypothesis

Research hypothesis can be classified into seven categories as stated below:

1. Simple Hypothesis

It predicts the relationship between a single dependent variable and a single independent variable.

2. Complex Hypothesis

It predicts the relationship between two or more independent and dependent variables.

3. Directional Hypothesis

It specifies the expected direction to be followed to determine the relationship between variables, and is derived from theory. Furthermore, it implies researcher's intellectual commitment to a particular outcome.

4. Non-directional Hypothesis

It does not predict the exact direction or nature of the relationship between the two variables. Non-directional hypothesis is used when there is no theory involved or when findings contradict previous research.

5. Associative and Causal Hypothesis

Associative hypothesis defines interdependency between variables. A change in one variable results in the change of the other variable. On the other hand, causal hypothesis proposes an effect on the dependent due to manipulation of the independent variable.

6. Null Hypothesis :

Its state a negative statement to support the researchers findings that there is no relation between two variables.

7. Alternative Hypothesis :

Its state that there is a relationship between two variables of the study and that the result are significant to the research topic.

How to formulate :

1. Define Variables
2. Study In-Depth the Variables
3. Specify the Nature of Relationship
4. Identify Study Population
5. Make Sure Variables are Testable

EXAMPLES:

***Example 1* The greater number of coal plants in a region (independent variable) increases water pollution (dependent variable).**

If we change the independent variable (building more coal factories), it will change the dependent variable (amount of water pollution).

***Example 2* What is the effect of diet or regular soda (independent variable) on blood sugar levels (dependent variable)?**

If we change the independent variable (the type of soda we consume), it will change the dependent variable (blood sugar levels)

We should not ignore the importance of the above steps. The validity of our experiment and its results rely on a robust testable hypothesis. Developing a strong testable hypothesis has few advantages, it compels us to think intensely and specifically about the outcomes of a study. Consequently, it enables us to understand the implication of the question and the different variables involved in the study. Furthermore, it helps us to make precise predictions based on prior research. Hence, forming a hypothesis would be of great value to the

research. Here are some good examples of testable hypotheses.

FOCUS GROUP DISCUSSION

This is frequently used as qualitative approach to gain an in depth understanding of social issues. It involves gathering people from similar backgrounds and discuss a specific topic of interest. All members are free to talk with other group members. It involves usually 8 to 12 people and its lead by a moderator. The group discussion should be planned carefully to create a non-intimidating environment. Participants can give their honest opinions. The focus group discussion technique based on a review of application of conversation in last two decades. FGD are a good way to gather information about a communities through the participants opinions on particular topic. It consists with 4 major steps that include Research Design , Data Collection , Analysis , Reporting of Results . Due to this FGD its become helpful for rural people as well as rural development. There are 5 types of focus group discussion such as-

Single focus group, Two way focus group , Dual moderator focus group , Respondent moderator focus group ,Mini focus group.

FGD helps in gaining insights into peoples shared understanding of everyday life and the ways in which individuals are influenced by others in a group discussion . participants should have all their questioned planned ,it also helped to feel free to change the order or ask the question if someone brings something new then it will be relates to a later question.

POST FIELD TECHNIQUES

Field research typically begins in a specific setting although the end objective of the study is to observe and analyze the specific behavior of a subject in that setting. The cause and effect of a certain behavior, though, is tough to analyze due to presence of multiple variables in a natural environment. Most of the [data collection](#) is based not entirely on cause and effect but mostly on correlation. While field research looks for correlation, the small [sample size](#) makes it difficult to establish a [causal relationship](#) between two or more variables.

Methods of Field Research

Field research is typically conducted in 5 distinctive methods. They are:

- **Direct Observation**

In this method, the data is collected via an [observational method](#) or subjects in a natural environment. In this method, the behavior or outcome of situation is not interfered in any way by the researcher. The advantage of direct observation is that it offers contextual data on people, situations, interactions and the surroundings. This method of field research is widely used in a public setting or environment but not in a private environment as it raises an ethical dilemma.

- **Participant Observation**

In this method of field research, the researcher is deeply involved in the research process, not just purely as an observer, but also as a participant. This method too is conducted in a natural environment but the only difference is

the researcher gets involved in the discussions and can mould the direction of the discussions. In this method, researchers live in a comfortable environment with the participants of the research, to make them comfortable and open up to in-depth discussions.

- **Ethnography**

Ethnography is an expanded observation of [social research](#) and social perspective and the cultural values of an entire social setting. In ethnography, entire communities are observed objectively. For example, if a researcher would like to understand how an Amazon tribe lives their life and operates, he/she may choose to observe them or live amongst them and silently observe their day-to-day behavior.

The post field techniques are data analysis , communicating the result after the case study.

1. **Data Analysis:** [Analysis of the data](#) that is collected is important to validate the premise of the field research and decide the outcome of the field research.
2. **Communicating Results:** Once the data is analyzed, it is important to communicate the results to the stakeholders of the research so that it could be actioned upon.

Field Research Notes

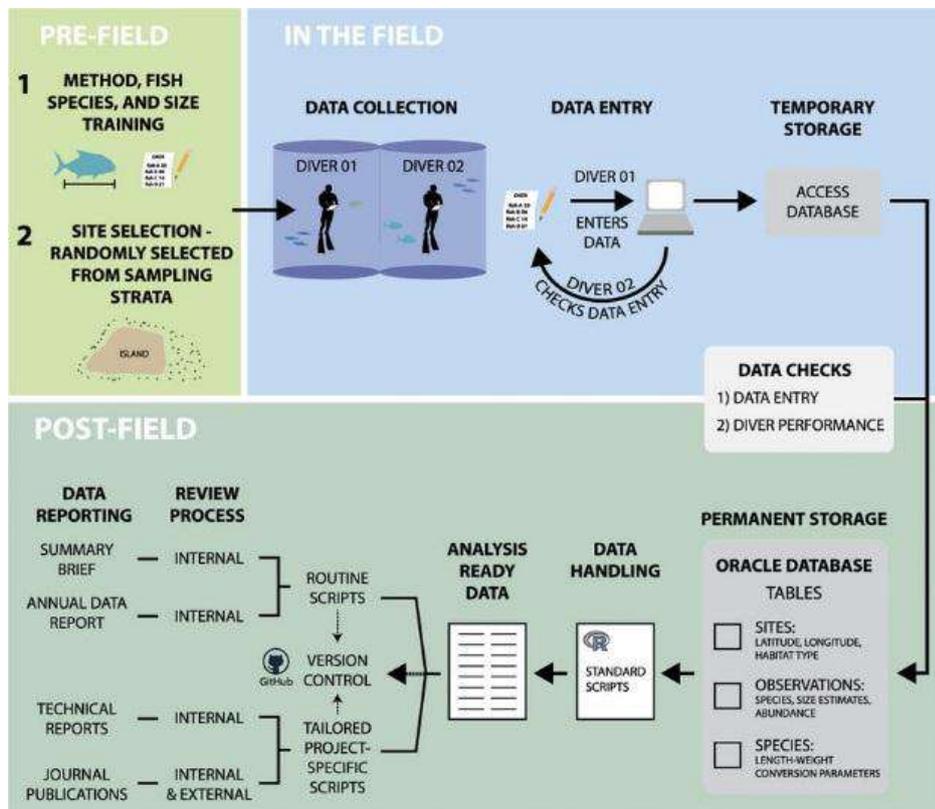
Keeping an [ethnographic record](#) is very important in conducting field research. Field notes make up one of the most important aspects of the ethnographic record. The process of field notes begins as the researcher is involved in the [observational research](#) process that is to be written down later.

Types of Field Research Notes

The four different kinds of field notes are:

- **Job Notes:** This method of taking notes is while the researcher is in the study. This could be in close proximity and in open sight with the subject in study. The notes here are short, concise and in condensed form that can be built on by the researcher later. Most researchers do not prefer this method though due to the fear of feeling that the respondent may not take them seriously.
- **Field Notes Proper:** These notes are to be expanded on immediately after the completion of events. The notes have to be detailed and the words have to be as close to possible as the subject being studied.
- **Methodological Notes:** These notes contain methods on the research methods used by the researcher, any new proposed [research methods](#) and the way to monitor their progress. Methodological notes can be kept with field notes or filed separately but they find their way to the end report of a study.
- **Journals and Diaries:** This method of field notes is an insight into the life of the researcher. This tracks all aspects

of the researchers life and helps eliminate the Halo effect or any bias that may have cropped up during the field research.



Source: www.researchgate.net

So , here is the techniques of post fields data checks , storage, data handling , analysis , review and reporting(summary brief, annual data, technical report , journal publications).

POPULATION COMPOSITION

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

THE AGE STRUCTURE

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives

SEX RATIO

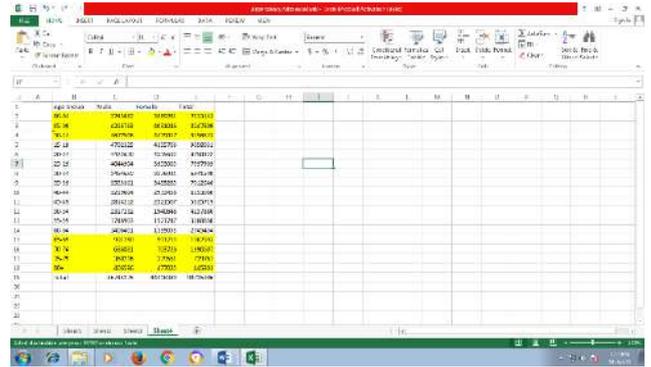
The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population

THE POPULATION PYRAMID

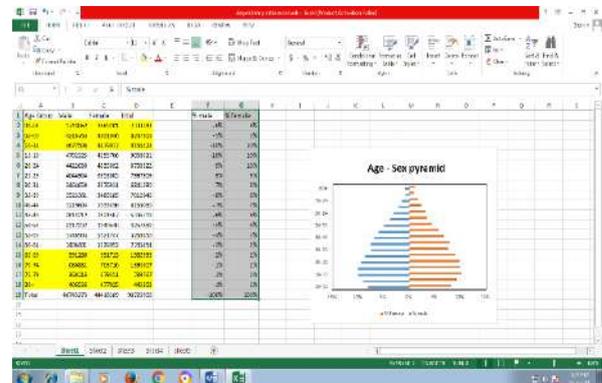
The key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration., especially for young adult males.

Steps

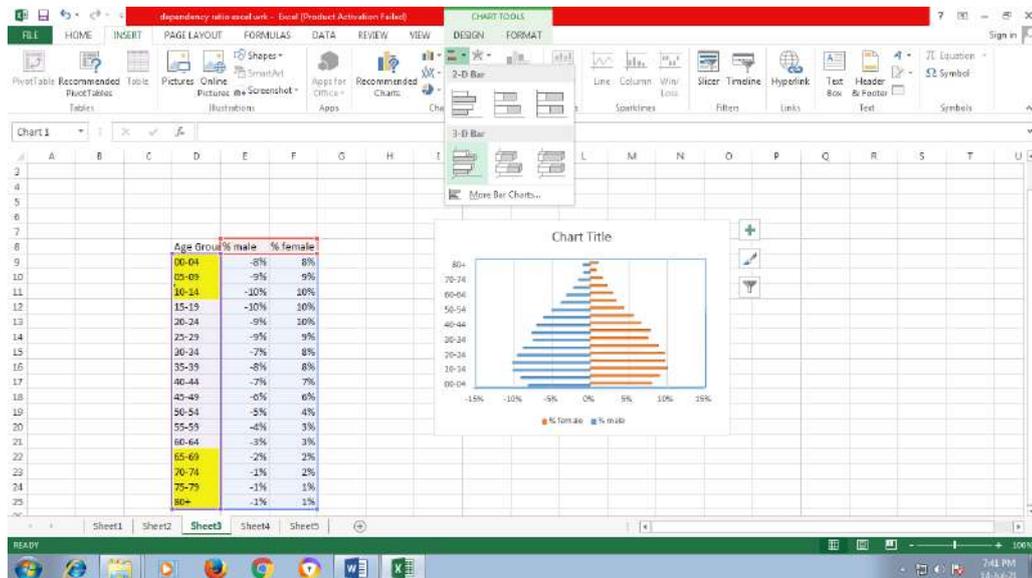
1. open MS-excel > put the data
> age group > male > female
> total

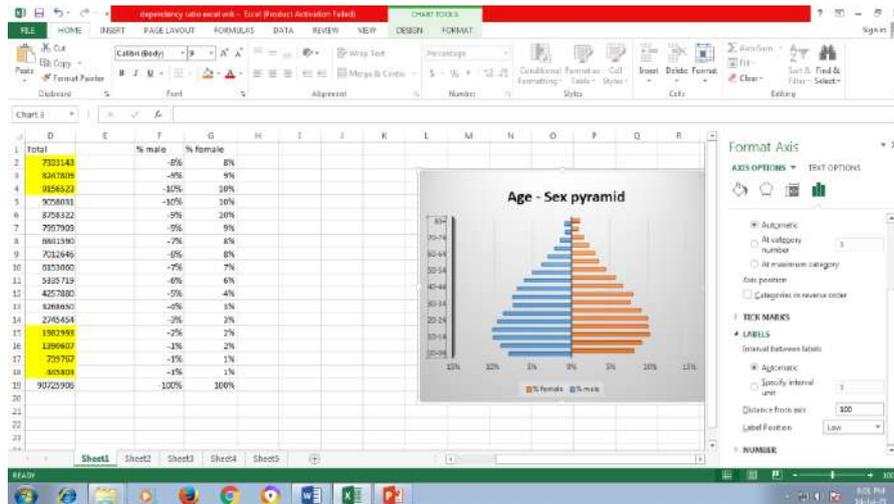


2. calculate the % of the data of male and female population > put the formula for % > for male =0-(cell no./ cell no.\$)> for female =0+ (cell no./ cell no.\$)> sum sum all the %.

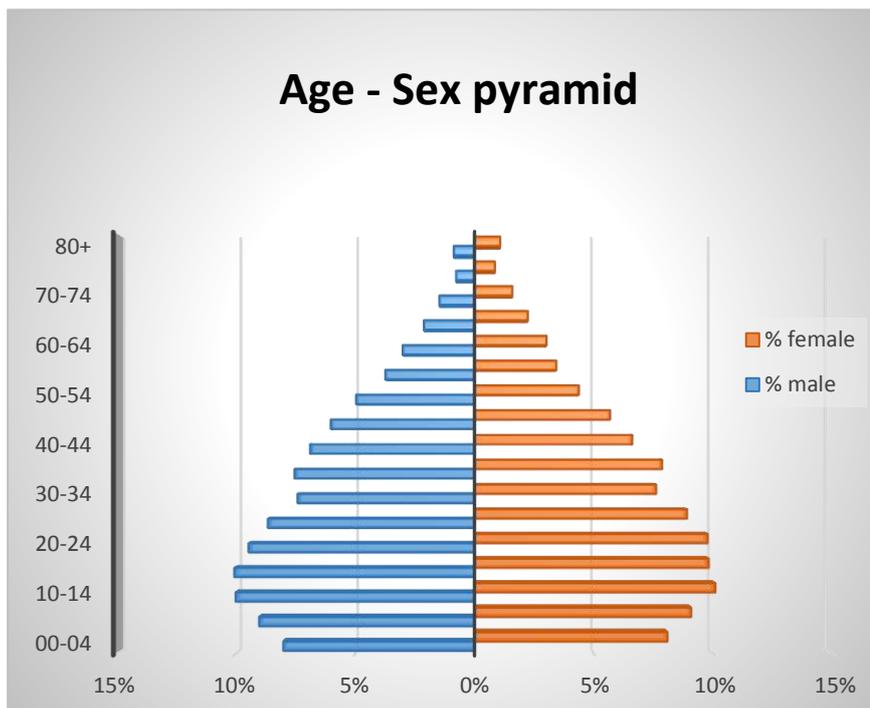


3. after calculating the % select data and go to insert and select a suitable bar .





4. select the chart title > click on age group > format axis > labels > label position low> after this to remove – from horizontal axis right click on it > format axis > open tool box > go to number .> click on custom > add the formatting code.



5. after convert this into + the select legend by using format legend.

According to 2011 this pyramid indicates population that represent graphically and this is the summation of population history. Its used to compare male and female population of an area. In this graph it can be seen that 10-14 and 15-19 male percentage was highest and for female 10-14,15-19 and 20-24 percentage was highest.

DEPENDENCY RATIO

The dependency ratio is an age population ratio of those typically not in the labor force (the dependent part ages 0- 14 and above 65) and those typically in the labor force (the productive part ages 15-64). Its used to measure pressure on the productive population.

The dependency ratio is generally computed by diving the number of children plus old people by the number of adults and multiplying it by hundred . The dependency ratio is governed largely by the age structure of the population.

Formula : dependent part usually includes 0 – 14 and 65+ and productive makes up the population in between 15 to 64. Its expressed as a percentage .

Dependency ratio = (number of people age 0-14) + (number of people age 65 and 65+) /number of people aged 15-64 * 100

$$\text{(Total) Dependency ratio} = \frac{(\text{number of people aged 0 to 14}) + (\text{number of people aged 65 and over})}{\text{number of people aged 15 to 64}} \times 100$$

The dependency ration can be decomposed into the child dependency ratio and the aged dependency ratio.

$$\text{Child dependency ratio} = \frac{\text{number of people aged 0 to 14}}{\text{number of people aged 15 to 64}} \times 100$$

$$\text{Aged dependency ratio} = \frac{\text{number of people aged 65 and over}}{\text{number of people aged 15 to 64}} \times 100$$

Steps:

The screenshot shows an Excel spreadsheet titled 'dependency ratio excel.xlsx - Excel (Product Activation Failed)'. The spreadsheet contains the following data:

Age Group	Male	Female	Total	Dependency Ratio
00-04	3,743,862	3,589,281	7,333,143	
05-09	4,216,763	4,031,046	8,247,809	
10-14	4,677,506	4,479,017	9,156,523	
15-19	4,702,325	4,355,706	9,058,031	
20-24	4,422,650	4,335,682	8,758,332	
25-29	4,044,904	3,933,005	7,977,909	
30-34	3,464,659	3,376,931	6,841,590	
35-39	3,323,361	3,489,283	7,012,644	
40-44	3,219,604	2,933,456	6,153,060	
45-49	2,814,212	2,521,307	5,335,519	
50-54	2,317,232	1,940,648	4,257,880	
55-59	1,746,903	1,521,747	3,268,650	
60-64	1,406,401	1,339,053	2,745,454	
65-69	991,280	991,713	1,982,993	
70-74	686,881	705,726	1,392,607	
75-79	360,216	379,551	739,767	
80+	406,336	477,023	883,359	
Total	46,745,275	44,416,369	91,161,644	47.69167742

1. First put the data > put the formula for **0 to 14** years = sum (cell no : cell no)
2. Then put the formula for **65 to 80+** =sum (cell no : cell no)
3. After that calculate **15 to 65** years = sum (cell no : cell no)
4. For calculating the dependency ratio used this formula

$$=((\text{first sum} + \text{second sum}) / \text{third sum}) * 100$$

0-4,5-9,10-14 and above 65+ people are under the dependency ratio. They are dependent on 15 – 64 age group of people. So the dependency ratio is 47.69167742. The summation of total dependency people is 29,296,645 according to census 2011 and the summation of independent or productive people is 61429261.

OCCUPATIONAL STRUCTURE

occupational structure This refers to the aggregate distribution of **occupations** in society, classified according to skill level, economic function, or social status. ... Such classifications are also used as a basis for the empirical analysis of economic and social class. It shaped by various factors : the structure of economy , technology , labour market that determines the condition attached to occupation.

The occupational structure is described and analysed by means of various classificatory schemes, which group similar occupations together according to specific criteria such as skill, employment status, or function. Such classifications are also used as a basis for the empirical analysis of economic and social class. That also include INDUSTRIAL SECTOR.

The primary economic sector therefore includes agriculture, horticulture, forestry, and fishing; the extraction of oils, minerals, and natural gas, mining and quarrying and the water industry. These may also be referred to as primary industries. The secondary economic sector is often termed the manufacturing sector or manufacturing industries. The construction industry is sometimes included, but sometimes treated as a separate category.

So ,**occupational structure** refers to the division of its work force engaged in different economic activities. Globally world bank estimation about 55% women of prime working have job and that some 40% of the worlds all workers women. Here we shown the work participation rate of male and female.

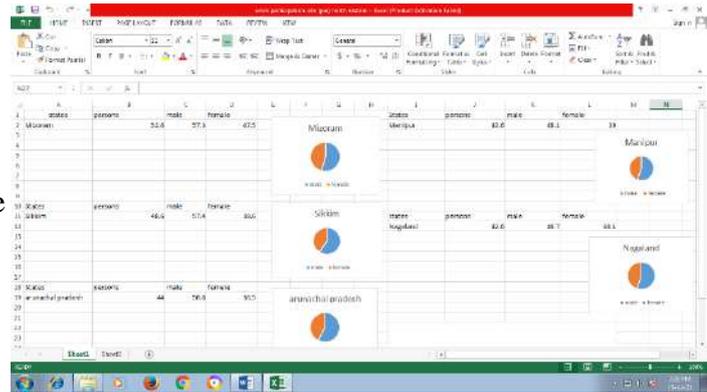
Since there is a large variety of occupations in the world and the number of occupations also varies from country to country. The occupational structure sometimes is difficult to comprehend due to similar reasons. It is due to various occupations are classified in industrial categories .

The 1971 Indian Census adopted the following industrial classification:

- (i) Cultivation,
- (ii) Agricultural labour,
- (iii) Livestock, forestry, fishing, hunting, plantations, orchards and allied activities,
- (iv) Mining and quarrying,
- (v) Manufacturing, processing, servicing and repairs
 - (a) Household industry
 - (b) Other than household industry
- (v) Construction
- (vi) Trade and Commerce
- (viii) Transport and storage

steps:

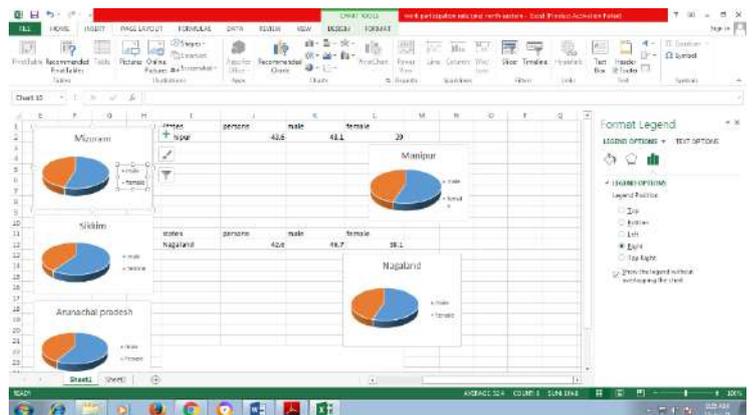
1. for shown work participation rate between male and female we select the north eastern state. First put the data of male female work participation rate.

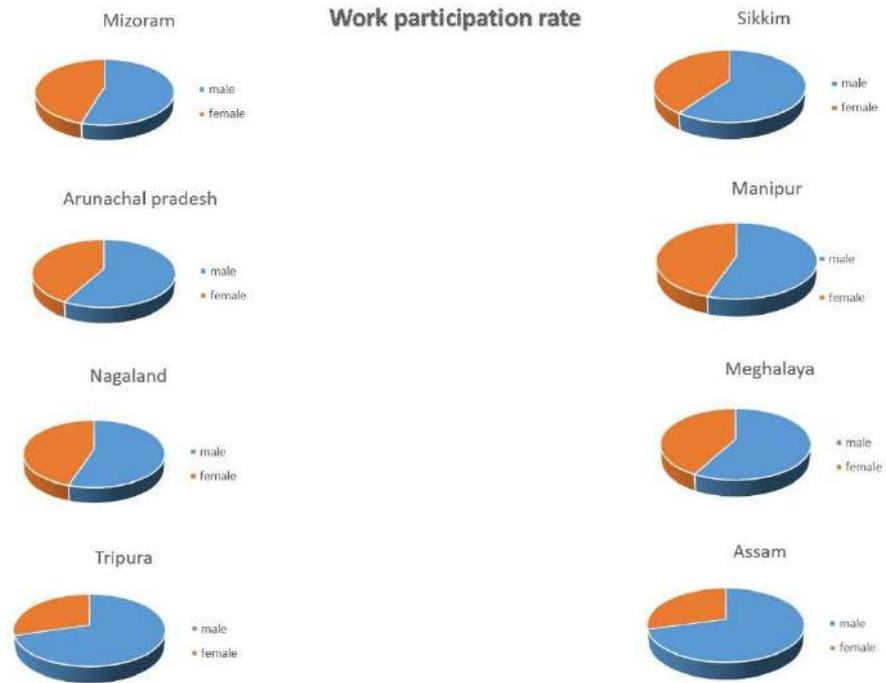


2. After putting the data select the state > male female percentage > go to insert > charts > choose any pie graph > and do the same for all rest of the states.



3. Then put the legend > select this > right click > format axis > select side .



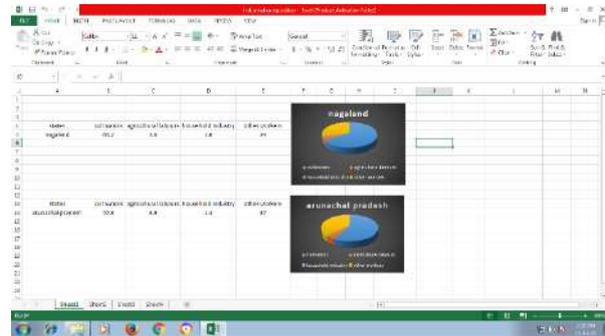


4. now we compile all the pie graph where we can see the work participation rate(percentage) in Mizoram 57.3(male) and 47.5 (female) ,for Sikkim its 57.4 and 38.6. in Arunachal Pradesh the work participation rate of male and female is 50.6 and 36.5. whereas Manipur's work participation rate is 48.9 for male and 39. In Nagaland male and female work participation rate is 46.7 and 38.1. rest of the three states Meghalaya , Tripura , Assam where the work participation rate of male and female is 48.3 (male) 38.1 (female) , 50.6(male) 21.1(female) , 49.9(male) 20.7(female). So we can conclude that female participation rate in work field is less than men. Here we interperate all the north eastern states working participating rate of male and female.

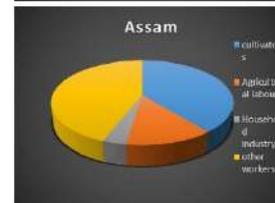
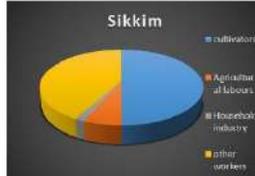
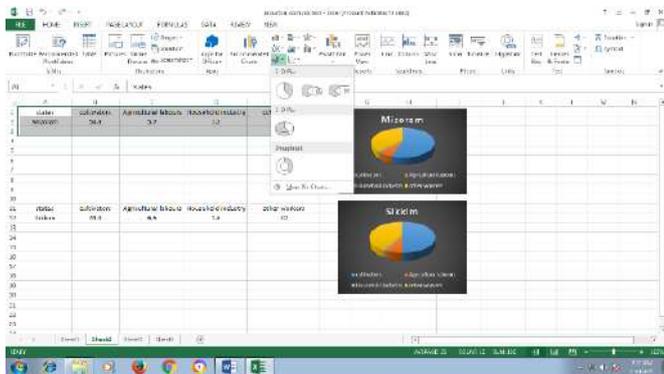
Now will shown the different sectors of occupational structure through the pie graph.

Steps:

1. Same as before we put the data and we select north eastern states with cultivators , agricultural labors , households and other works elements.



2. then select the state with those elements > insert > charts > select any pie graph as your choice > select legend > right click on it > format legend > select any side (right) .



3. Same as before compile all the pie graph where we see all the north eastern states with different sectors of occupational structure. For Nagaland cultivators has (percentage) 64.7 , agricultural labor 3.6 , household workers 2.6 and other workers is 29. For Arunachal Pradesh we see that cultivators is 57.8 , agricultural labor 3.9 , households 1.3 and other workers 37. In Mizoram we find 54.9 cultivators , 5.7 agricultural labors

, 1.5 household industry , 37.9 related to other works whereas Sikkim has 49.9 cultivators , 6.9 agricultural labors, 1.6 household industry and 42 involved into other works . For Meghalaya cultivators 48.1 , agricultural labor 17.7 , households 2.2 and other workers 32. On the other side Manipur has 40.2 cultivators , 12 agricultural labor , 10.3 house hold industry and 37.6 other workers .For Assam and Tripura cultivators 39.1,27 agricultural labor 13.2,23.8 household industry 3.6 , 3 other workers 44 , 46.1 (all are in percentage)

MIGRATION

The population increment between any two dates for any given geographic area is the result of natural increase (birth minus deaths) and net migratory movement. If the country is a closed one as far as population growth is concerned if there has been virtually no migration between the given country and other countries , then the net migratory movement for a given geographic area must be the result of internal migration, in-migration minus out migration where the population is not closed , problems arise in measuring the effects of internal migration.

The end of the interval in the absence of migration. The difference between the observed and expected numbers at the end of the interval, or the difference between the observed and the expected change, gives an estimate of" net change due to migration. the population of an area at two points in time and an estimate of natural increase during the interval, we can calculate the number that would be expected .

Approaches to estimating the expected population or the expected change are of two types: (a) through vital statistics and (b) through the use. of estimates of the probability of survival.

VITAL STATISTICS METHOD (VS)

Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put in the following simple form:

$$\text{Net } M = (P_{t+n}) - P_t - (B - D)$$

where for any given area Net M = net migration, P_t is the population at the earlier census, P_{t+n} is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to residents.

Examples:

1. Population of Madras, 1951 = p , = 1,416,056
2. Population of Madras, 1961 = p_{+1} = 1,729,141
3. Increase in population, 1951-1961 = (2) - (1) = 313,085

4. Number of births in Madras, 1951-1961 = $B = 653,190$
5. Number of deaths in Madras, 1951-1961 = $D = 371,286$
6. Natural increase in Madras, 1951-1961 = (4) - (5) = $281,904$
7. Net migration to Madras, 1951-1961 = (3)-(6) = $31,181$

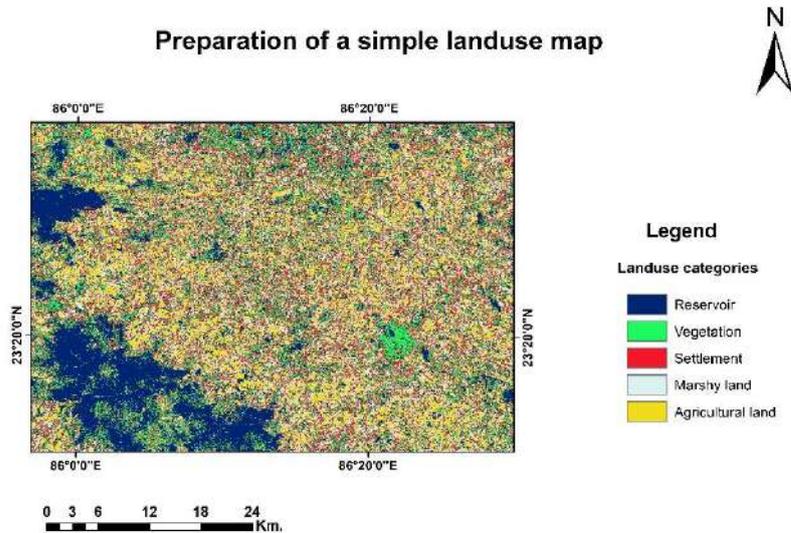
LANDUSE MAP

City planners need to know which areas of city are used for which purpose. Therefore, they produce a map of land use , that identifies parts of a city and the major activities that happen there. Remote sensing imagery is very useful for this purpose, since anyone certainly don't want to spend many weeks or months walking or driving around a city to map its land use. But to use remote sensing imagery effectively, you have to be able to interpret it accurately. The satellite image in this activity shows a part of downtown Montreal. It will be a bit harder to interpret this black and white image , because you don't have color clues to rely on. But there can see quite a bit of spatial detail even individual streets and large buildings.

land use category	meaning	looking for the image
water	river, pond	smooth dark areas with docks and bridges
-		
industrial	factory, rail yards	buildings , bare ground ,empty lots
-		

there is many other sectors such as residential and commercial its identify with rectangular street pattern , closely spaced house for park and recreation its identify by large grassed areas , winding paths , irregular buildings.

Preparation of a simple landuse map



Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

- Steps : 1. Layer > add layer > add raster layer > go to search box of processing tool box > search k means and select.
2. Select input image > put no. of classes > fill training size to 10000 > type output name to save the file > run > image shown on main canvas > click on output layer> properties > symbology > singleband psuedocolor.
 3. Select color map > equal interval > change the no. of classes 5 to 20 > ok

This is all about unsupervised classification using k means classification.

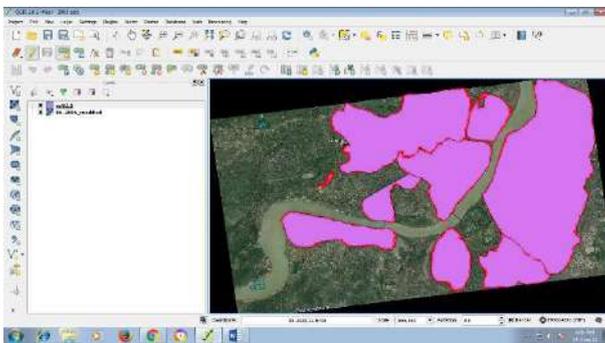
The area of settlement is 4.3496406, whereas reservoir area is become 15.3275296. This area covered with 20.937487 green vegetation and 24.9356352 , 34.4497075 area covered marshy land and agricultural land. In this land use map reservoir indicates with navy blue color , red indicates settlements , vegetation is green , yellow indicates agricultural land and white indicates marshy land. Here is generally refers the classification , that is unsupervised classification and divide into 5 groups. This two terms land cover and land use where land cover refers surface cover on ground like vegetation , water, bare soil etc but land use refers the proper uses of land cover or we can say that the purpose of land serves for example – agricultural , wild life conservation , land recreation. In this map the total area is 100.

Habitat change identification on the banks of river Hooghly (2005-2021)

Steps: 1. First download google earth > select the area and mark them as A,B,C,D and put lat and long > off the other criteria > and save the two years of map like 2005 and 2021.

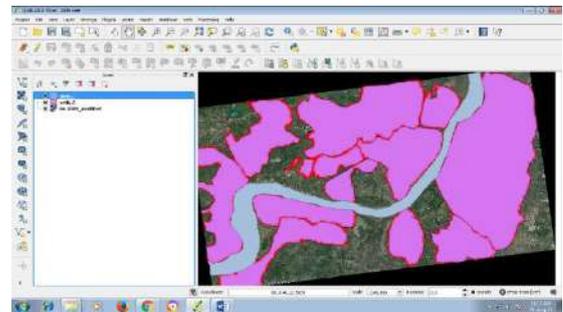


4. Open QGIS > raster > geo referencer > geo reference > add the map > add point > select X,Y as lat and long > transformation settings(WGS 84 ,45⁰ north) > Run > close and found this geo referenced map.



3. layer > create layer > new shape file layer > select polygon > save any folder > put the name > add attribute list > ok.
4. toggle editing on > add point > start digitization for settlement.

5. same as before took another layer for river digitization and from properties change the color option.



6. Right click on settlement layer > open attribute table > field calculator > put the name > decimal no. > precession 3 > double click on geometry > double on $\$area / 1000000$ > ok.

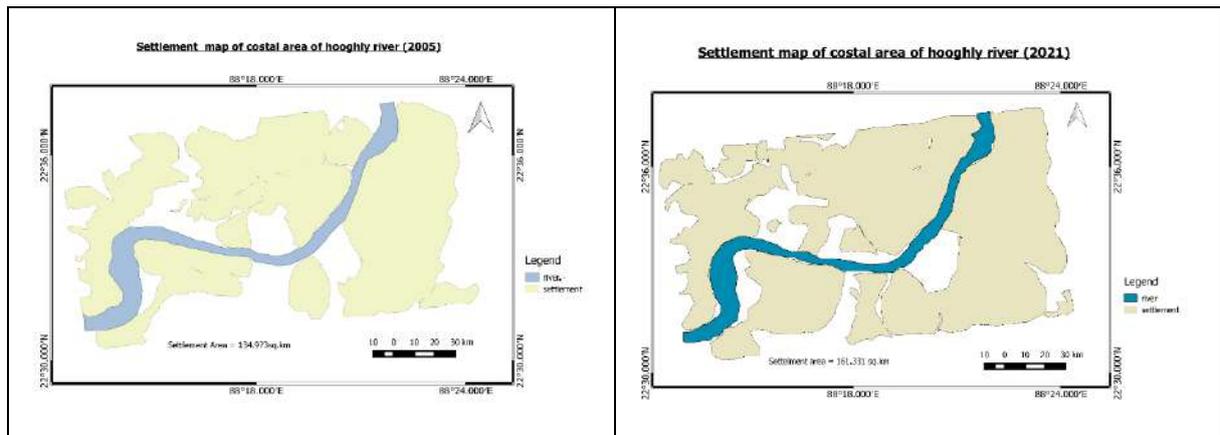


7. Then digitized the another one it may be 2021 year settlement map which is download from google earth and geo referenced in QGIS > do the same like 2005 year settlement map > calculate the area ($\$area/1000000$)

8. After digitization properties > style > change color > sample fill > no pen >

Border width 0 > apply > ok.

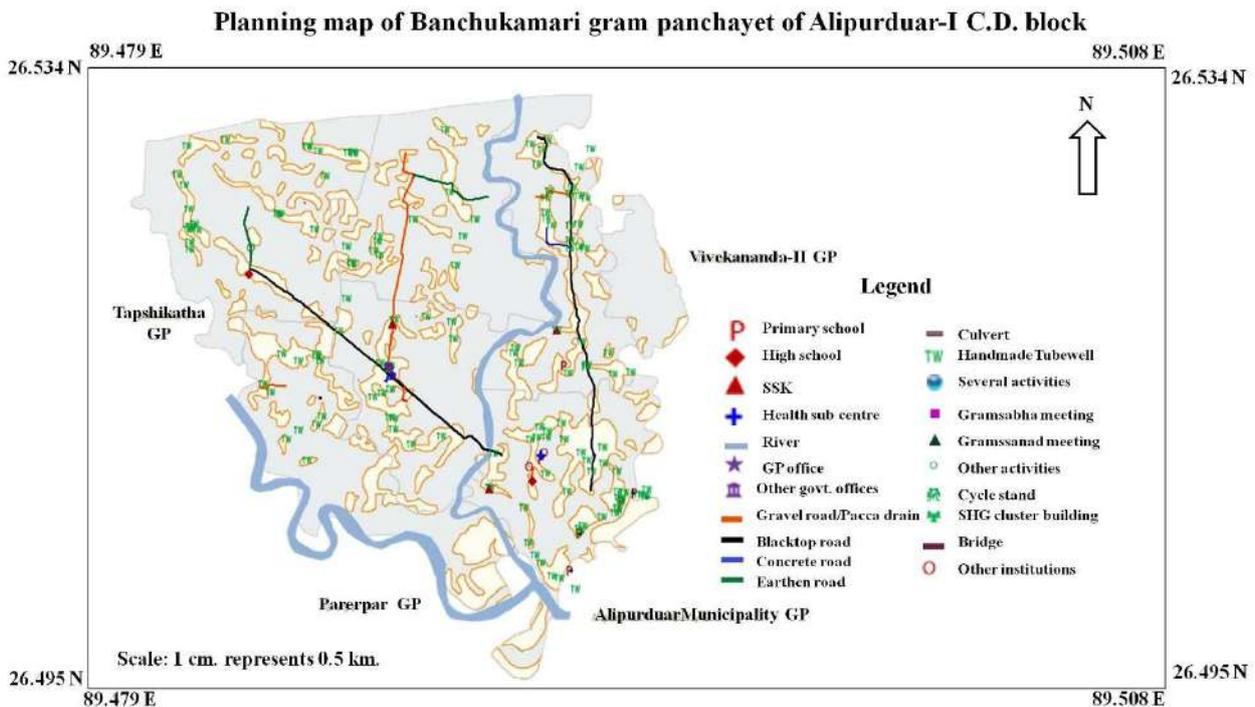
9. After summation the area of both year (2005, 2021) then put the formula $(2021 - 2005) / 2005 * 100$ then we can get the percentage of increasing the settlement area. For 2005 its 134.973sq.km and for 2021 its 161.331sq.km increasing of settlement is 16.337%.
10. Then do the thematic mapping > click on print composer > add map > add heading > add scale > north line arrow > grids > add latitude and longitude > add legend .



Here we see that the settlement area of Hooghly river increased 16.337% than 2005 . So besides this the common factor is population . As population has increased naturally settlement has also increasing.

Village Planning Map

Mapping is a spatial representation used as a descriptive and analytical tool for a wide range. There are three types of PRA tools that's are space related tools , time related tools , Mapping belongs to space related tools. Village planning map are effective tools to understanding the geography of village settlement. From this kind of map we can identify preschool, high school, river, health center, identify the infrastructure of the village , status of employment , this planning map helps in analysis and decision making activities at the rural level.



- Steps:**
1. Collect Mouza map from following gram panchayet
 2. Using QGIS geo reference the mouza map and clip the particular village boundary.
 3. Using GPS survey to collect important place like school , health center, police station .we found from gram panchayet by secondary data
 4. Plot the places as a point and digitized settlements also roads using QGIS
 5. At the end prepare a layout map and add legend , north lines , scale and heading of the map.

This is the village planning map of Banchukamari gram panchayet of alipurduar-I. from this map we can identify the infrastructure of this village . Through this map we can identify the number of primary school , high school , know about the health system and also we know about their income source even though we can identify the number off handmade tube wells are present in this area. Police station , administration building all are identify by the help of GPS survey bt in this case all are from gram panchayet map. This map help to locate any area of this cd block.

END

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CONTENT

1.RURAL RESEARCH METHODS AND METHODOLOGY

- ***PRE-FIELD ISSUES ON RURAL RESEARCH***
- ***ISSUES ON FIELD RESEARCH***
- ***FIELD TECHNIQUES***
- ***POST FIELD TECHNIQUES***

2.TECHNIQUES AND FORMATION OF RURALPLANNING THROUGH DATA ANALYSIS

- ***APPLICATION OF QUALITATIVE RESEARCH
TECHNIQUES***
- ***APPLICATION OF STATISTICAL TECHNIQUES IN
DEMOGRAPHIC DATA ANALYSIS***
- ***APPLICATION OG GIS AND RS***
- ***SPATIAL PLAN FORMATION AND LAYOUT FOR A
GRAM PANCHAYAT/VILLAGE LEVELPLANNING
BASED ON THE ABOVE TECHNIQUES AND ON
AVAILABLE INFORMATION FROM PRI.***

CONCEPT OF RESEARCH:

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words, research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods. According to American sociologist earl Robert babbie “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon.

Characteristics of Good Research

- Good research follows a systematic approach to capture accurate data.
- Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
 - Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
 - It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

TYPE OF RESEARCH

There are different types of research methods used in conducting research. There are two types of research methods----

1. QUALITATIVE RESEARCH
2. QUANTITATIVE RESEARCH

QUALITATIVE RESEARCH METHOD: the qualitative research method is descriptive and subjective irrespective of facts. Qualitative research involves collecting and analyzing non-numerical data (text, video, audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

1. in the qualitative research, the contexts of inquiry are natural and not predefined.
2. qualitative research is an interactive process in which researchers wish to have people who can speak for themselves and give their perspective.
3. The aim of qualitative research is to understand the experience of one as nearly as possible.
4. type of qualitative research is----- one to one interview, focus groups discussion, ethnographic studies, text analysis, case study.

QUANTITATIVE RESEARCH METHOD----- quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages make predictions test casual relationships, and generalize results to wider population. In qualitative research methodology, the analysis and measurement of data and relationship between variables are essential. Large scale and representative sets of data are required for adopting this type of research methods.

1. qualitative method provide precision as it uses reliable measurement.
2. it controls though design and sampling of data.
3. it can generate casual statements by control experiments.
4. in this method use statistical techniques that helps in sophisticated analysis.

Contemporary research trend

In the Indian context, villages are the heart of the nation but still it is growing fact that the rural population is suffering more consequences for livelihood as compared to urban areas. The difficulties of livelihood may be forcing rural population to migrate to the urban areas which is one of the major challenge. If situation remains same, urban growth will be unavoidable, as the economic pursuits and aspirations of the population always change and evolve.

Village developmental activities and plans were formulated by government in order to mitigate poverty, unemployment, illiteracy, malnutrition in kids, health problem and also to provide basic needs of livelihood. However, due to lack of implementation, many villages are still deprived of drinking water, sanitation facilities, primary health centers, equipped primary schools, electricity, proper road and public transportation system, banks and communication services. All these programs and Policy have met with limited success. The “Smart Village” concept could address these challenges comprehensively. All these programme and policies can converge in smart village development by adding smart solutions.

Literature search on research problem stated

- Do literature review
- Identify research gap.
- Identify research problem.
- Do the research.

Literature search is a systematic and well-organized search from the already published data to identify a breadth of good quality references on a specific topic. The reasons for conducting literature search are numerous that include drawing information for making evidence based guidelines, a step in the research method and as part of academic assessment.

However, the main purpose of a though literature search it to formulate a research question by evaluating the available literature with an eye on gaps still amenable to further research.

Research problem is typically a topic of interest and of some familiarity to the researcher.it needs to be channelized by focusing on information yet to be explored. Once we have narrowed down the literature may further straighten out the research approach.

Framing research question and hypothesis

- Identify research gap. -Selection of method.
- Specific assumption.
- Test the assumption.
- End result.
- Give suggestion.

Definition of Hypothesis: Hypothesis is an assumption that is made on the basis of some evidence. This is the initial point of any investigation that translates research questions into a prediction. It includes components like variables, population and there lation between the variables. A hypothesisisaformaltentativestatementoftheexpectedrelationshipbetweentwoormore variables under study. A hypothesis helps to translate the research problem and objective in to a clear explanation or prediction of the expected results or outcomes of the study.

Characteristics of Hypothesis: The characteristics of hypothesis are:

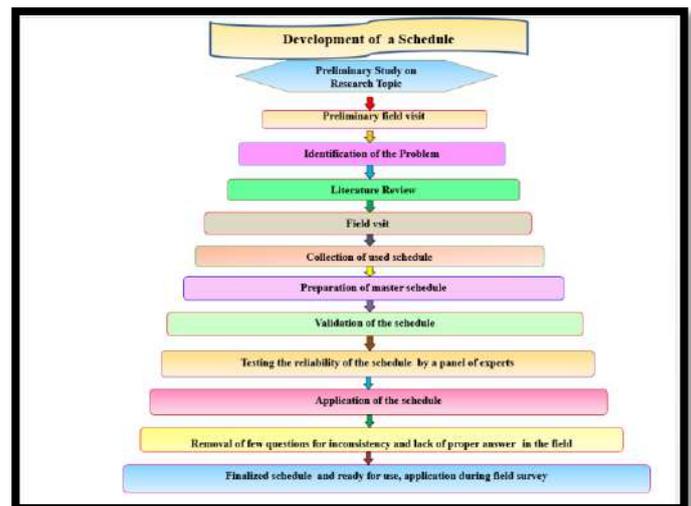
- The hypothesis should be related to a body of theory and concepts should be clearly defined.
- If the hypothesis is national hypothesis, then it should be stating there lationship between variables.
- The hypothesis must be specific and should have scope for conducting more tests.
- The way of explanation of the hypothesis must be simple and it should a lose understood that the simplicity of the hypothesis is not related to its significance.

Selecting study area and target population

- Identify the problem of a specific study area.
- No previous work on that problem.
- Select the problem for mitigation.
 - Identify the victimized people.
- Do primary survey.
- Mitigate the problem.
- Do the research.

Collection of data

- Visit several websites.
- Visit several govt. offices.
- Justify authenticity and validity of the data.
- Check the research requirements.
- Always update yourself about the availability of the data.
- Make research objective flexible enough to match the requirement of the data



Preparing survey scheduled and questionnaires'

The research process is incomplete without collection of data, which starts after identification of research problem and chalking out research design. The researcher should keep in mind that there are two types of data, primary and secondary data. There are several methods involved in the collection of primary data, like observation, interview, questionnaires, schedules, etc.

DEFINITION OF QUESTIONNAIRE: We define questionnaire as an instrument for research, which consists of a list of questions, along with the choice of answers, printed or typed in a sequence on a form used for acquiring specific information from the respondents. The questionnaire is prepared in such a way that it translates the required information into a series of questions, that informants can and will answer. Further, it should be such that the respondent gets motivated and encouraged, to make him engaged in the interview and complete it.

The merits of questionnaires are discussed below:

- It is an inexpensive method, regardless of the size of the universe.
- Free from the bias of the interviewer, as the respondents answer the questions in his own words
- Respondents have enough time to think and answer.
- Due its large coverage, respondents living in distant areas can also be reached conveniently.

DEFINITION OF SCHEDULE: The schedule is a preform which contains a list of questions filled by the research workers or enumerators, specially appointed for the purpose of data collection. Enumerators go to the informants with the schedule, and ask them the questions from the set, in the sequence and record the replies in the space provided. There are certain situations, where the schedule is distributed to the respondents, and the enumerators assist them in answering the questions. This method is little expensive as the selection, appointment and training of the enumerators require a huge amount. It is used in case of extensive enquiries conducted by the government agencies, big organisations. Most common example of data collection through schedule is population census.

ISSUES ON FIELD RESEARCH

FIELD RESEARCH:

Field research is defined as a qualitative method of data collection that aims to observe, interact and understand people while they are in a natural environment. For example, nature conservationists observe behaviour of animals in their natural surroundings and the way they react to certain scenarios. In the same way, social scientists conducting field research may conduct interviews or observe people from a distance to understand how they behave in a social environment and how they react to situations around them.

Field research encompasses a diverse range of social research methods including direct observation, limited participation, analysis of documents and other information, informal interviews, surveys etc. Although field research is generally characterized as qualitative research, it often involves multiple aspects of quantitative research in it.

Field research typically begins in a specific setting although the end objective of the study is to observe and analyse the specific behaviour of a subject in that setting. The cause and effect of a certain behaviour, though, is tough to analyse due to presence of multiple variables in a natural environment. Most of the data collection is based not entirely on cause and effect but mostly on correlation. While field research looks for correlation, the small sample size makes it difficult to establish a causal relationship between two or more variables.

Methods of Field Research:

Field research is typically conducted in 5 distinctive methods. They are:

- *Direct Observation:*

In this method, the data is collected via an observational method or subjects in a natural environment. In this method, the behaviour or outcome of situation is not interfered in any way by the researcher. The advantage of direct observation is that it offers contextual data on people, situations, interactions and the surroundings. This method of field research is widely used in a public setting or environment but not in a private environment as it raises an ethical dilemma.

- *Participant Observation:*

In this method of field research, the researcher is deeply involved in the research process, not just purely as an observer, but also as a participant. This method too is conducted in a natural environment but the only difference is the researcher gets involved in the discussions and can mould the direction of the discussions. In this method, researchers live in a comfortable environment with the participants of the research, to make them comfortable and open up to in-depth discussions.

- *Ethnography:*

Ethnography is an expanded observation of social research and social perspective and the cultural values of an entire social setting. In ethnography, entire communities are observed objectively. For example, if a researcher would like to understand how an Amazon tribe lives

their life and operates, he/she may choose to observe them or live amongst them and silently observe their day-to-day behaviour.

- **Qualitative Interviews:**

Qualitative interviews are close-ended questions that are asked directly to the research subjects. The qualitative interviews could be either informal and conversational, semi-structured, standardized and open-ended or a mix of all the above three. This provides a wealth of data to the researcher that they can sort through. This also helps collect relational data. This method of field research can use a mix of one-on-one interviews, focus groups and text analysis.

- **Case Study:**

A case study research is an in-depth analysis of a person, situation or event. This method may look difficult to operate. However, it is one of the simplest ways of conducting research as it involves a deep dive and thorough understanding the data collection methods and inferring the data.

PILOT STUDY BASED ON QUESTIONNAIRE:

The Concise Oxford Thesaurus defines a pilot study as an experimental exploratory, test, preliminary, trial or try out investigation. Pilot test is a trial collection of data to detect weaknesses in design and instrument and provide proxy data for selection of a probability sample. A pilot survey is a mini-survey where the researcher sends out a questionnaire to a smaller sample size compared to the actual target audience. By collecting information from a convenience sample, we can predict the response patterns of participants and make any required changes to our research.

Reasons for Conducting Pilot Study:

The main reasons for conducting a pilot study are:

- **Process:** This assesses the feasibility of the process that are key to the success of the main study
- **Resources:** This deals with assessing time & resource problems that can occur during the main study.
- **Management:** This covers potential human & data management problems.
- **Scientific:** This deals with the assessment of the response, effect & variance of the effect
- **Other Reasons:**
 - Developing & testing adequacy of research instrument
 - Assessing the feasibility of a full scale study /survey
 - Establishing whether the sampling frame & technique are effective collecting preliminary data.
 - Determining what resources are needed for a planned study
 - Assessing the proposed data analysis techniques to uncover potential problems.
 - Developing a research question & research plan.
 - Convincing funding bodies & other stakeholders that the main study is worth supporting.

Advantages of a Pilot Study:

The advantages of a pilot study are:

- It permits preliminary testing of hypothesis that leads to testing more precise hypotheses in the main study. It may lead to changing some hypotheses, dropping some or developing new hypotheses.
- It often provides the researcher with ideas, approaches & clues the researcher may not have foreseen before conducting the pilot study. Such ideas & clues increase the chances of getting clearer findings in the main study.
- It permits a thorough check of the planned statistical & analytical procedures, giving a researcher a chance to evaluate their usefulness to the data. The researcher may then be able to make needed alterations in the data collecting methods & therefore analyze data in the main study more efficiently.
- It can greatly reduce the number of unanticipated problems because the researchers have all opportunity to redesign parts of his/her study to overcome difficulties that the pilot study reveals.
- It may save lot of time & money. The pilot study almost always provides enough data for the researcher to decide whether to go ahead with the main study.
- In the pilot study, the researcher may try out a number of alternative measures & then select those that produce the clearest results for the cleanest results for the main study.
- The less research experience the student has, the more she/he is likely to benefit from a pilot study. Because of that possibility, the student should attempt a pilot study whenever possible.

Problems of Pilot Study:

- Possibility of making inaccurate predictions or assumptions on the basis of pilot data.
- Completing a pilot study successfully is not a guarantee of the success of the full scale survey. Although pilot study findings may offer some indication of the likely size of response rate in the main survey, they cannot guarantee this because they do not have a statistical foundation & are nearly always based on small numbers.
- A further concern is that of contamination. This may arise in two ways:
 - a) Where data from pilot study are included in the main results
 - b) Where pilot study is included in the main study, but new data are collected from these people.
- A more common problem is deciding whether to include pilot study participants in the main study.
- Problems may also arise where a pilot study requires significant investment and resources, making it difficult for the study team or researcher to call a halt to the research after an unsuccessful pilot study.

ETHNOGRAPHIC FIELD DIARY:

Field Diary:

The field diary is the basic document which contains all the data collected. It refers to qualitative notes recorded by researchers in the course of field research, during or after their observation of a specific phenomenon they are studying. The notes are intended to be read as

evidence that gives meaning and aids in the understanding of the phenomenon. Field notes allow the researcher to access the subject and record what they observe in an unobtrusive manner.

Ethnographic Field Note/ Diary:

Ethnographic field note is considered the most important field text collection method in qualitative research, and it is basically a primary method of taking field text for an ethnographic study. In fact, an ethnographic research requires more descriptive and interpretive field text analysis about the researched participants focusing on the cultural aspects in a natural setting. The goal of ethnographic research is thus to formulate a pattern of analysis that makes reasonable sense out of human actions within the given context of specific time and place (Fife, 2005). Thus, an ethnographer applies a different method to address the problem of the research. The best approach to collect empirical field text from the field is by writing field notes. Whether an ethnographer conducts formal interviews, informal interviews, observation, focus group discussions, key informant interviews or overheard conversations, writing the field notes is virtually a significant way for the researcher to record the data (Dewalt & Musante, 2010). If the ethnographers do not write it down in their field notes, recording data may not be possible. Thus, the field note writing is the most important means of documenting field data in an ethnographic research.

In order to record as much as possible, it is important to include as much information as possible in your field notes. Chiseri-Strater and Sunstein (1997) have developed a list of useful things that should be included in all field notes:

- Date, time, and place of observation
- Specific facts, numbers, details of what happens at the site
- Sensory impressions: sights, sounds, textures, smells, taste
- Personal responses to the fact of recording field notes
- Specific words, phrases, summaries of conversations, and insider language
- Questions about people or behaviors at the site for future investigation
- Page numbers to help keep observations in order

There are many other methods by which we can record ethnographic field text. Field notes remain a central method in ethnography even though modern technologies such as cameras and audio recorders may seem to be better at capturing information and easier to use (Madden, 2010). An ethnographer could use modern tools and techniques in writing the field note such as Instagram and Vivo. Many would say that typing notes directly into a laptop is now equivalent to handwriting, and they are probably correct (Madden, 2010).

In the 21st century, researchers have been using many gadgets in the research. To be skilful in ethnographic field notes writing using pen and pencil is still significant for the ethnographers. The ethnographers need to see the context of the field, ethical aspect and technical part of the successful field text collection. The aim of the field work is to produce comprehensive field texts that help to produce a reliable thesis. On the other hand, the development countries are also importing modern technology due to the revolution in digital world. As a result, the research participants in the developing countries are also aware of the emerging technology. In light of the problems associated with writing field notes, particularly in the context of interviews, the advantages of audio-recording, and perhaps even video-recording, are obvious (Hamersley & Atkinson, 2008). Despite the revolution in the digital technology there are both challenges and opportunities to use them in the research field. Due to the poor knowledge and skill on the use of modern technology the hand written field note method is still significant in research.

LONGITUDINAL STUDY & CASE STUDY RESEARCH:

❖ *LONGITUDINAL STUDY:*

A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. As longitudinal studies are observational, there will be no interference with the respondents or subjects if it happens to be a survey. They are unique from other types of research because of their timeline. This means that the same subjects are observed multiple times (often in the course of many years), instead of the researchers trying to collect data from various subjects with the aim to study the same variables. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Types of Longitudinal Research:

There are three major types of longitudinal studies:

- **Panel study:** Involves sampling a cross-section of individuals.
- **Cohort study:** Involves selecting a group based on a specific event such as birth, geographic location, or historical experience.
- **Retrospective study:** Involves looking to the past by looking at historical information such as medical records.

Advantages of Longitudinal Studies:

- One key advantage of performing longitudinal studies is their **ability to show patterns of a variable over time**, which is a very powerful way through which researchers come to learn about the relationships of cause and effect.
- With a **clear focus**, longitudinal studies would see how a particular end state or a set of circumstances would come to be. And though people usually might not remember past events, it can be solved by means of actual recording, thus ensuring a high level of **validity**.

- A longitudinal study is unique in itself in terms of its ability to **provide useful data** about individual changes.
- As most longitudinal studies use the observation method (they observe the state of the world without manipulating it), it has been argued that they may have less power in detecting causal relationships than experiments. However, because of the repeated observations they use at individual levels, they have **more power than cross-sectional observational studies** in terms of being able to exclude time-invariant, unobserved individual differences and in terms of observing a certain event's temporal order.
- A longitudinal study is often used in studying **developmental trends** across life spans and in studying life events throughout generations or lifetimes. This is primarily because, unlike a cross-sectional study, in which different individuals with same characteristics are compared, a longitudinal study would track the same people, thus the differences observed in the group will be less likely to be the result of a cultural difference across generations.
- Because they are perfect for doing research on developmental trends, longitudinal studies can make **observation of changes** more accurate, making them a more preferred method in various fields.
- Longitudinal studies allow for **flexibility** to occur, which means their focus can be shifted while data is being collected.

Disadvantages of Longitudinal Studies:

- One of the biggest drawbacks of performing longitudinal studies is **panel attrition**. If you are only depending on the same group of subjects for a study that takes place once in a while for years, some of these subjects will obviously no longer be able to participate due to various reasons, such as refusal, changes in contact information and death, which cuts down useable data that can be drawn for an ultimate conclusion.
- Another huge drawback to any longitudinal study is the great amount of time it needs to collect all the data that is needed. Usually, it **takes a long period of time** to gather results before you can start making patterns.
- They would gather **data that is not that reliable**. While longitudinal data is collected at multiple points, these observation periods are pre-determined and cannot be taken into account no matter what happens between these points. Aside from this, there is also the idea of panel conditioning, where respondents can often unknowingly change their qualitative responses over time to better fit what they consider to be the intended goal of the observer. The process of longitudinal studies itself has changed how subjects or respondents view the questions used.
- They **require a large sample size**. It means that such studies should have a large number of subjects who are willing to cooperate.
- It is known that **cross-sectional studies are more affordable compared to longitudinal studies**. With fewer touch points, the former are also much quicker in reaching an observational conclusion. Considering they use a carefully chosen sample size, they can be more helpful in representing entire populations, instead of using subsets, which can be very beneficial when it comes to considering a policy change.

❖ CASE STUDY RESEARCH:

A case study is an effective research method that specifically studies a single case over a period of time. Case studies are research methodologies that are used and analysed in order to depict principles.

Case studies seek to explain and give details in the analysis of people and events. Writing a case study is a very useful form of study in the educational process.

Characteristics of Case Study Research:

Particularistic Phenomenon: A case study researcher may specifically choose a particular instance of phenomenon under investigation to understand a specific problem that occurs in everyday practice.

Descriptive Phenomenon: Descriptive phenomenon means that the end result of the case study, the narrative, includes ‘thick description’ of the phenomenon, including many variables and analyses of the interactions.

Heuristic Phenomenon: Heuristic refers to the fact that case studies ‘illuminate the readers’ understanding of the phenomenon under study’ beyond the readers’ original knowledge.

Types of Case Study:

There are 4 types of case studies used for different purposes. The main purpose of case studies is to analyse problems within the boundaries of a specific organization, environment, or situation. According to design, case studies can be divided into the following categories:

- **Illustrative Case Study:** An illustrative case study is used to examine a familiar case in order to help others to understand it. It is one of the main types of case studies in research methodology and is primarily descriptive. In this type of case study, usually, one or two instances are utilized to explain what a situation is like.
- **Exploratory Case Study:** An exploratory case study is a primary project conducted before a large scale investigation. These types of case studies are very popular in the social sciences and primarily focus on real-life contexts and situations. Typically, these are used to identify research questions and methods for a large and complex study. The main purpose of an exploratory case study is to help identify situations for the further research process.
- **Cumulative Case Study:** A cumulative case study is one of the main types of case studies in qualitative research. It is used to collect information from different sources at different times. The aim of this case study is to summarize the past studies without spending additional cost and time on new investigations.
- **Critical Instance Case Study:** Critical instances case studies are used to determine the cause and consequence of an event. The main reason for this type of case study is to investigate one or more sources with unique interest and sometimes with no interest in general. A critical case study can also be used to question a universal assertion.

Types of Subjects of Case Study:

In general, there are four types of case studies and 5 types of subjects they address. Every case study whether exploratory, critical, or cumulative, fits into the following subject categories.

- **Person:** This type of study focuses on one subject or individual and can use several research methods to determine the outcome.
- **Group:** This type of study takes into account a group of individuals. This could be a group of friends, coworkers, or family.

- **Location:** The main focus of this type of study is the place. It also takes into account how and why people use the place.
- **Organization:** This study focuses on an organization or company. This could also include the company employees or people who work in an event at the organization.
- **Event:** This type of study focuses on a specific event. It could be societal or cultural and examines how it affects the surroundings.

Pros & Cons:

There are several pros that back case studies and there are cons too that criticize them. The pros and cons are listed below.

▪ **Pros:**

- They show client observations-Since case studies are strategies that are used and analyzed in order to describe principles therefore it seeks show indeed the client investigated and experienced a particular phenomenon.
- Makes practical Improvements-Case studies present facts that categorically describe particular people or events in order to make some of the necessary improvements. Case studies data is what supports a particular belief.
- They are an influential way of portraying something-If a researcher wants to prove a particular principle to be true, he or she must back it by case studies in order to make the other people and the naysayers believe.
- They turn opinions into Facts-Case studies present real data on a particular phenomenon. Since, facts about various things are presented then it can be verified through this kind of data if the information presented is in the positive or negative development of opinion.
- It is relevant to all the parties that are Involved-Case studies help the researchers in actively focusing on the data collection process and the participants' knowledge is bettered. At the end of the process, everybody is able to defend his position through facts.
- A number of different research methodologies can be used in case the Studies-Case study method goes beyond the interview and direct observations. Secondary data can be obtained from various historical sources that can be used to back the method.
- Case studies can be done Remotely-It is not essential for a researcher to be present in the specific location of the study in order to effectively use the case study method. Other forms of communication come in to cover that gap for the researcher.
- 8. It has a very high cost-If you put this research method in comparison to the others, this one seems more expensive because the cost of accessing data is very high.
- 9. Readers can access data from this method very easily-The format in which case studies present their data is very useful to the readers and easily note the outcomes of the same.
- 10. Collects data that cannot be collected by another method- The type of data collected by case studies is much richer and greater in-depth than that of the other experimental methods.

▪ **Cons:**

- Data collected cannot be generalized- The data collected by the case study method was collected from a smaller population it cannot be generalized to the wider population.
- Some of the case studies are not the scientific-The weakness of the data collected in some of the case studies that are not scientific is that it cannot be generalized.
- It is very difficult to draw a definite cause/effect from case studies-The the kind of data that case studies present cannot be used to draw a definite cause-effect relationship.
- Case studies concentrate on one experiment-The problem associated with concentrating on one experiment or a specific group of people is that the data presented might contain some kind of bias.
- It takes a lot of time to analyze the data-This process takes longer to analyze the data because there is a very large amount of data that must be collected. Participants might take a lot of time in giving answers or giving inaccurate information.
- Case studies can be inefficient Processes-Sometimes the researchers are not present at the study areas, which means they will not be able to notice whether the information provided is accurate or not terming the whole process inefficient.
- Case study method can only be effective with a small sample size-If a very large sample size is involved in the case study it is likely for it to become inefficient because the method requires a small sample size to get the data and analyze it.
- The method requires a lot of labor in data collection-The researcher is seriously needed in the data collection of this method. They have to be personally involved in order to be able to identify the quality of the data provided.
- There are factors that can influence the data- The method of data collection is meant to collect fact-based data but the power to determine what fact is and what is not is the person who is collecting the data.
- There is no right answer in case Studies-Case studies do not present any specific answer that is right, the problem arises in the validation of solutions because there is more than one way of looking at things.

FIELD TECHNIQUES: PARTICIPATORY RURAL APPRAISAL AND FOCUS GROUP DISCUSSION

Participatory rural appraisal:

Participatory rural appraisal (PRA) is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes.

Key Principles

- **Participation:** Local people serve as partners in data collection and analysis.
- **Flexibility:** Not a standardized methodology, depends on purpose, resources, skill, time.
- **Teamwork:** Outsiders and insiders, men and women, mix of disciplines.
- **Optimal Ignorance:** Cost and time efficient, but ample opportunity for analysis and planning.

- Systematic: For validity and reliability, partly stratified sampling, cross-checking.
- Example: Participatory rural appraisals using various PRA tools and techniques are conducted to obtain information on the topography of the land, soil structure, water resource utilisation, seasonal crops, rainfall and cropping patterns, preference for trees and history of the area. The PRAs facilitate rapport building with the community and the entire community decides on common objectives

Importance of Participatory Rural Appraisal

As PRA, basically came into existence in response to the disappointments and the criticism of the assumptions upon which earlier development work of planning and implementation was based, PRA has the added advantage of participation of local people which positively affects the planning, documentation and implementation of a programme.

Following are some of the **advantages** of PRA which makes it important for a programme.

1. Target group's real priorities are identified

In PRA, the target group i.e. local people are asked about the immediate problems, that they are facing. The outsiders do not impose their own solutions on these problems; rather they explore the solutions with the local people in which they are really interested.

2. Delegation of responsibilities

PRA encourages self-reliant development with most of the responsibilities to manage and execute the developmental activities done by local people. This creates a sense of ownership and enthusiasm among the local people and thus the efficiency to achieve the goal also increases.

3. Motivation of local development workers

The local development workers of non-governmental organizations, government or other agencies, who are involved in the developmental projects or programmes, get motivated through their participation in PRA activities, by knowing the grass-root level problems and priorities of the people. PRA helps to ensure better understanding and commitment of local workers; in return people at administrative and organizational levels also become aware about the requirements and priorities of workers and community.

4. Use of local resources

PRA encourages participation of the local people and they design the activities by keeping in mind the availability of the resources that are present in their surroundings. This makes complete use of existing local resources like manpower, time, material resources and others.

5. Sustainable developmental activities

As local people plan and execute the activities themselves and which are technically, environmentally, socially and financially appropriate to local conditions, which lead to more sustainable developmental activities.

6. Brings desirable behavioural changes

PRA methods encourage participation by providing visual basis like resource map,

which stimulates the thought process and encourages local people to offer their views which are appreciated and included in the activities, increasing their confidence to participate more.

7. Use of indigenous knowledge

Every community has an indigenous knowledge system which it acquires through work experience and solves problems in its own specific situations. This knowledge is shared by the local people of community while participation.

FOCUS GROUP DISCUSSION

A focus group discussion (FGD) is a good way to gather together people from similar backgrounds or experiences to discuss a specific topic of interest. The group of participants is guided by a moderator (or group facilitator) who introduces topics for discussion and helps the group to participate in a lively and natural discussion amongst themselves. The strength of FGD relies on allowing the participants to agree or disagree with each other so that it provides an insight into how a group thinks about an issue, about the range of opinion and ideas, and the inconsistencies and variation that exists in a particular community in terms of beliefs and their experiences and practices. FGDs can be used to explore the meanings of survey findings that cannot be explained statistically, the range of opinions/views on a topic of interest and to collect a wide variety of local terms. In bridging research and policy, FGD can be useful in providing an insight into different opinions among different parties involved in the change process, thus enabling the process to be managed more smoothly. It is also a good method to employ prior to designing questionnaires.

- You use a focus group in qualitative research. A group of 6-10 people, usually 8, meet to explore and discuss a topic, such as a new product. The group shares their feedback, opinions, knowledge, and insights about the topic at hand.
- Participants openly share opinions and are free to convince other participants of their ideas.
- The mediator takes notes on the discussion and opinions of group members.
- The right group members affect the results of your research, so it's vital to be picky when selecting members.

Focus groups possess a distinct advantage over other market research methods. They capitalize on the moderator's communication with participants and the flexibility to move the discussion. It allows you to extract meaningful insights and opinions. The purpose of the group is not to arrive at a consensus or agreement on the topic. Instead, it seeks to identify and understand customer perceptions of a brand, product, or service.

Best practices for focus group research:

Follow these five steps to create a market research focus group.

1. Have a clear plan for focus group members. The goal of the group must be clear before approaching participants to join. For example, does the researcher intend to discuss new products or the effect of current marketing campaigns? Use a written explanation to clarify the objective to members.
2. With a plan in place, begin writing your focus group survey questions. Questions should align with the research objective and complement one another. Start the discussion with the

most crucial issues and end with the least important. Asking open-ended questions increases the effectiveness of your research.

3. Schedule the time, place, and duration of the discussion. Be sure to let members know in advance so that they can plan accordingly.
4. You can host a focus group in person or through an online community. Offline groups meet at a physical location to conduct the discussion in person. An in-person event requires a venue that includes bathrooms and refreshments, so participants are comfortable. On the other hand, online focus groups meet virtually through an online discussion platform. Invitations and reminders for online discussions need to be sent out several times before the event. This helps participants to remember your online event.
5. Create informational brochures or forum posts with a welcome note, the meeting agenda, and overall rules of the discussion.

Main pillars of a focus group:

Participants: A crucial step in conducting a focus group is the process of participant selection. The main criteria for selecting the participants must be their knowledge about the subject. If you need help selecting members, look for a research-based organization that matches you with qualified participants.

The role of a moderator: The moderator conducts the group with confidence and leads members through the questions. They must be impartial throughout the process. As the researcher, you can also be the moderator, so long as you remain objective. You can also hire a s

Steps to conduct focus group research

1. Recruit the right participants

A researcher must be careful while recruiting participants. Members need adequate knowledge of the topic so that they can add to the conversation.

2. Choose a moderator

Your moderator should understand the topic of discussion and possess the following qualities:

- Ensures participation from all members of the group.
 - Regulates dominant group members so others may speak.
 - Motivates inattentive members through supportive words and positive body language.
 - Makes the executive decision to end or continue a discussion should it become too heated.
- Verify your moderator doesn't know any of the participants. Existing relationships between a member and moderator cause bias and can skew your data.

3. Record the meeting for future purposes

While conducting a focus group, it is essential to record the sessions or meetings. A researcher can record the discussion through audio or video. You must let participants know you're planning to record the event and get their consent.

4. Write clear discussion guidelines

Before the session starts, it is crucial to write down clear session guidelines. Include key questions, expectations of focus group members, whether you're recording the discussion, and methods of sharing results. Give out the instructions in advance and request participants to comply with them.

5. Conduct the session and generate a report

Once participants understand their role, the moderator leads the focus group survey. You can ask members to fill out a feedback form to collect quantitative data from the event. Use your data and generate reports on the overall findings of your study.

6. Use the data to make a plan of action

Share your report with stakeholders and decision makers in your organization. A good report helps you design actionable plans to improve products or services according to the focus group feedback. Update focus group members on the changes you make and the results of those changes.

Focus group examples

Focus groups are common in three situations:

- Initial stages of a research study
- While creating a plan of action during research
- After the completion of the study to establish results

For example, a laptop company needs customer feedback about an upcoming product. Focus group research provides direct information about the market from actual consumers.

The company chooses eight individuals who represent their target market for a constructive discussion. The moderator asks questions regarding customer preference on laptop size and features. Group members discuss why they do or do not like certain aspects of a laptop. The company uses the opinions of the participants to create a product that fits customer needs and wants.

METHODS OF REPORT WRITING

A report is a document that presents the results of an investigation, project or initiative. It can also be an in-depth analysis of a particular issue or data set. The purpose of a report is to inform, educate and present options and recommendations for future action. Reports are an integral element of dozens of industries, including science, healthcare, criminal justice, business and academia. Reports typically consist of several key elements, including—

1. detailed summaries of activities
2. analysis of the impact of the event
3. evaluations of the facts and data
4. predictions for what may happen as a result of an event

5.recommendation for next course of action

6.conclusion

Ethnographic field note -----

ethnographic fieldwork is how anthropologists gather data. Fieldwork is the process of immersing oneself in as many aspects of the daily cultural lives of people as possible in order to study their behaviours and interactions. ethnography is most useful in the early stages of a user-centred design project. This is because ethnography focuses on developing an understanding of the design problem. therefore, it makes more sense to conduct ethnographic studies at the beginning of a project in order to support future design decisions. Common ethnographic data collection methods are----

1.participant observation: participant observation is the quintessential fieldwork method in anthropology. Anthropologists use various degrees of participant observation, from full participation in ongoing activities to passive observation within the locations of interest. Participant observation is useful at multiple stages of an evaluation.

- a. initially to identify issues that need to be explored with other data collection methods.
- b. ongoing as process evaluation.
- c. following other types of data collection, to triangulate earlier findings and directly observe the specific phenomena that participants have spoken about.

2. Focus Groups: The focus group is a group interview method useful to obtaining information on relatively unstudied topics for which the full range of relevant domains is not known and the dynamic interaction among participants is of interest. Researchers chose focus groups over individual in-depth interviews when data acquisition will benefit from the dynamic that is created through group discussion. The discussion often elicits information and insights that might not be gained from an individual interview, including the colloquial ways in which participants speak with one another about working in or seeking care from the practice.

3.Audiovideo recordings: audio/ video is an observation-recording tool that can be employed by researchers to record, review and analyse user behaviour or actions in specific scenarios. Audio/ video can be easily combined with other design research methods such as interviews, guided tour, task analysis, to record user experience or interaction with a prototype, a digital or non-digital product and services.

4.participatory rural appraisal: it is an approach used by non-governmental organizations and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes. The philosophical roots of PRA techniques can be traced to activist adult education methods. The principle of PRA----

- a. local people serve as partners in data collection and analysis.
- b. Not a standardized methodology, depends on purpose, resources, skill, time.

- C. outsiders and insiders, men and women, mix of disciplines.
- d. cost and time efficient, but ample opportunity for analysis and planning.
- e. For validity and reliability, party stratified sampling, cross-checking.

The PRAS facilitate rapport building with the community and the entire community decides on common objectives.

APPLICATIONS OF QUALITATIVE RESEARCH TECHNIQUES

STAKEHOLDER ANALYSIS --A **stakeholder analysis** is a process of identifying these people before the project begins; grouping them according to their levels of participation, interest, and influence in the project; and determining how best to involve and communicate each of these stakeholder groups throughout.

PURPOSE OF STAKEHOLDER ANALYSIS

Project managers, program managers, and product managers alike may conduct a stakeholder analysis for several strategic reasons, including:

1. To enlist the help of key organizational players.

By approaching company influencers, executives, or valuable stakeholders for help early in your project, you can leverage the knowledge and wisdom of these key players to help guide the project to a successful outcome. Enlisting these players early on will also increase the chances you will earn their support for your project. But before you can determine which influencers and other key stakeholders to approach, you'll need to conduct a stakeholder analysis.

2. To gain early alignment among all stakeholders on goals and plans.

Because your stakeholder analysis will help you determine which people to involve in the project, you will then be able to bring these people together for a kick-off and early-stage meetings to communicate the project's strategic objectives and plans. Over time, a stakeholder analysis will help ensure everyone starts the project with a clear understanding of what success will look like and how they can contribute to that successful outcome.

3. To help address conflicts or issues early on.

Without a stakeholder analysis, you and your team could be well into a company project before you realize a key person in your organization—perhaps an executive—does not see the value of your initiative, or would prefer to redeploy some of your resources to other projects. Such a person might actively work to thwart or derail your project.

If you had conducted a stakeholder analysis before you began, you would have likely identified this executive as potentially important to your project's success. You could have

then presented your plan to the executive, listened to their objections, and worked to earn their approval to proceed.

Watch this video for an in-depth explanation of stakeholder analysis and to learn how to efficiently conduct a stakeholder analysis.

IMPORTANCE OF CONDUCTING STAKEHOLDER ANALYSIS

Conducting a stakeholder analysis can be strategically valuable when kicking off any type of complex company undertaking. The more stakeholders you can identify early on and the more you can tailor your communication to win approval and support from various stakeholders, the more likely your project is to succeed.

But if you consider how much of an organization is either involved in or affected by the development of a product—engineering, design, procurement, sales, marketing, product, finance, accounting, customer success, etc.—you can understand why stakeholder analysis is an essential exercise for a product manager.

After all, the way you manage the many stakeholders across your company whose jobs your product could impact—starting with identifying them through a stakeholder analysis—could mean the difference between these stakeholders enthusiastically helping your product’s development or trying to block its progress.

STEPS OF CONDUCTING STAKEHOLDER ANALYSIS

Stakeholder analysis exercises will vary by company, industry, and the teams conducting them (e.g., project management vs. product management). But there are useful steps common to most of these types of analyses. Here’s how many organizations conduct a stakeholder analysis.

Step 1: Determine who your stakeholders are.

Start by brainstorming with your team a list of all possible stakeholders for your project. Of course, you can reduce this list later, but you don’t want to miss a potentially pivotal stakeholder at this early stage.

The list of potential stakeholders could include:

- Executive staff
- Marketing
- Sales
- Finance
- Product
- Development/engineering/manufacturing
- Procurement
- The heads of all affected business units
- Consultants

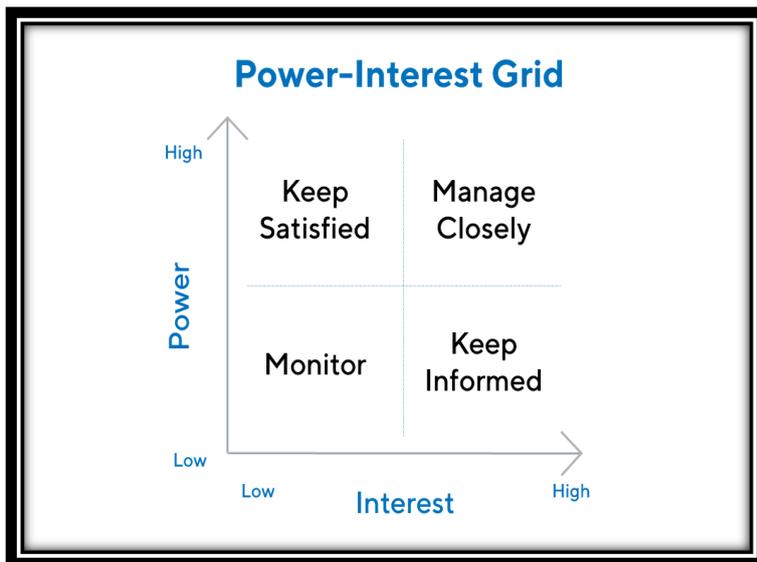
- Operations/IT

Step 2: Group and prioritize these stakeholders.

After you've completed your brainstorming session above and determined which people and teams will indeed be stakeholders, you should start categorizing them in terms of their influence, interest, and levels of participation in your project.

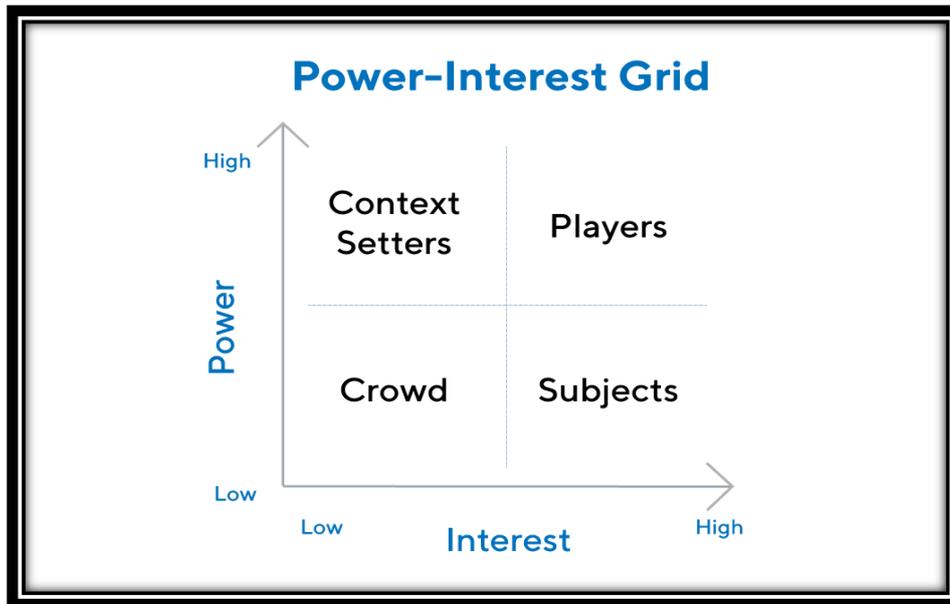
One example of how to do this is by using the power/interest grid.

As you can see, you will group stakeholders into four categories:



1. **High power, high interest:** These are your most important stakeholders, and you should prioritize keeping them happy with your project's progress.
2. **High power, low interest:** Because of their influence in the company, you should work to keep these people satisfied. But because they haven't shown a deep interest in your project, you could turn them off if you over-communicate with them.
3. **Low power, high interest:** You'll want to keep these people informed and check in with them regularly to make sure they are not experiencing problems on the project.
4. **Low power, low interest:** Just keep these people informed periodically, but don't overdo it.

Another approach, popularized in the book *Making Strategy: Mapping Out Strategic Success*, groups stakeholders into four different but similar categories.



1. **Players:** These are the high-power, high-interest individuals with whom you will want to collaborate and keep fully engaged.
2. **Subjects:** These are the low-power, high-interest stakeholders who can offer great insights and ideas for the project but whom you don't need to always say yes to.
3. **Context-setters:** These high-power, low-interest stakeholders (heads of departments, for example) can have a lot of influence over the project but don't want to be involved in the details. Keep them up to date.
4. **Crowd:** Finally, the low-power, low-interest stakeholders are called the crowd. These individuals will require some ongoing communication about the project's progress but probably the least of all stakeholders.

Step 3: Figure out how to communicate with and win buy-in from each type of stakeholder.

Once you've built your list detailing which stakeholders fall into which category, it's time to think strategically about how best to earn the ongoing support of each of these stakeholder types. First, you will want to ask yourself questions about your stakeholders such as:

- What motivates this stakeholder?
- What other priorities do they have, and how can we align our project with those priorities (or at least ensure the project won't threaten them)?
- Will this stakeholder likely have a positive view of our project? If not, what can we do about it?

After you've built out these profiles of each stakeholder type, you're ready to begin the next phase of the stakeholder management process—developing your stakeholder communication plan.

SWOT ANALYSIS

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription.

FEATURES:

- SWOT analysis is a strategic planning technique that provides assessment tools.
- Identifying core strengths, weaknesses, opportunities, and threats leads to fact-based analysis, fresh perspectives, and new ideas.
- SWOT analysis works best when diverse groups or voices within an organization are free to provide realistic data points rather than prescribed messaging.

SWOT Analysis

SWOT analysis is a technique for assessing the performance, competition, risk, and potential of a business, as well as part of a business such as a product line or division, an industry, or other entity.

Using internal and external data, the technique can guide businesses toward strategies more likely to be successful, and away from those in which they have been, or are likely to be, less successful. Independent SWOT analysts, investors, or competitors can also guide them on whether a company, product line, or industry might be strong or weak and why.

Strengths

Strengths describe what an organization excels at and what separates it from the competition: a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favourable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and market share.

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labour supply, and so on.

SWOT Table

Strengths <ol style="list-style-type: none">1. What is our competitive advantage?2. What resources do we have?3. What products are performing well?	Weaknesses <ol style="list-style-type: none">1. Where can we improve?2. What products are underperforming?3. Where are we lacking resources?
Threats <ol style="list-style-type: none">1. What new regulations threaten operations?2. What do our competitors do well?3. What consumer trends threaten business?	Opportunities <ol style="list-style-type: none">1. What technology can we use to improve operations?2. Can we expand our core operations?3. What new market segments can we explore?

METHODS

Internal

What occurs within the company serves as a great source of information for the strengths and weaknesses categories of the SWOT analysis. Examples of internal factors include financial and human resources, tangible and intangible (brand name) assets, and operational efficiencies.

Potential questions to list internal factors are:

- (Strength) What are we doing well?
- (Strength) What is our strongest asset?
- (Weakness) What are our detractors?
- (Weakness) What are our lowest-performing product lines?

External

What happens outside of the company is equally as important to the success of a company as internal factors. External influences, such as monetary policies, market changes, and access to suppliers, are categories to pull from to create a list of opportunities and weaknesses.¹

Potential questions to list external factors are:

- (Opportunity) What trends are evident in the marketplace?
- (Opportunity) What demographics are we not targeting?
- (Threat) How many competitors exist, and what is their market share?
- (Threat) Are there new regulations that potentially could harm our operations or products?

Use a SWOT analysis to identify challenges affecting your business and opportunities that can enhance it. However, note that it is one of many techniques, not a prescription.

SWOT Analysis Example

In 2015, a Value Line SWOT analysis of The Coca-Cola Company noted strengths such as its globally famous brand name, vast distribution network, and opportunities in emerging markets. However, it also noted weaknesses and threats such as foreign currency fluctuations, growing public interest in "healthy" beverages, and competition from healthy beverage providers.²

Its SWOT analysis prompted Value Line to pose some tough questions about Coca-Cola's strategy, but also to note that the company "will probably remain a top-tier beverage provider" that offered conservative investors "a reliable source of income and a bit of capital gains exposure."

Five years later, the Value Line SWOT analysis proved effective as Coca-Cola remains the 6th strongest brand in the world (as it was then). Coca-Cola's shares (traded under ticker symbol KO) have increased in value by over 60% during the five years after the analysis was completed.

To get a better picture of a SWOT analysis, consider the example of a fictitious organic smooth company. To better understand how it competes within the smoothie market and what it can do better, it conducted a SWOT analysis. Through this analysis, it identified that its strengths were good sourcing of ingredients, personalized customer service, and a strong relationship with suppliers. Peering within its operations, it identified a few areas of weakness: little product diversification, high turnover rates, and outdated equipment.

Examining how the external environment affects its business, it identified opportunities in emerging technology, untapped demographics, and a culture shift towards healthy living. It also found threats, such as a winter freeze damaging crops, a global pandemic, and kinks in the supply chain. In conjunction with other planning techniques, the company used the SWOT analysis to leverage its strengths and external opportunities to eliminate threats and strengthen areas where it is weak.

POPULATION COMPOSITION----- Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

The age-structure----- The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

The Sex Ratio -----The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males.

The Population Pyramid -----Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

POPULATION COMPOSITION AND AGE-SEX PYRAMID

1.put the data on excel sheet

	A	B	C	D	
1	Age Group	Male	Female	Total	%
2	00-04	3743862	3589281	7333143	
3	05-09	4216763	4031046	8247809	
4	10-14	4677506	4479017	9156523	
5	15-19	4702325	4355706	9058031	
6	20-24	4422630	4335692	8758322	
7	25-29	4044904	3953005	7997909	
8	30-34	3464659	3376931	6841590	
9	35-39	3523361	3489285	7012646	
10	40-44	3219604	2933456	6153060	
11	45-49	2814212	2521507	5335719	
12	50-54	2317232	1940648	4257880	
13	55-59	1746903	1521747	3268650	
14	60-64	1406401	1339053	2745454	
15	65-69	991280	991713	1982993	
16	70-74	686881	703726	1390607	
17	75-79	360216	379551	739767	
18	80+	406536	477025	445803	
19	Total	46745275	44418389	90725906	
20					

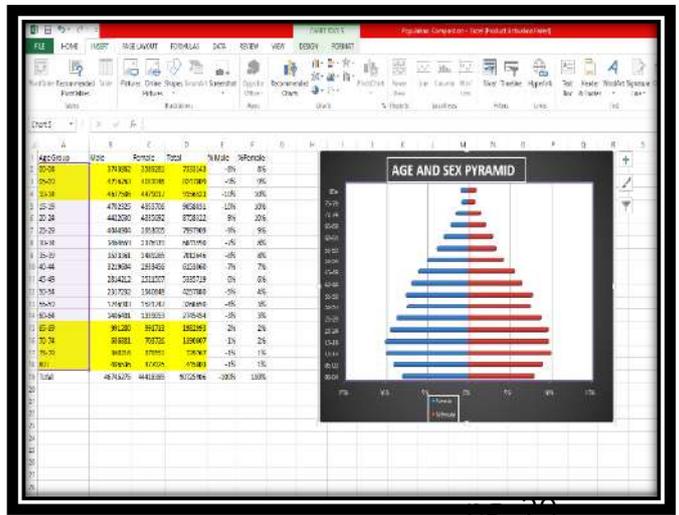
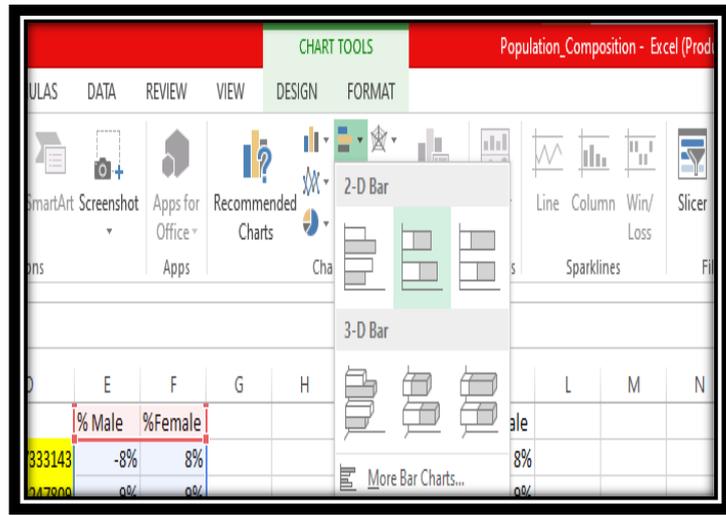
H	I	J	K	L	M
		%male	%female		
		-8%	8%		
		-9%	9%		
		-10%	10%		
		-10%	10%		
		-9%	10%		
		-9%	9%		
		-7%	8%		
		-8%	8%		
		-7%	7%		
		-6%	6%		
		-5%	4%		
		-4%	3%		
		-3%	3%		
		-2%	2%		
		-1%	2%		
		-1%	1%		
		-1%	1%		
		-100%	100%		

2. Calculate the % of the male and female population from the data.

3. After Calculating the % of the male and female population from the data select the age group with both male and female % population.

Age Group	Male	Female	Total	% Male	%Female	%male	%female
00-04	3743862	3589281	7333143	-8%	8%	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%	-3%	3%
65-69	991280	991713	1982993	-2%	2%	-2%	2%
70-74	686881	703726	1390607	-1%	2%	-1%	2%
75-79	360216	379551	739767	-1%	1%	-1%	1%
80+	406536	477025	445803	-1%	1%	-1%	1%
Total	46745275	44418389	90725906	-100%	100%	-100%	100%

4. Go to insert select a suitable bar

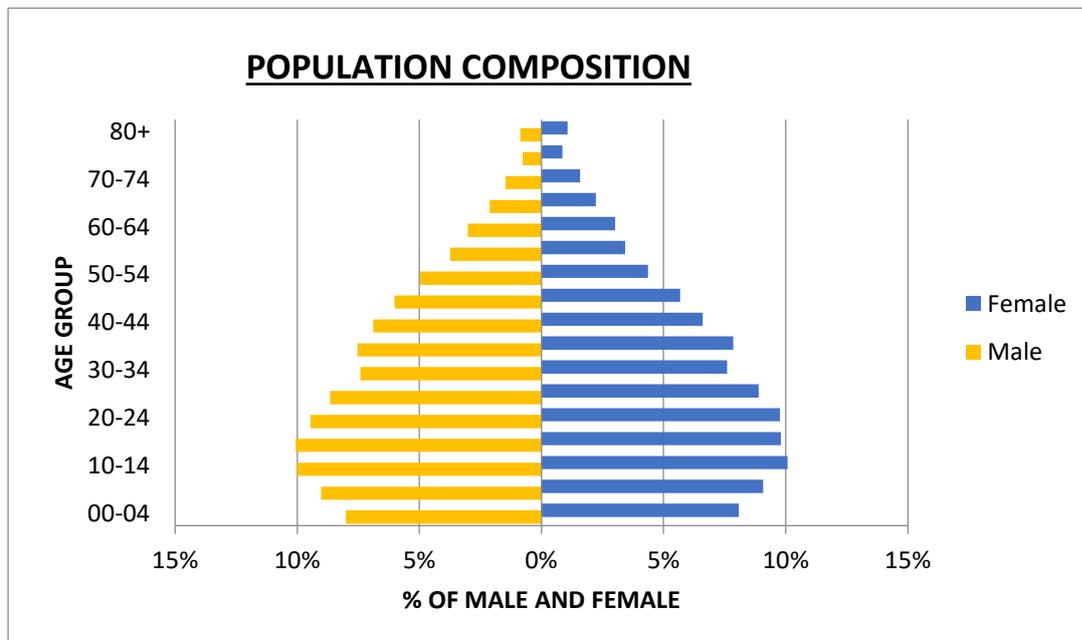
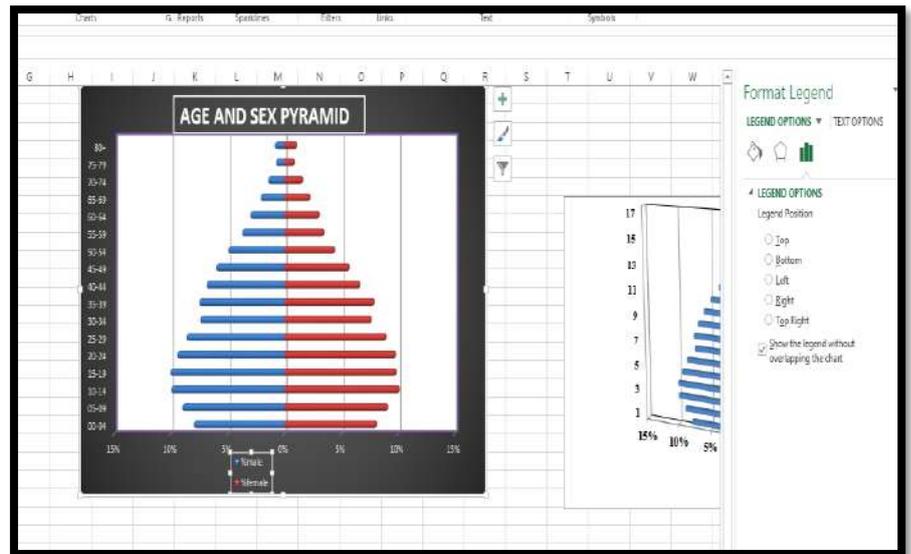




5. after your age and sex pyramid was appear you have to remove the (-) portion from the horizontal plane > right click on it > format axis

6. than this type of tool box was open > go to number > click on customs

7. Add title, legend etc. by using format legend tool bar



INTERPRETATION:

The above diagram shows the population pyramid which display age group that are represented using horizontal bar. On the vertical axis we have plotted age group. And on the horizontal axis we have plotted percentage of male and female population.

Thus from the above diagram we can interpret that ratio between male and female is almost same. The age group between 10-24 has the highest population. The age group between 70-80 (dependent population) having lowest population. The child dependent population has larger population than the older dependent population. Thus the population increases from the age group 10 to 24 and then it can decreases

Dependency Ratio The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0-14 and 65+) and those typically in the labour force (the productive part ages 15-64). It is used to measure the pressure on the productive population.

FORMULAE:

In published international statistics, the dependent part usually includes those under the age 15 and over the age of 64. The productive part makes up the population in the between ages 15-64. It is normally expressed as a percentage:

$$(Total) \text{ Dependency ratio: } \frac{(no. \text{ of people aged } 0-14) + (no. \text{ of people aged } 65 \text{ and over}) * 100}{no. \text{ of people aged } 15-64}$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. This results in direct impacts on financial expenditures on things like social security, as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and the aged dependency ratio.

$$Child \text{ dependency ratio} = no. \text{ of people aged } 0-14 / no. \text{ of people aged } 15-64 * 100$$

$$Aged \text{ dependency ratio} = no. \text{ of people aged } 65 \text{ and over} / no. \text{ of people } 15-64 * 100$$

TABLE SHOWING % OF AGED AND CHILD DEPENDENT POPULATION

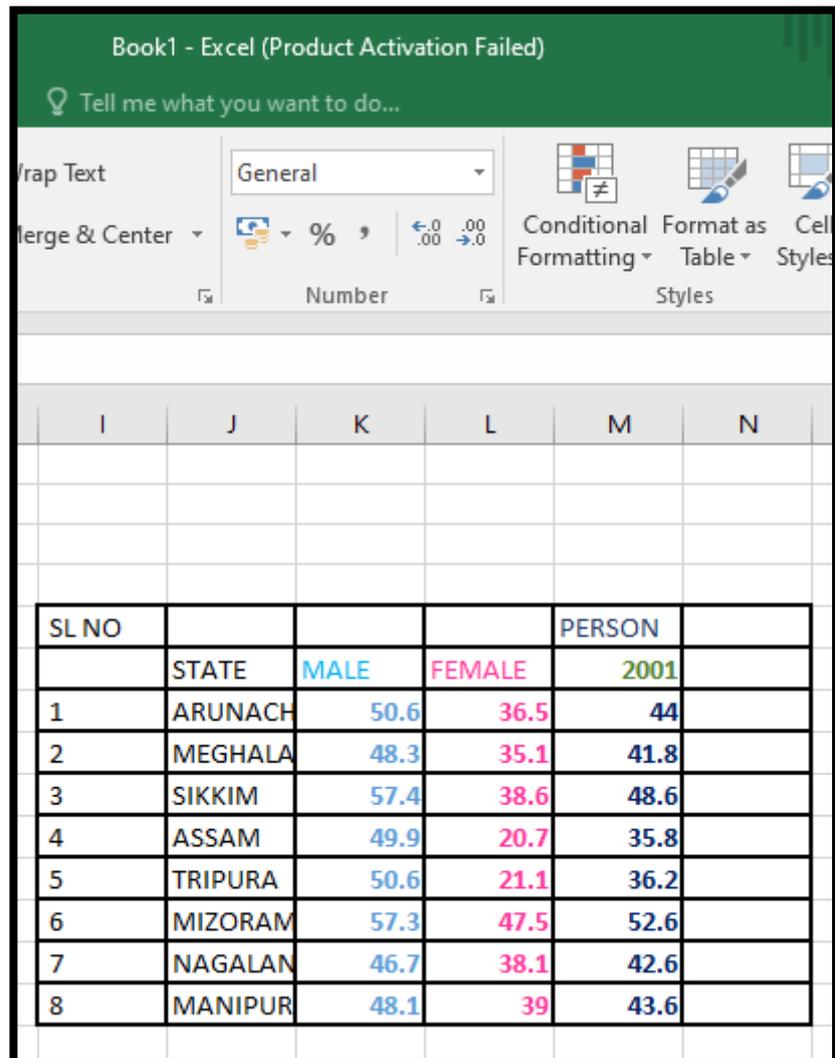
Age Group	Male	Female	Total		
00-04	37,43,862	35,89,281	7333143		
05-09	42,16,763	40,31,046	8247809	24737475	
10-14	46,77,506	44,79,017	9156523		
15-19	47,02,325	43,55,706	9058031		40.26986
20-24	44,22,630	43,35,692	8758322		
25-29	40,44,904	39,53,005	7997909		
30-34	34,64,659	33,76,931	6841590		
35-39	35,23,361	34,89,285	7012646	61429261	
40-44	32,19,604	29,33,456	6153060		
45-49	28,14,212	25,21,507	5335719		
50-54	23,17,232	19,40,648	4257880		47.69168
55-59	17,46,903	15,21,747	3268650		
60-64	14,06,401	13,39,053	2745454		
65-69	9,91,280	9,91,713	1982993		
70-74	6,86,881	7,03,726	1390607		7.421821
75-79	3,60,216	3,79,551	739767	4559170	
80+	4,06,536	4,77,025	445803		
Total	4,67,45,275	4,44,18,389	90725906		

CALCULATION HAS BEEN DONE WITH THE HELP OF THE FORMULAES i.e. was mentioned above.

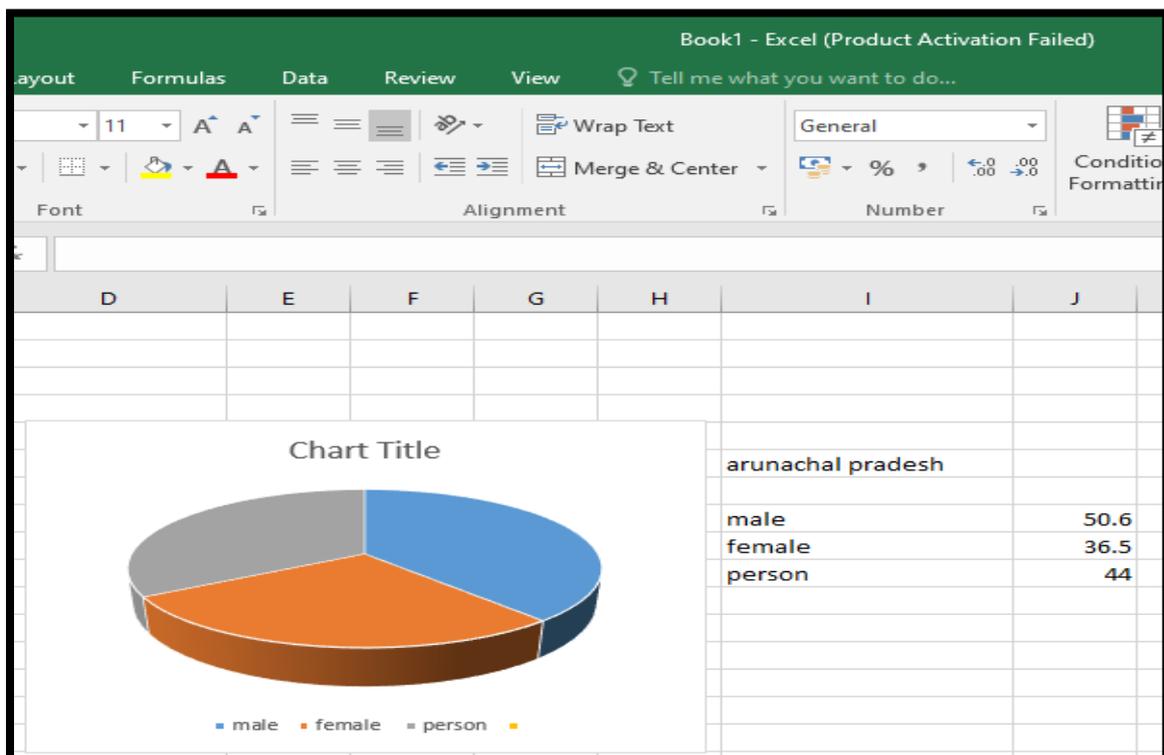
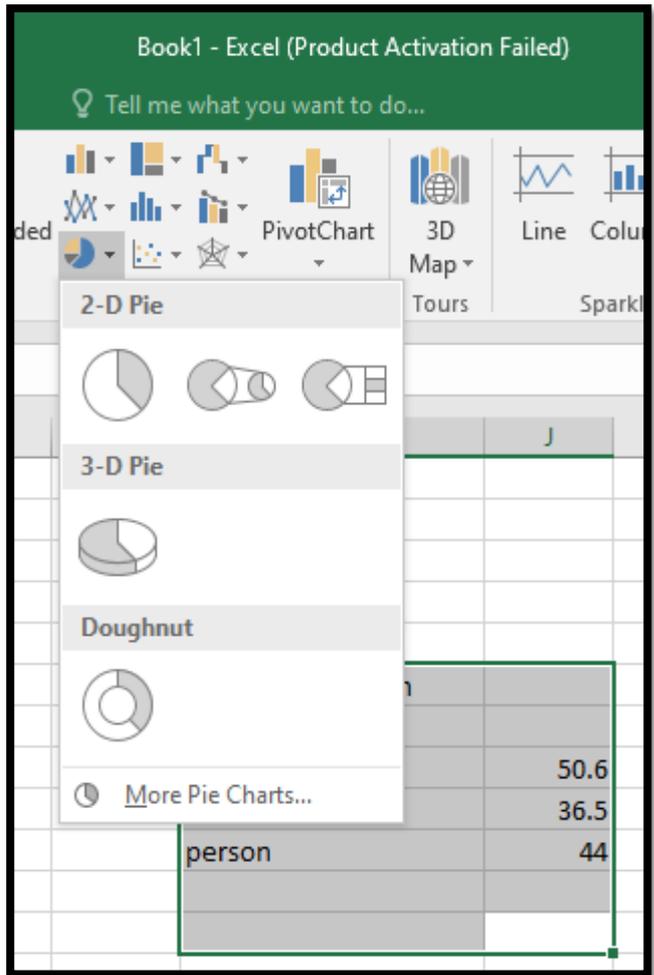
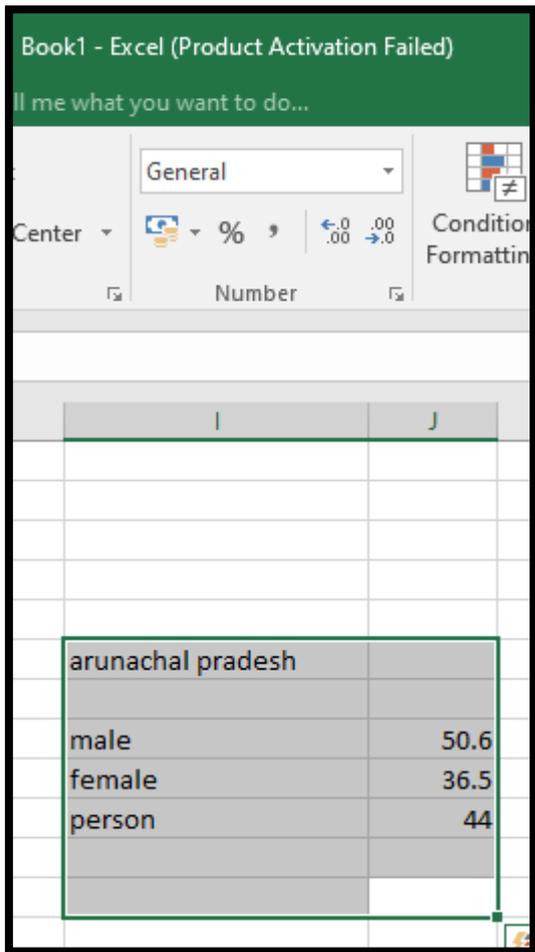
CALCULATION TABLE OF MALE AND FEMALE POPULATION IN NORTHERN STATE OF INDIA (2011)

SL NO	STATE	MALE	FEMALE	PERSON
1	ARUNACHAL PRADESH	50.6	36.5	44
2	MEGHALAYA	48.3	35.1	41.8
3	SIKKIM	57.4	38.6	48.6
4	ASSAM	49.9	20.7	35.8
5	TRIPURA	50.6	21.1	36.2
6	MIZORAM	57.3	47.5	52.6
7	NAGALAND	46.7	38.1	42.6
8	MANIPUR	48.1	39	43.6

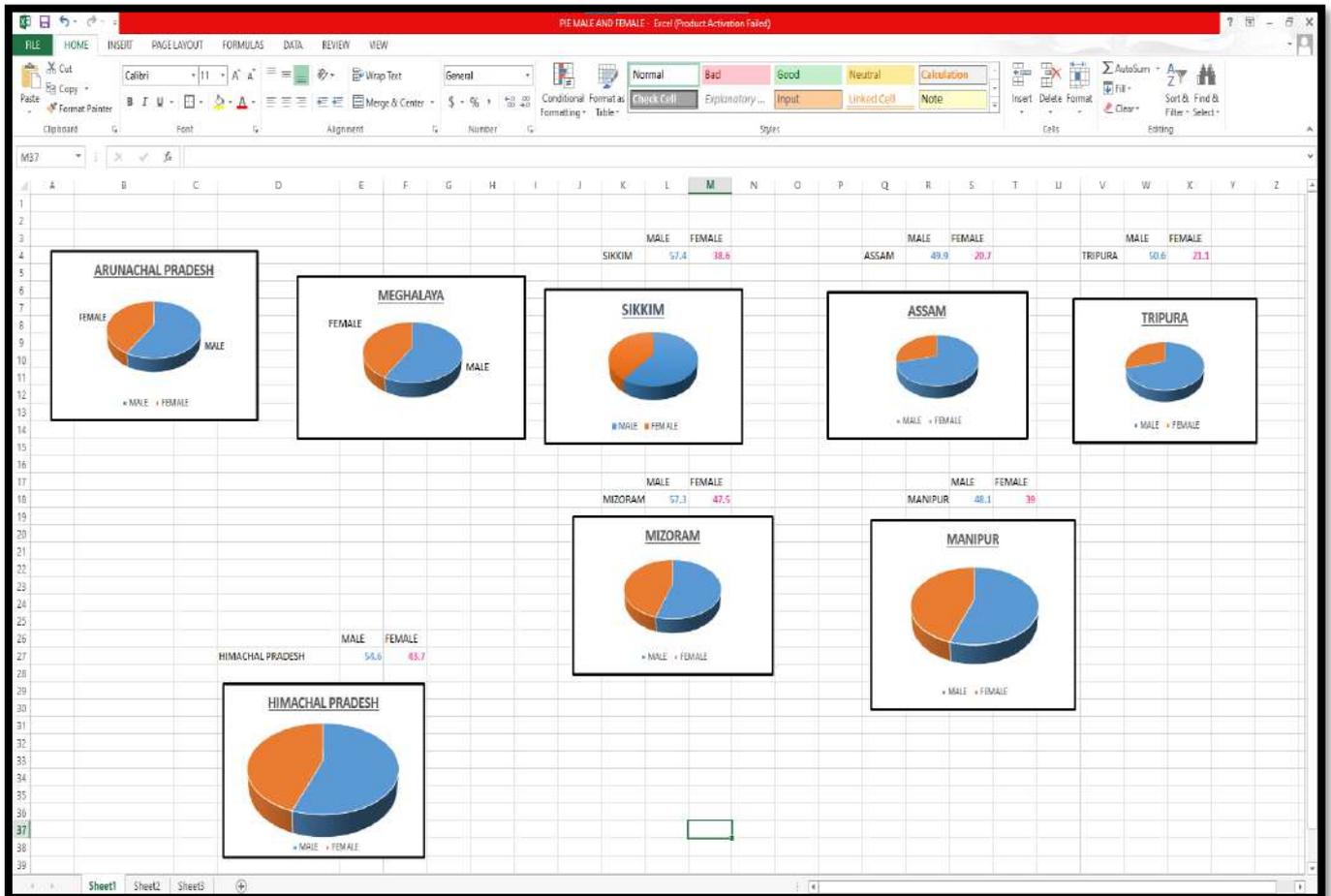
1.input the data in an excel sheet



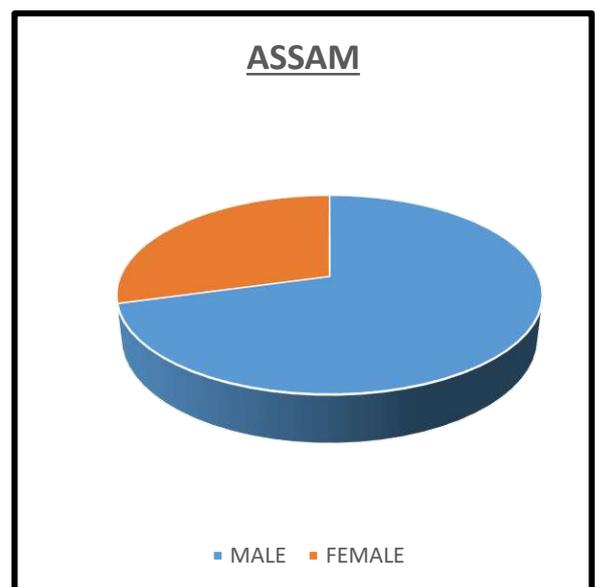
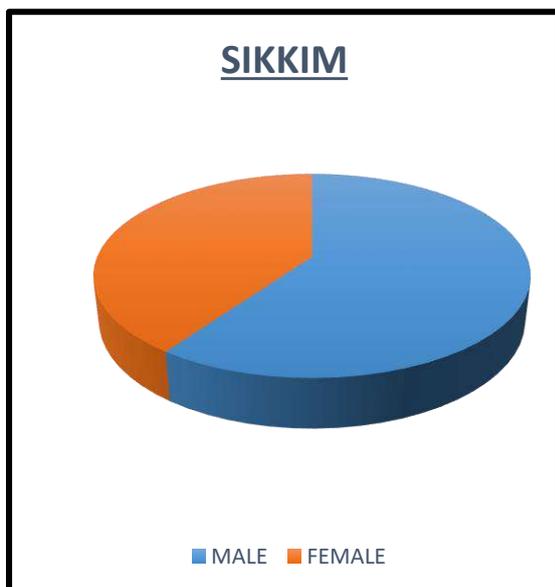
2. Select any particular data with male and female > insert pie



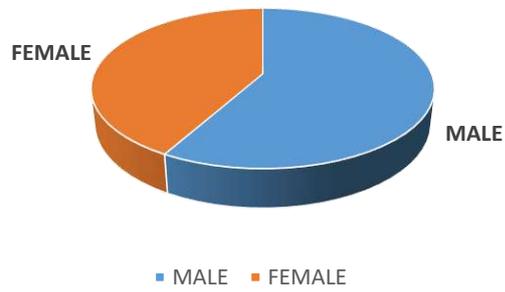
3. Do all 8 pie graph as per the 8 states data



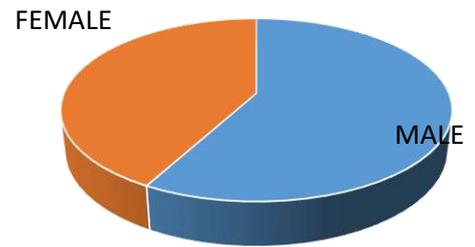
PIE DIAGRAM SHOWING MALE FEMALE DISTRIBUTION OF POPUYLATION IN NORTHERN STATE OF INDIA (2001)



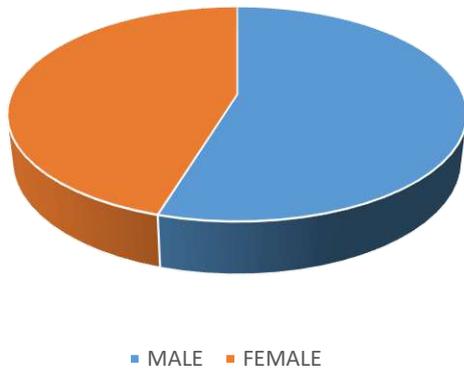
ARUNACHAL PRADESH



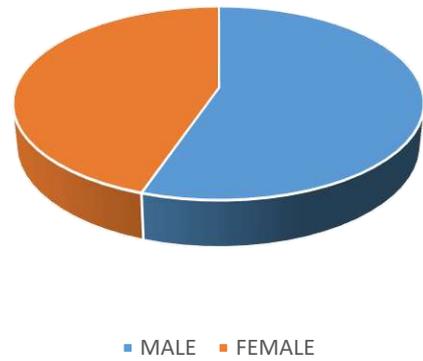
MEGHALAYA



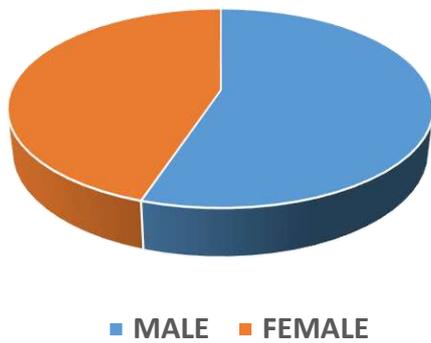
MIZORAM



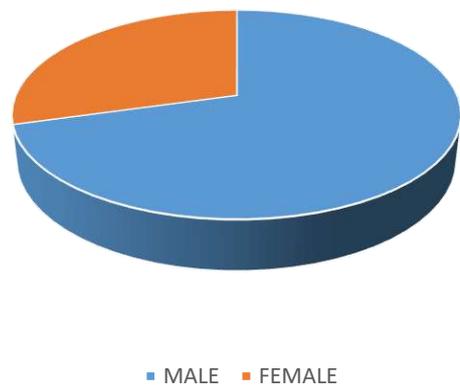
MANIPUR



NAGALAND



TRIPURA

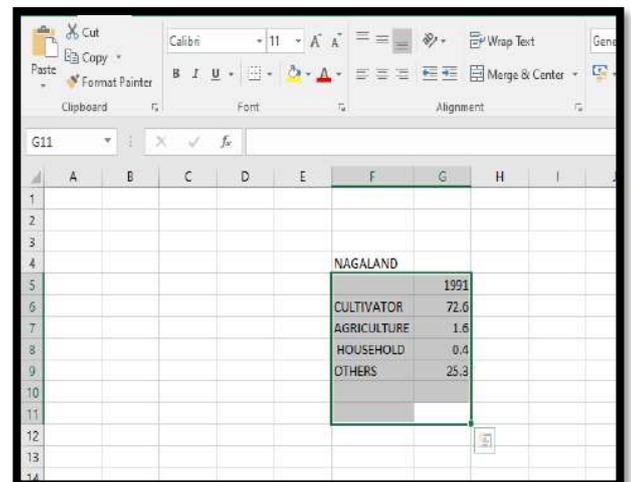
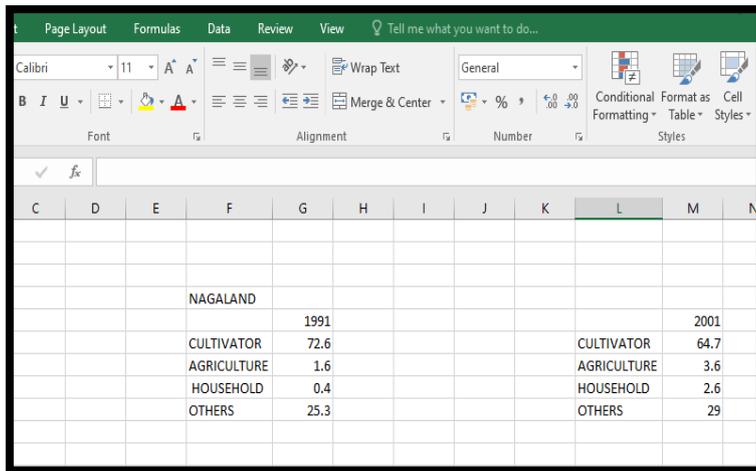


Occupational structure

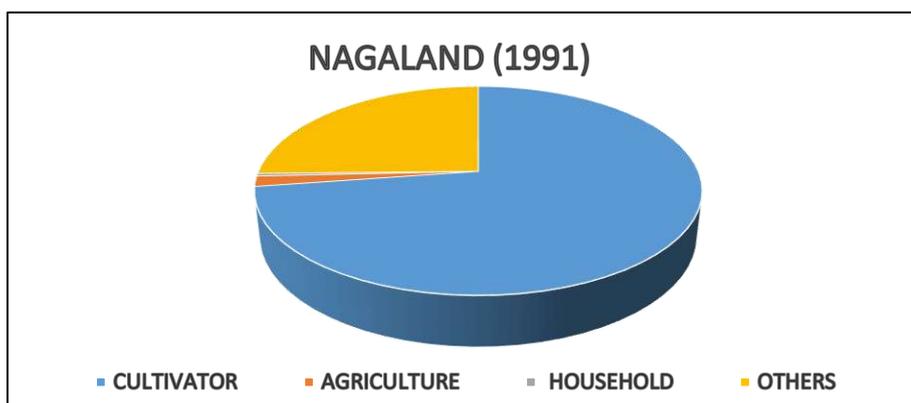
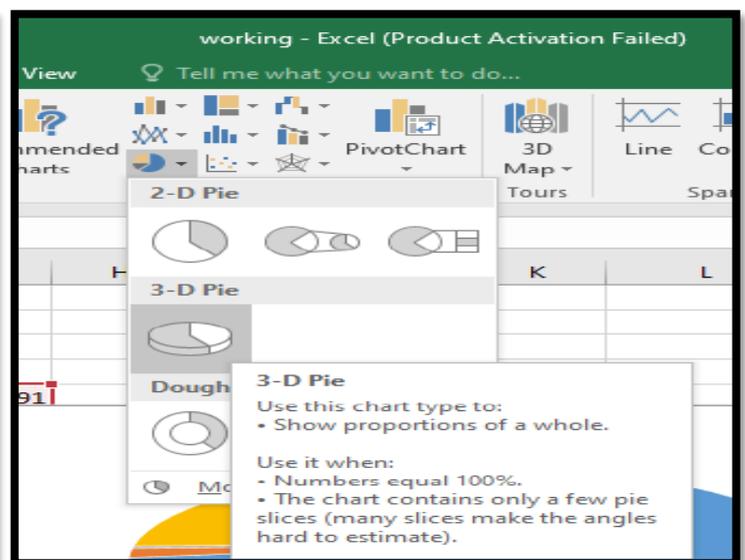
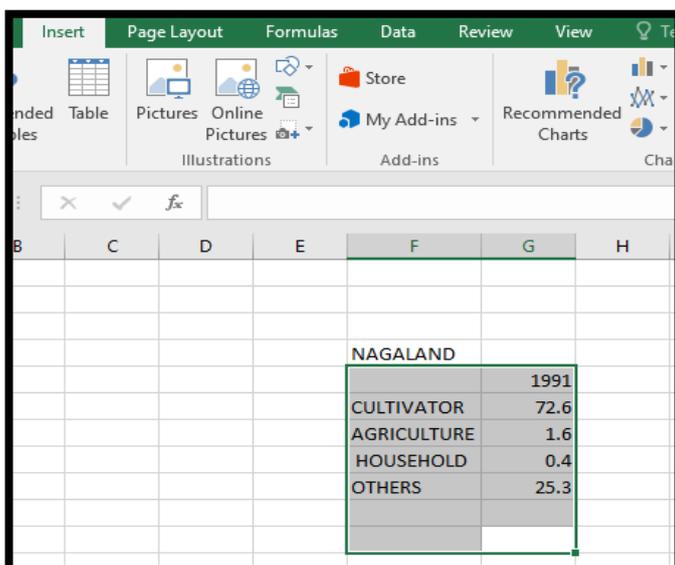
This refers to the aggregate distribution of occupations in society, classified according to skill level, economic function, or social status. The occupational structure is shaped by various factors: the structure of the economy (the relative weight of different industries); technology and bureaucracy (the distribution of technological skills and administrative responsibility); the labour-market (which determines the pay and conditions attached to occupations); and by status and prestige (influenced by occupational closure, life-style, and social values). It is difficult to attach causal primacy to any one of these factors; moreover, their role in shaping the occupational structure changes over time, as society changes. For example, during the early phase of European industrialization, the dominance of manufacturing made for a preponderance of manual occupations, while in recent times the shrinking of this sector, together with the growth in services, has made for an expansion of white-collar occupations. The distinction between manual and non-manual occupations has also become blurred. The occupational structure is described and analysed by means of various classificatory schemes, which group similar occupations together according to specific criteria such as skill, employment status, or function. Such classifications are also used as a basis for the empirical analysis of economic and social class. See also INDUSTRIAL SECTOR; OCCUPATIONAL CLASSIFICATION.

STATES	CULTIVATORS		AGRICULTURAL LABOURERS		HOUSEHOLD INDUSTRY WORKERS		OTHER WORKERS	
	2001	1991	2001	1991	2001	1991	2001	1991
ARUNACHALPRADESH	57.8	60.8	3.9	5.4	1.3	0.2	37.0	33.7
ASSAM	39.1	54.8	13.2	12.6	3.6	1.0	44.0	31.7
MANIPUR	40.2	59.9	12.0	10.3	10.3	6.0	37.6	23.8
MEGHALAYA	48.1	56.3	17.7	13.0	2.2	0.4	32.0	30.3
MIZORAM	54.9	62.3	5.7	5.4	1.5	1.1	37.9	31.2
NAGALAND	64.7	72.6	3.6	1.6	2.6	0.4	29.0	25.3
TRIPURA	27.0	39.0	23.8	24.2	3.0	1.6	46.1	35.2
SIKKIM	49.9	58.0	6.5	8.2	1.6	0.8	42.0	33.1
WEST BENGAL	18.4	25.0	31.0	36.2	5.4	3.6	45.3	35.2

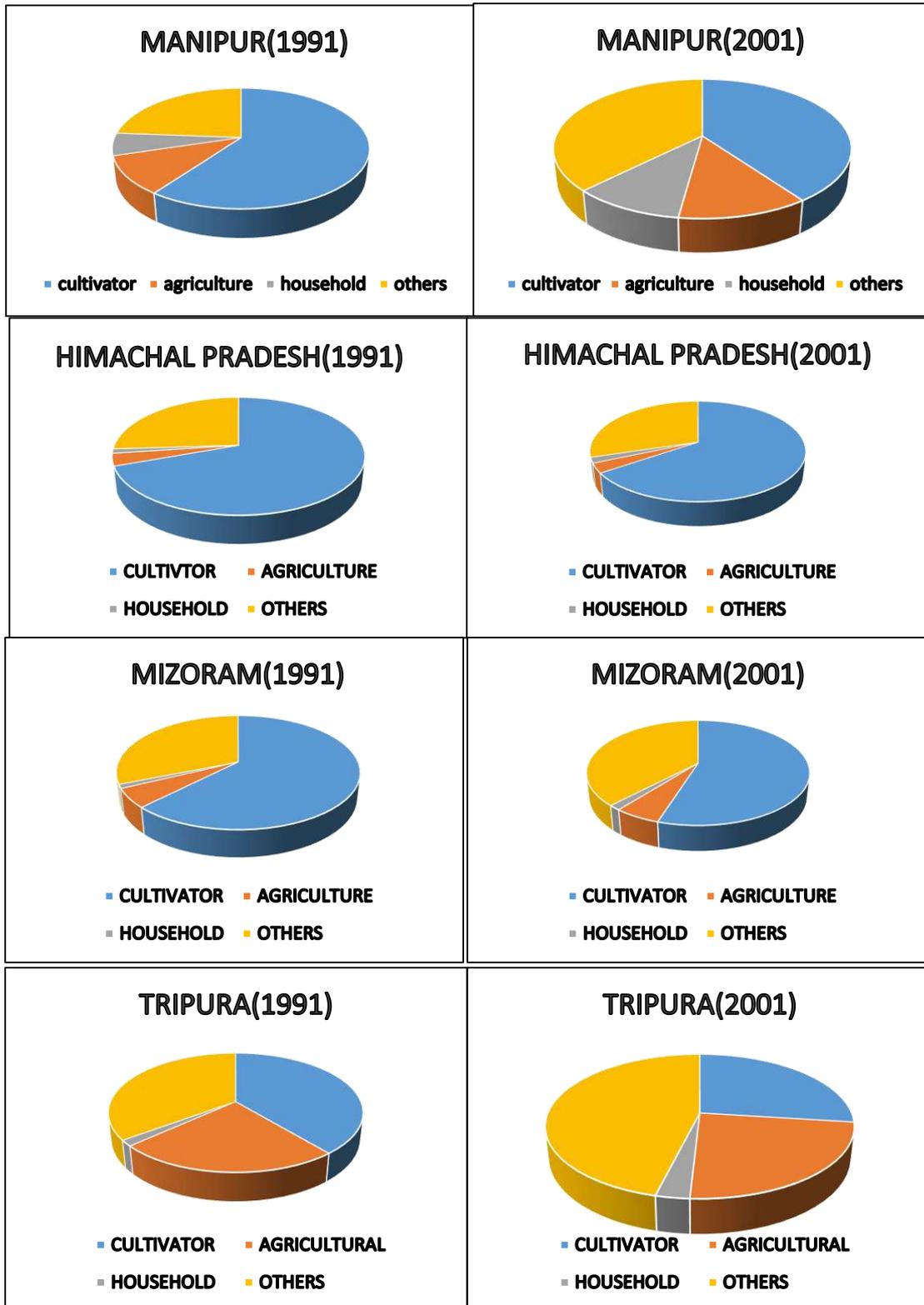
1. open the excel sheet. Then put the data in excel and select the data.

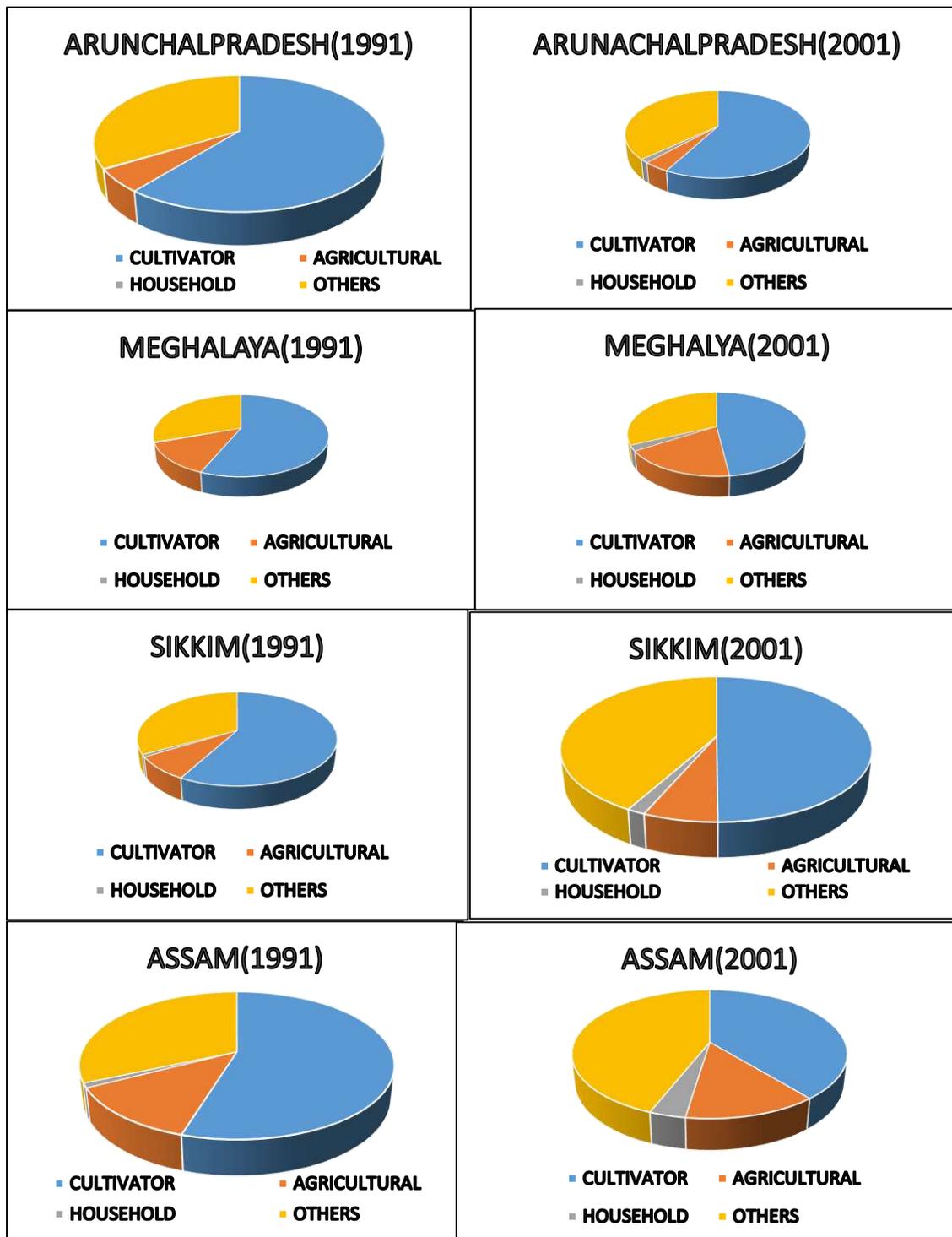


3. after select the data, then go to insert > then pie diagrams and finally showing the pie diagram



OCCUPATIONAL STRUCTURE IN NORTHERN STATE OF INDIA





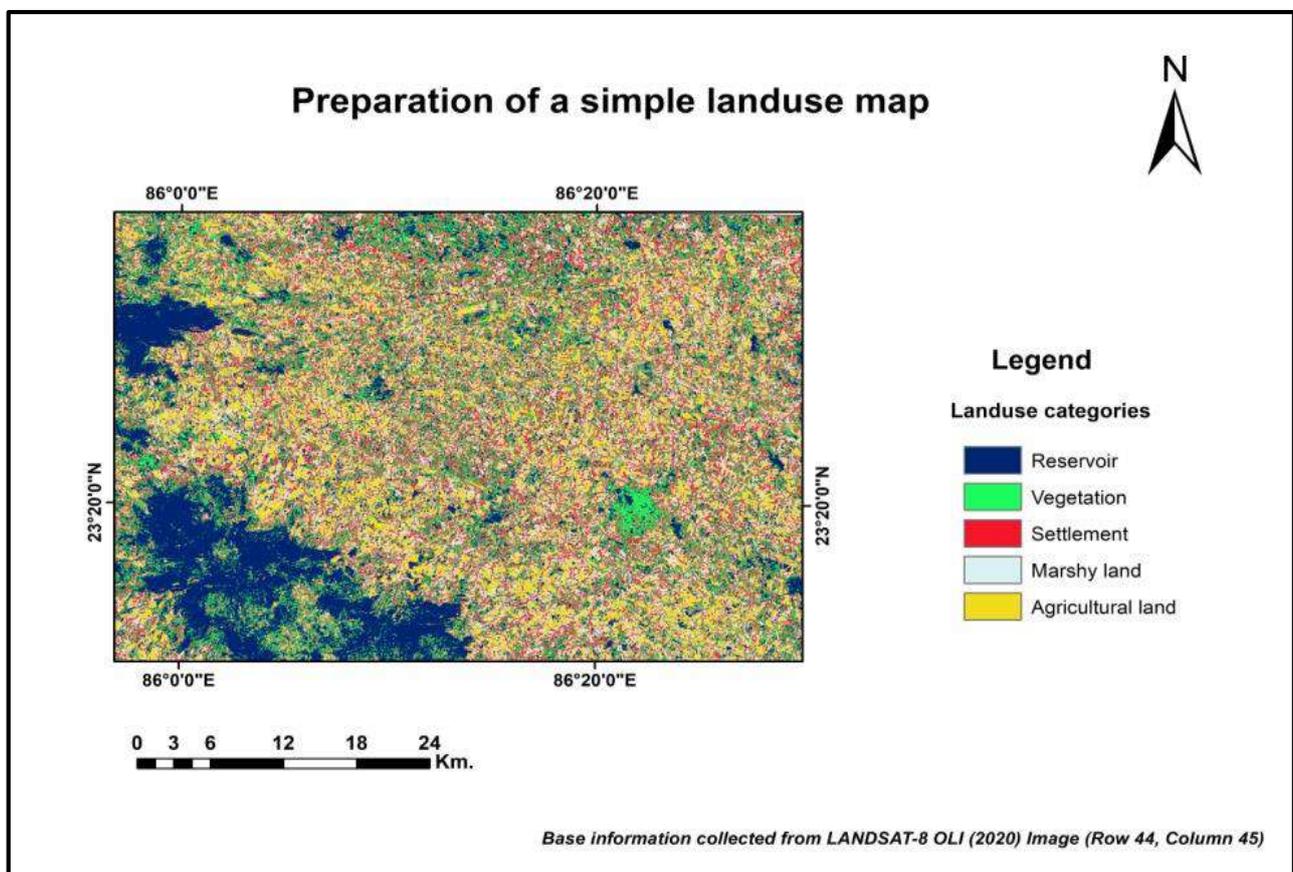
INTERPRETATION

The above pie diagrams show the occupational structure of the people of North Eastern States of India. The occupations have been classified into four categories- cultivator, agricultural, household and others. The first pie diagrams show the occupational structure of Manipur in the year 1991 and 2001. In 1991 most of the people almost 60% are engaged in cultivator. But in the year 2001 it has decreased to 40.2%. In the year 2001, these 20 % people have changed their occupation to other economic activities. But in Himachal Pradesh % of people engaged in different types of economic activities are almost same for both the years 1991 and 2001. From

the above diagrams we can interpret that people from north east India mostly engaged in cultivators. Very few people engaged in agricultural and household activities.

APPLICATION OF GIS & RS

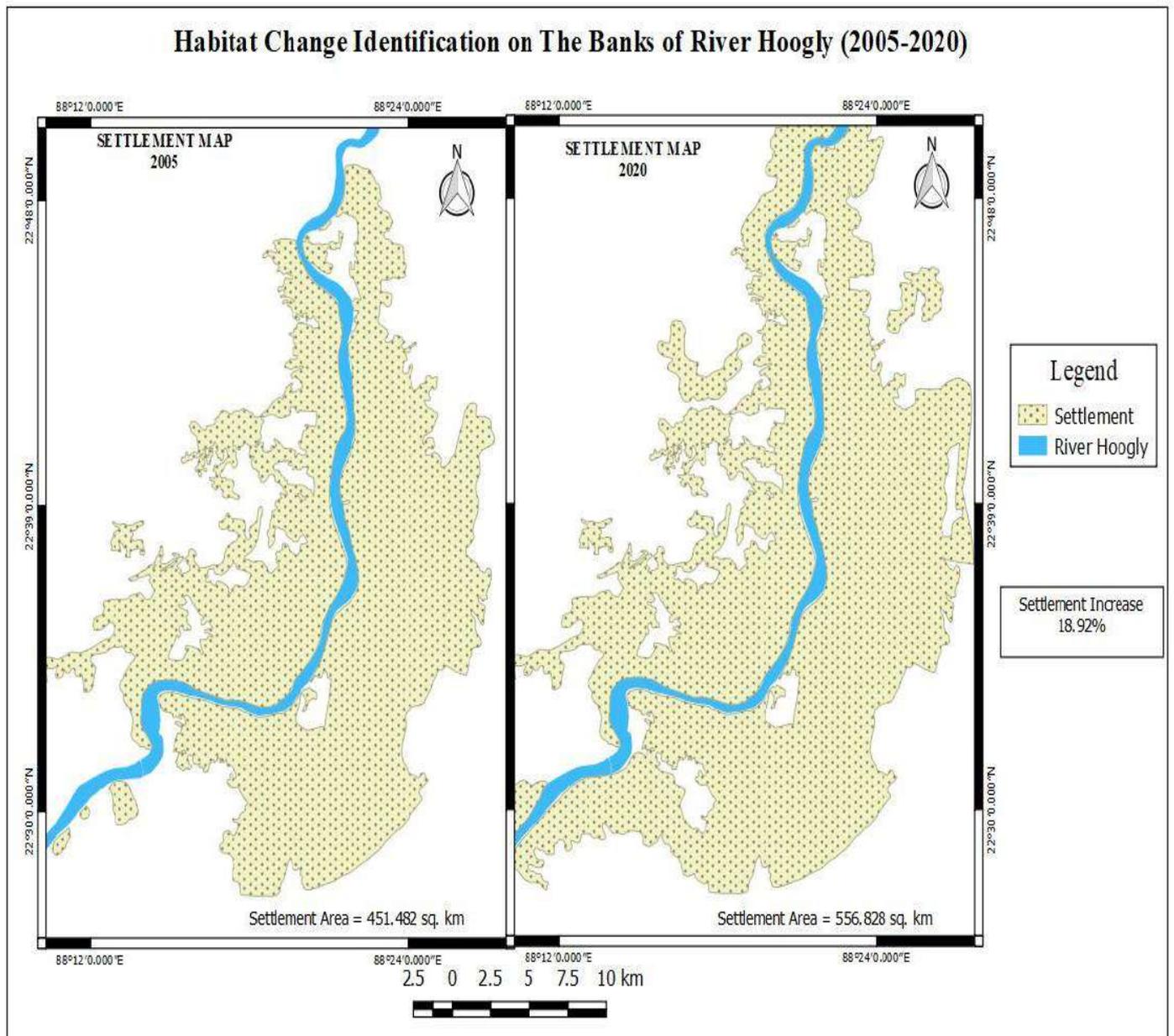
Preparation of Land Use Map Using Open Soft Ware: Land Use maps of an area provide information to help users to understand the current landscape. The map, that reflects the land resources and types of land use in the national economy. Land use maps are subdivided into land resource, land in service, and agricultural land use maps.



INTERPRETATION:

Here we have prepared a land use map of Purulia District. A major part of the area is covered by agricultural land (34.44971 sq. km). In this land use map 4.3496 sq. km, 15.3275 sq. km, 20.9375 sq. km, and 24.9356 sq. km area are covered by settlement, reservoir, vegetation and marshy land respectively.

MAPPING OF HUMAN HABITATION & DETECTION OF CHANGE:



INTERPRETATION:

The above map displayed the habitat change on the banks of river Hooghly. Here we have taken 2 satellite maps (year of 2005 and 2020) of the bank of the Hooghly river. The map shows that; the settlement of the mentioned area has increases about 18.92%.

$$\% \text{ of Settlement change} = \left[\frac{\text{Area of 2020} - \text{Area of 2005}}{\text{Area of 2005}} \right] * 100$$

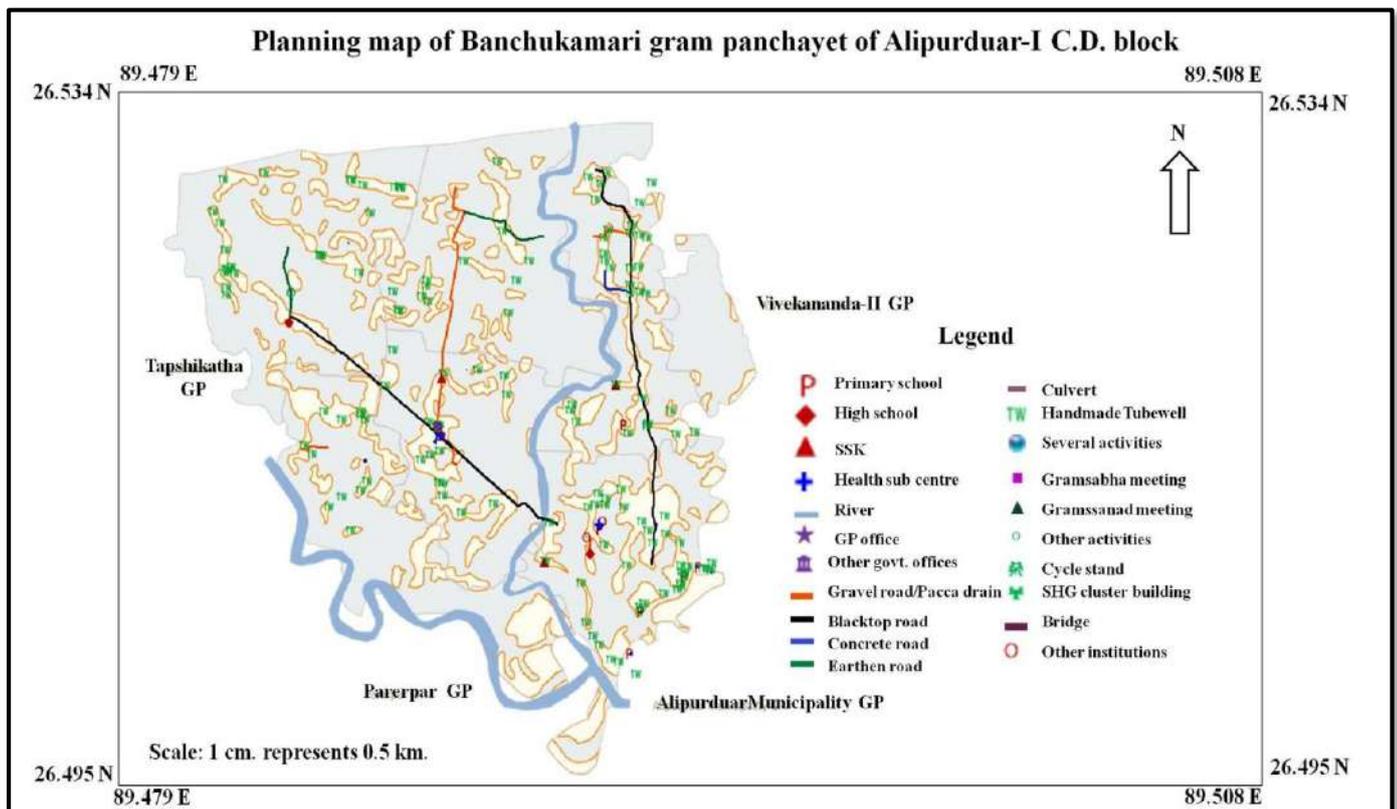
SPATIAL PLAN FORMULATION & LAYOUT FOR A VILLAGE LEVEL PLANNING

Village maps are effective tools that help in understanding the geography of a village settlement. It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.

Village maps are effective tools that help in understanding the geography of a village settlement. It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.

Key Benefits:

- Conducts social mapping to illustrate the layout of houses, streets, hamlets and infrastructure in the village
- Identifies the most ideal locations to open schools
- Helps in making assessment regarding the status of the village, infrastructure facilities and employment opportunities
- Identifies the infrastructural and other development needs of the village
- It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.
- It also helps in determining the road networks i.e. the national's highways, state highways with major rivers and forest around the particular village



WEST BENGAL STATE UNIVERSITY

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Semester: IV

Subject: Geography

Paper: Regional Planning and Rural Development Practical

Paper Code: GEOPDSE04P

Paper Type: Practical

UNIT 1: RURAL RESEARCH METHOD AND METHODOLOGY

1.1 PRE-FIELD ISSUES ON RURAL RESEARCH

CONTEMPORARY RESEARCH TRENDS:

Research Trends is an online publication providing objective insights into scientific trends based on bibliometric analyses. Worldwide, there is a growing demand for quality research performance measurement and trend-related information by deans, faculty heads, researchers, funding bodies and ranking agencies.

The author of this article highlights the exploration for contemporary research trends within technology management. Thereby, this paper primarily focuses on investigating research areas and issues connected with technology management in contemporary scientific publications selected from the Web of Science database. The results of the undertaken overview of the selected literature lead to a visualization of issues most frequently occurring in configuration with technology management, as well as the aspect of their coexistence in the analyzed compilation of literature. Along with the description of the conducted analysis, it constitutes a fundamental result of this work.

The main aim of the article is the identification and critical assessment of the most commonly used models and methods of measuring service quality. The last part of the paper is dedicated to the overview of measurement issues taking into account the specific features of logistics service. The paper was based on the research method of systematic literature review and critical analysis of research achievements. The article includes: (i) definitions of service quality, (ii) identification of the most popular models of service quality, (iii) overview of measuring methods of service quality, and (iv) the main research achievements on account of logistics service quality. This article aims to identify the trends and dynamics of changes in city logistics on the basis of bibliometric data of international literature published in the ISI Web of Science, Scopus, Elsevier, Emerald and EBSCO host databases in recent years. The study made use of basic techniques of the bibliometric method with the support of the VOS viewer software. On the basis of a huge number of literary works, the analysis allowed for the assessment in terms of chronological development of research concerning city logistics and the identification of main authors, publications, and journals being of crucial significance to this area of research.

Literature search on research problem stated:-

Literature search is a key step in performing good authentic research. It helps in formulating a research question and planning the study. Various databases are available for performing literature search. This article primarily stresses on how to formulate a research question, the various types and sources for literature search, which will help make your search specific and time-saving. Literature search is a systematic and well-organized search from the already published data to identify a breadth of good quality references on a specific topic.

[1] The reasons for conducting literature search are numerous that include drawing information for making evidence-based guidelines, a step in the research method and as part of academic assessment.

[2] However, the main purpose of a thorough literature search is to formulate a research question by evaluating the available literature with an eye on gaps still amenable to further research.

[3] Research problem is typically a topic of interest and of some familiarity to the researcher. It needs to be channelised by focussing on information yet to be explored. Once we have narrowed down the problem, seeking and analysing existing literature may further straighten out the research approach.

[4] A research hypothesis is a carefully created testimony of how you expect the research to proceed. It is one of the most important tools which aids to answer the research question. It should be apt containing necessary components, and raise a question that can be tested and investigated.

The literature search can be exhaustive and time-consuming, but there are some simple steps which can help you plan and manage the process. The most important are formulating the research questions and planning for search.

A research problem, or phenomenon as it might be called in many forms of qualitative methodology, is the topic would you like to address, investigate, or study, whether descriptively or experimentally. It is the focus or reason for engaging in your research. It is typically a topic, phenomenon, challenge that you are interested in and with which you are at least somewhat familiar.

For example, when students encounter difficulties with word problems in math, teachers may initially think that students have not mastered the basic skills that would allow them to carry out the needed computations. However, the difficulty may actually lie in poor reading skill, which prevent the students from identifying the words in math problems. The students also might not understand or correctly interpret essential vocabulary.

Framing Research Question and Hypothesis:-

Framing a clear research question is a crucial part of developing your research proposal, and should be seen as emerging from a dialogue between a developing theoretical position and decisions you need to take about research design and subsequent data analysis.

Any empirical research—quantitative or qualitative—should be guided from the outset by a question or set of questions. The question defines precisely what is being examined and how an assessment of the results will be undertaken.

The research question begins with a research problem, an issue someone would like to know more about or a situation that needs to be changed or addressed, such as:

- Areas of concern
- Conditions that could be improved
- Difficulties that need to be eliminated
- Questions seeking answers

Characteristics of a good research question:

- The question is feasible.
- The question is clear.
- The question is significant.
- The question is ethical.

The feasibility of the question should guide not only the expression of the question but its conception. Feasibility should be foremost in the researcher's mind in the earliest stages of any project. Reviewers will always evaluate the feasibility of a question (possibly before other elements).

Clear expression signals clear thinking. Not only must the question be clear in the mind of the researcher, it must be articulated clearly. Again, reviewers of a manuscript will insist upon clear question so that the potential audience will be able to understand the question and, thus, follow the write-up of the project.

Significance may be said to be in the eye of the beholder. One way to gauge significance is to ascertain whether a reading audience will be able to take away a lesson from the project. Work that is very limited—say, to a single organization—may not be looked upon with favor by reviewers. If the question and the project are important enough that readers learn from the work, then it generally passes the significance test.

Research Questions and Research Hypotheses:

As will be discussed extensively in later Web Notes, research questions are formulated in conjunction with research hypotheses (also referred to as “conceptual hypotheses”). Importantly, researchers should formulate research questions and hypotheses at the same time; rarely if ever are research questions and research hypotheses done independently of each other. Indeed, the process presented in this class essentially requires that these two steps occur simultaneously. Research hypotheses serve a variety of purposes, however, most important at this stage of the research process is that research hypotheses help to “justify” whether a research question is sufficiently important to collect the data needed to answer it. If not, the question should be dropped. Another useful role of hypotheses is to help generate implied research questions. So although this topic is not covered just yet, bear in mind that research questions and research hypotheses work hand in hand and no discussion of research questions can be complete with incorporating research hypotheses into it.

Hypothesis:

Hypothesis is an assumption that is made on the basis of some evidence. This is the initial point of any investigation that translates the research questions into a prediction. It includes components like variables, population and the relation between the variables. A research hypothesis is a hypothesis that is used to test the relationship between two or more variables.

Sources of Hypothesis - Following are the sources of hypothesis:

- The resemblance between the phenomenon.
- Observations from past studies, present-day experiences and from the competitors.
- Scientific theories.
- General patterns that influence the thinking process of people.

Types of Hypothesis - There are six forms of hypothesis and they are:

- Simple hypothesis
- Complex hypothesis
- Directional hypothesis
- Non-directional hypothesis
- Null hypothesis
- Associative and casual hypothesis.

Examples of Hypothesis - Following are the examples of hypothesis based on their types:

- Consumption of sugary drinks every day leads to obesity is an example of a simple hypothesis.
- All lilies have the same number of petals is an example of a null hypothesis.
- If a person gets 7 hours of sleep, then he will feel less fatigue than if he sleeps less.

Functions of Hypothesis - Following are the functions performed by the hypothesis:

- Hypothesis helps in making an observation and experiments possible.
- It becomes the start point for the investigation.
- Hypothesis helps in verifying the observations.
- It helps in directing the inquiries in the right directions.

Selecting study area and target population:-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work”. Ideally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

There are few areas in business studies that can offer interesting topics due to their dynamic nature. The following is the list of research areas and topics that can prove to be insightful in terms of assisting you to choose our own dissertation topic.

The target population is the group of individuals that the intervention intends to conduct research in and draw conclusions from. Target population is an informal term used mostly in epidemiology. It's general defined to mean a group or set of elements that you want to know more information about.

Most of the time, "target population" and "population" are synonymous. However, adding the word target emphasizes that sometimes we miss the mark in sampling, and don't always hit the mark: samples can be unrepresentative of the population that you originally intended to sample. For example, you might want to survey all the hospitalized adults in the United States (the target population), but budget constraints limit your survey to hospital patients just four cities in the U.S. The sampled population and targeted population in this scenario are likely to be quite different.

Target Population Units:

In some areas like regression analysis in epidemiology, it's especially important to identify the target population. While data analysis in the sciences always includes the correct units (e.g. was time measured in seconds, decades, or light years?), specific information about the population is left out.

Identifying and collecting relevant secondary data:-

Secondary data is one of the two main types of data, where the second type is the primary data. These 2 data types are very useful in research and statistics, but for the sake of this article, we will be restricting our scope to secondary data.

Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

A data classified as secondary for a particular research may be said to be primary for another research. This is the case when a data is being reused, making it a primary data for the first research and secondary data for the second research it is being used for.

Sources of Secondary Data:

Sources of secondary data includes books, personal sources, journal, newspaper, website, government record and many others. Secondary data are known to be readily available compared to that of primary data. It requires very little research and need for manpower to use these sources.

With the advent of electronic media and the internet, secondary data sources have become more easily accessible. Some of these sources are highlighted below.

Steps in Secondary Data Analysis:

Stepping Your Way through Effective Secondary Data Analysis

1. Determine your research question – As indicated above, knowing exactly what you are looking for.
2. Locating data– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.
3. Evaluating relevance of the data – Considering things like the data's original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. Assessing credibility of the data – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.

Preparing survey schedule and questionnaire:

A schedule is a structure of a set of questions on a given topic which are asked by the interviewer or investigator personally. The order of questions, the language of the questions and the arrangement of parts of the schedule are not changed. However, the investigator can explain the questions if the respondent faces any difficulty. It contains direct questions as well as questions in tabular form. Schedule include open-ended questions and close-ended questions. Open-ended questions allow the respondent considerable freedom in answering. However, questions are answered in details. Close-ended questions have to be answered by the respondent by choosing an answer from the set of answers given under a question just by ticking.

Following are the different types of schedules used by social scientists and anthropologists.

- ***Village or community schedule:*** It is used by census researchers who collect general information on populations, occupations, etc.
- ***Family or Household schedule:*** It gives full demographic details of households, the status of individuals, data on education, age, family relations, etc.

- ***Opinion or attitude schedule:*** To schedule the views of the population regarding an issue.

Questionnaire:

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. A research questionnaire is typically a mix of close-ended questions and open-ended questions. Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts.

The data collected from a data collection questionnaire can be both qualitative as well as quantitative in nature. A questionnaire may or may not be delivered in the form of a survey, but a survey always consists of a questionnaire.

Questionnaire Examples

The best way to understand how questionnaires work is to see the types of questionnaires available. Some examples of a questionnaire are:

Customer Satisfaction Questionnaire - This type of research can be used in any situation where there's an interaction between a customer and an organization. For example, you might send a customer satisfaction survey after someone eats at your restaurant. You can use the study to determine if your staff is offering excellent customer service and a positive overall experience.

Product Use Satisfaction Questionnaire - You can use this template to better understand your product's usage trends and similar products. This also allows you to collect customer preferences about the types of products they enjoy or want to see on the market.

Company Communications Evaluation Questionnaire - Unlike the other examples, a company communications evaluation looks at internal and external communications. It can be used to check if the policies of the organization are being enforced across the board, both with employees and clients.

Types of questions in a questionnaire

Using various question types can help increase responses to your research questionnaire as they tend to keep participants more engaged.

- **Open-Ended Questions** - Open-ended questions help collect qualitative data in a questionnaire where the respondent can answer in a free form with little to no restrictions.
- **Dichotomous Questions** - The dichotomous question is generally a "yes/no" close-ended question. This question is usually used in case of the need for necessary validation. It is the most natural form of a questionnaire.
- **Multiple-Choice Questions** - Multiple-choice questions are a close-ended question type in which a respondent has to select one (single-select multiple-choice question) or many (multi-select multiple choice question) responses from a given list of options. The multiple-choice question consists of an incomplete stem (question), right answer or answers, incorrect

answers, close alternatives, and distractors Scaling Questions - These questions are based on the principles of the four measurement scales – nominal, ordinal, interval, and ratio.

- Pictorial Questions - This question type is easy to use and encourages respondents to answer. It works similarly to a multiple-choice question. Respondents are asked a question, and the answer choices are images. This helps respondents choose an answer quickly without over-thinking their answers, giving you more accurate data.

1.2 ISSUES ON FIELD RESEARCH : PILOT STUDY BASED ON QUESTIONNAIRE , ETHNOGRAPHIC FIELD DIARY: LONGITUDINAL STUDY CASE STUDY, ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

PILOT STUDY:

A pilot survey is **a strategy used to test the questionnaire using a smaller sample compared to the planned sample size**. In this phase of conducting a survey, the questionnaire is administered to a percentage of the total sample population, or in more informal cases just to a convenience sample.

Advantages of a pilot survey:

Conducting a pilot survey prior to the actual, large-scale survey presents many benefits and advantages for the researcher. One of these is the exploration of the particular issues that may potentially have an antagonistic impact on the survey results. These issues include the appropriateness of questions to the target population.

A pilot survey also tests the correctness of the instructions to be measured by whether all the respondents in the pilot sample are able to follow the directions as indicated. It also provides better information on whether the type of survey is effective in fulfilling the purpose of the study. Practically speaking, pilot surveys save financial resources because if errors are found in the questionnaire or interview early on, there would be a lesser chance of unreliable results or worse, that you would need to start over again after conducting the survey.

All in all, the main objective of a pilot study is to determine whether conducting a large-scale survey is worth the effort.

Types of Pilot Survey:

A. According to Organization

There are two types of pilot survey according to organization – external and internal. An external pilot survey intends to administer the questionnaire to a small group of target participants who will not be included in the main survey. On the other hand, an internal pilot survey will consider the respondents in the pilot as the first participants in the main survey.

B. According to Respondent Participation

There are two types of pilot survey according to the participation of the respondents – undeclared and participatory. In an undeclared pilot survey, you administer the survey to a certain number of respondents as if it is the real and full scale survey, not a pretest one. On the other hand, participatory pilot surveys involve informing the respondents that they are in

the pre-test phase. The respondents are to be asked what they can say about the questionnaire, specifically their reactions, comments and suggestions. For instance, you may ask them about how clear the instructions are or which questions are hard to answer. Converse and Presser (1986) recommend using the participatory pilot survey first, and then conducting the undeclared pilot.

The Results of a Pilot Survey:

After obtaining and analysing the results of the pilot survey, logistical, technical and other issues or problems can be addressed. The questionnaire or interview format can be revised, or the type of survey may be altered into a more suitable one. After the revision of the survey, the researcher may opt to conduct a second pilot survey to determine whether the errors and issues are effectively solved. If the problems were minor, then the large-scale survey can be executed.

❖ ETHNOGRAPHIC FIELD DIARY:

Ethnographic research **involves the study of people in situ**. It involves the study of informants, their actions and their activities as they occur. Such an approach presupposes that the researcher can gain access to informants and their activities.

Ethnographers have devoted a great deal of attention on the issues of writing the final product of ethnographic research, the ethnographic research report. The issues related to the process of writing ethnographic field notes, however, have received much less attention in methodological discussions. Emerson et al. (1995) point out that even after the discovery of 'writing' as a central practice of ethnographic research (Clifford & Marcus 1986, Van Maanen 1988), field notes remained as 'invisible work' in ethnographic literature. They argue that while many ethnographers are uneasy with the messy, unfinished, and personal character of their field notes, these have mostly remained private documents. Remaining private documents, the impact of field notes on research findings and results has also left unexplored. Why should we pay more attention to field notes? Although there is no consensus

concerning how ethnographic field notes should be written and what is their value in ethnographic research, most ethnographers (and many other qualitative researchers) produce some kind of field notes, particularly when doing observations. When planning and producing field notes in situ or afterwards ethnographers continuously make choices about what to write down and how. Because it is impossible to collect data on everything and record all the things that are going on in the field, the researcher needs, by necessity, be selective in her writing. Furthermore, the researcher writes down her notes drawing from her sense making of the people, events and the situation and her interpretation can be different, or at least have different details and nuances, compared to another researchers' field notes from the same situation. Field notes are important because they involve the critical acts of sense making and interpretation, which inevitably have some kind of bearing

on the research findings and results. To be able to understand what kind of bearing the field notes can have on your research, it is necessary to practice reflexivity in respect to one's own field notes and their analysis. In this chapter, we will answer to the request of taking written field notes and their analysis more seriously in ethnographic research. Our main objective is to open up and analyse the process of writing and analysing ethnographic field notes. We will perform this through the investigation of our joint research project, which focused on business, technology and gender in the context of the Finnish ICT-sector. . In our investigation, we will practice reflexivity in terms of exploring the relationship between the researcher and the field, questioning the knowledge that is produced in field notes and in their analysis. More specifically, we will focus attention on how the social identities of the researchers affect how knowledge about the research subjects is produced and with kind of consequences. Our analysis elaborates two different modes of writing the field notes - selection and sense-making activities and textual practices of representation - and their implications on our research. In our analysis, we will pay close attention to the processes of exclusion, which take place through othering and marginalizing certain groups of actors involved in our research. With regards to selection and sense-making activities, we will ask what and who do we decide as 'important' and 'relevant' enough to be included into our field notes. We will also investigate why we considered some actors and events to be 'not-so-relevant' in relation to the goals of our project and how we justified these choices in our field notes. Through the analysis of our textual practices, we will further illustrate how and with what kinds of implications the 'relevant' and 'not-so-relevant' actors and encounters were crafted in our notes.

❖ **LONGITUDINAL STUDY:**

In a longitudinal study, researchers repeatedly examine the same individuals to detect any changes that might occur over a period of time.

Longitudinal studies are a type of correlation research in which researchers observe and collect data on a number of variables without trying to influence those variables.

While they are most commonly used in medicine, economics, and epidemiology, longitudinal studies can also be found in the other social or medical sciences.

❖ **CASE STUDY:**

The case study approach allows in-depth, multi-faceted explorations of complex issues in their real-life settings. The value of the case study approach is well recognized in the fields of business, law and policy, but somewhat less so in health services research. Based on our experiences of conducting several health-related case studies, we reflect on the different types of case study design, the specific research questions this approach can help answer, the data sources that tend to be used, and the particular advantages and disadvantages of employing this methodological approach. The paper concludes with key pointers to aid those designing and appraising proposals for conducting case study research, and a checklist to help readers assess the quality of case study reports.

❖ **ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA:**

Data collection is central part of community health improvement efforts. Sometimes, the aim is to learn more about a problem as it is experienced by a specific group of people; other times it is to see if people are better off after participating in an intervention. Most data is

collected through surveys, interviews, or observation. It's important to keep in mind the following when you collect data:

- It is good practice to let people know who you are (your name, organization and reason for collecting data when you ask them if they would like to participate. You should have permission from participants (people providing the data) and they should be made aware that their involvement is voluntary.
- Participants are free to withdraw from any active data collection or intervention program at any point without pressure or fear of retaliation. Avoid or minimize anything that will cause physical or emotional harm to participants.
- Make participants aware of any potential harm prior to their participation. Try to remain neutral and unbiased. Don't let your personal preconceptions or opinions interfere with the data collection process.
- Collecting data (i.e. through surveys) is often done under the assumption that information provided is confidential and the findings will be anonymous. You should let participants know when you will have to break confidentiality (e.g. in the case of harm to themselves or someone else) and whether results will be anonymous or not.
- When collecting data, try to avoid taking advantage of easy to access groups simply because they are there (this is called "convenience sampling"). Data should be collected from those that most help us answer our questions. Be respectful of people's time and when possible, compensate them for it.
- Be sure to protect the data you collect from people. Do not leave anything with personal information in a place that can easily be accessed by people who do not need to see the data (e.g. the back seat of your car). If possible, keep the information in a secure or locked location.
- After data are analyzed it is always good to share the results back to the participants. If anything on these guidelines is new to you, please consult with the NJHC's Data Committee. They can help design data collection activities that comply with these guidelines, and set you up to produce meaningful information for your workgroup.

1.3 FIELD TECHNIQUES : PARTICIPATORY RURAL APPRAISAL AND FOCUS GROUP DISCUSSION,

PARTICIPATORY RURAL APPRAISAL:

Participatory rural appraisal (PRA) is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes.

What is PRA process:

Participatory Rural Appraisal (PRA) is **a methodology used for interactive processes of social development**: It is a way of learning from people, with the people and by the people. It is, therefore, a methodology for analyses, planning, monitoring and evaluation.

"Participatory Rural Appraisal (PRA) recently renamed Participatory Learning for Action (PLA), is a methodological approach that is used to enable farmers to analyze their own situation and to develop a common perspective on natural resource management and agriculture at village level.

PRA is an assessment and learning process that empowers farmers to create the information base they need for participatory planning and action. Outsiders contribute facilitation skills and external information and opinions. Many different tools have been developed for use in PRA. There are four main classes: tools used in group and team dynamics; tools for sampling; options for interviews and dialogue; and options for visualization and preparing diagrams. Most countries have had some experience with PRA and local publications are available. IIED regularly reports on new developments in its PLA notes (Pretty et al 1995)."

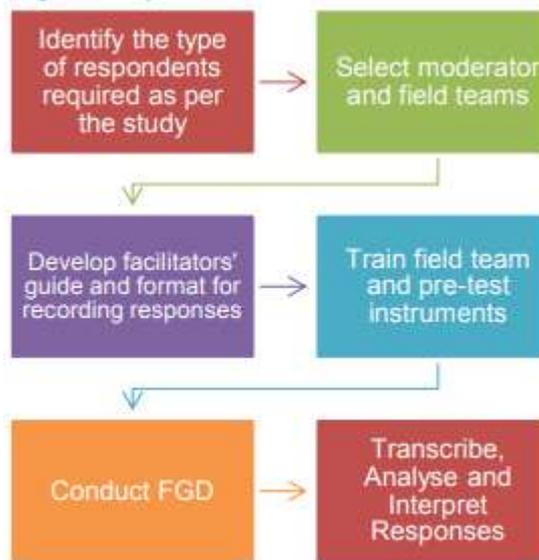
❖ **FOCUS GROUP DISCUSSION:**

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Key Features of FGDs:

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Major steps involved in FGDs:



Advantages of focus groups:

Focus groups have several advantages for collecting qualitative research data. Focus group research can be used purely as a qualitative method or in combination with quantitative methods. Qualitative data collected in focus groups can help researchers decide what kinds of items to include in surveys. The moderator can inquire into and examine unforeseen issues with that arise in the context of the discussion. The format has a kind of face-validity and is naturalistic in that the discussion can include storytelling, joking, disagreements, and boasting. Running focus groups is straightforward and relatively expensive. Focus groups ordinarily consume less time than structured interviews, thus increasing sample sizes, lessening resource investment, and providing fast results. Focus groups tend to be more efficient when the data being gathered are related to the researcher's interests. They are helpful and important for needs assessments and project evaluations. A focus group discussion can create a synergy that can provide information that can't be gained in other ways. Vocabulary can be observed. New, insightful perspectives and opinions are obtained. Sensitive topics can be discussed, leading to personal disclosures

1.4 POST FIELD TECHNIQUES: METHODS OF REPORT WRITING , TRANSCRIPTION FROM ETHNOGRAPHIC FIELD NOTES , AUDIO-VIDEO RECORDINGS, PARTICIPANT OBSERVATION, PRA AND FGD

• TRANSCRIPTION FROM ETHNOGRAPHIC FIELD NOTES:

For researchers doing qualitative research, interviews are a commonly used method. Data collected through interviews can be recorded through field notes, transcripts, or tape recordings. In the literature, there is a debate regarding which of these recording methods should be used. There are issues of reliability, cost (time and money), loss of data, among others. Technology plays a pivotal role in this debate. Indeed, new technologies (e.g., direct

coding) are often seen as potential replacements for older technologies (e.g., transcripts), which leads to a debate that is based on an evolution narrative (from field notes, to transcripts, to working from tape recordings). A combination narrative should be considered where combination is better than substitution. Moreover, combining the advantages of field notes, transcripts, and working from tape recordings without accumulating each method's disadvantages is possible because of new technology. Two technological tools (OneNote and SmartPen) are presented as a way to increase the effectiveness, efficiency, and economy of qualitative data management.

Fasick (1977) mentioned the cost and difficulties associated with transcripts. Indeed, although the equipment itself was quite cheap, the transcription process was not. Nevertheless, in the 1980s, transcripts were crucial because searching through cassettes was a cumbersome task and cassettes themselves were not permanent (i.e., tapes get damaged). Hence, producing a transcript was an essential step in translating recordings into searchable and analysable documents. To this effect, transcription techniques evolved and were refined to include as much information as possible in transcripts. Many notation systems were developed;

The invention of digital recorders made the transcript method even better for several reasons. First, digital files do not get damaged with time and backups are easily stored to ensure the integrity of the files. Thus, digital recorders provide unlimited "replayability." Second, software developed for digital sound files makes it easier to jump through interviews when searching for a specific excerpt. Hence, transcripts based on digital files allow for the data to be retrieved and examined in a more flexible manner (Heritage, 1984; Lapadat & Lindsay, 1999). Moreover, the accessibility of digital files means that recorded data can be reused and reanalysed in the context of another study because "the original data are neither idealized nor constrained by a specific research design or by reference to some particular theory or hypothesis" (Heritage, 1984)

Although Fasick (1977) originally doubted the usefulness of transcripts, they are now used extensively (Davidson, 2009), with a wide range of possibilities as to how transcripts are produced whether the transcript is naturalised (writing that reflects words being said) or denaturalised (writing that reflects ideas being said) (Bucholtz, 2000). This is so, because transcripts have several advantages over field notes, one of which is the possibility of accessing, to a certain extent, the event itself in much more detail than field notes. As explained by Duranti *International Journal of Qualitative Methods* 2012, 11(4) 450 (1997), the ability to stop the flow of discourse allows researchers to focus on details, such as hesitations, restarts, and cut-offs in participants' speech (see also Hamo et al., 2004; Heritage, 1984; Silverman, 1993). Moreover, transcripts help prevent infatuation with the field, which occurs when researchers become too close to participants and their world, by providing physical and emotional distance between the researcher and the field (Hamo et al., 2004). Transcripts are therefore "an essential corrective to the limitations of intuition and recollection" (Heritage, 1984, p. 238). In short, transcripts are more complete and more reliable than field notes (Lapadat & Lindsay, 1999).

Transcripts, however, are not a perfect solution and have some problems such as cost and time as mentioned above (Fasick, 1977; Lapadat & Lindsay, 1999). Indeed, the amount of time required to produce transcripts is fairly important (Bertrand et al., 1992), and for every

hour of taped interview, 6-7 hours of transcription is required (Britten, 1995). This time delay between the interview and the production of transcripts is a problem because it slows the progression of the research (Tilley, 2003).

- **PARTICIPANT OBSERVATION:**

Participant observation is in some ways both the most natural and the most challenging of qualitative data collection methods. It connects the researcher to the most basic of human experiences, discovering through immersion and participation the hows and whys of human behavior in a particular context. Such discovery is natural in that all of us have done this repeatedly throughout our lives, learning what it means to be members of our own families, our ethnic and national cultures, our work groups, and our personal circles and associations. The challenge of harnessing this innate capability for participant observation is that when we are participant observers in a more formal sense, we must, at least a little, systematize and organize an inherently fluid process. This means not only being a player in a particular social milieu but also fulfilling the role of researcher—taking notes; recording voices, sounds, and images; and asking questions that are designed to uncover the meaning behind the behaviors. Additionally, in many cases, we are trying to discover and analyze aspects of social scenes that use rules and norms that the participants may experience without explicitly talking about, that operate on automatic or subconscious levels, or are even officially off limits for discussion or taboo. The result of this discovery and systemization is that we not only make ourselves into acceptable participants in some venue but also generate data that can meaningfully add to our collective understanding of human experience.

Participant observation is used across the social sciences, as well as in various forms of commercial, public policy, and nonprofit research. Anthropology and sociology, in particular, have relied on participant observation for many of their seminal insights, and for most anthropologists and many sociologists, doing a participant observation study at a field site is an important rite of passage into the discipline. Bronislaw Malinowski's (1922) work among the Trobriand Islanders is not only one of the foundational works of ethnography, but it is also one of the earliest to both exemplify and articulate the value of participant observation. Sociologists also conducted participant observation studies and discussed the use of the technique early on, including Beatrice Webb (1926) in the 1880s and the Chicago school of urban sociologists in the 1920s (Park, Burgess, & McKenzie, 1925).

THE ROLE OF PARTICIPANT OBSERVATION IN THE RESEARCH PROCESS:

The most traditional use of participant observation is at the exploratory stages of the research on a new topic, culture, venue, or behavior. In these situations, it is hard to beat participant observation for the sheer volume of insight and information that can be collected. Spending time working, playing, or living with people will produce data that would require dozens of interviews or focus groups to uncover. And, as indicated in the example of Koester's IV drug user research, there are often findings that might be completely missed using other methods.

But participant observation can also play an important role when examining topics where there is already a considerable body of knowledge. As with other qualitative methods, participant observation can often help explain quantitative findings by providing the contextual meaning behind other data. In these cases, the participant observation may occur after or at the same time as other forms of data collection, such as analysis of secondary data or a quantitative survey. The participant observation may be used to explain apparent contradictions in other data—as work, to learn the causal relationship behind a numerically observed correlation—or to confirm or gain face validity (sometimes referred to as triangulation) for the findings produced by another research method.

The ability of participant observation to provide explanation, context, causation, and confirmation means that it is often a useful element to include in a mixed method study. As indicated above, the participant observation may occur at multiple stages of the research—either early on as an exploratory element or later as an explanatory or confirmatory element.

3.1 APPLICATION OF QUALITATIVE RESEARCH TECHNIQUES: STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES; SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OF ANY SECTOR.

STAKEHOLDER ANALYSIS

Stakeholder analysis is an extremely useful technique for identifying, understanding, and prioritizing all stakeholders who may wield influence or power over a business or project.

Among other things, analyzing stakeholders will reveal who they are, what their needs and expectations may be, and what issues matter to them (and to what degree). Just as importantly, this exercise will tell you their true level of interest and/or influence over your project.

A thorough analysis will ensure that all affected parties are duly considered. Having access to this knowledge can greatly improve the outcomes of conflict resolution. It can also make your day-to-day [stakeholder engagement](#) efforts much more targeted.

Why analyse stakeholders?

Not all stakeholders deserve the same amount of attention.

This is why conducting stakeholder analysis is so beneficial. It allows you to properly identify all stakeholders and to categorize them in order of importance as it pertains to your efforts to secure social acceptance and ensure successful project delivery.

More specifically, this analysis will tell you the interests of all stakeholders who may impact or be impacted by the project, the attributes of project advocates and opponents, as well as the interrelationships and interfaces that exist between them.

In other words, it will tell you how these different groups interact and how this interaction may be serving or jeopardizing your interests.

During your stakeholder analysis, you'll also uncover any potential risks, issues or misunderstanding that could disrupt the project. This information is vital for knowing what type of communication and messaging will best help to minimize perceived negative impacts and amplify positive impacts.

Stakeholder analysis will identify who exactly you should be engaging, informing and/or encouraging to participate during the project's execution phase – and to what extent.

This valuable information should serve as the foundation for your stakeholder management strategy and messaging. When performed on an ongoing basis, stakeholder analysis will also tell you how your key stakeholder groups are changing over time – in terms of who they are, how their needs or expectations may be evolving, and how your relationship with them has improved – or deteriorated.

This article explores the different types of stakeholder analysis, what elements they have in common and what the benefits of conducting ongoing stakeholder analysis are. (Hint: It has to do with classifying stakeholders based on their influence and power and then understanding their motivations so that you can prioritize your efforts and resources accordingly to achieve the desired outcomes).

How to identify stakeholders?

Stakeholders can be identified in a number of ways:

Team brainstorming: The idea here is to come up with the longest possible list of potential stakeholders. Not all suggestions will be retained but reserve judgment for the end. It's better to weed out than to overlook.

Team members' experience: Chances are your team has built up valuable knowledge over time, so be sure to tap into it.

Historical data: Your organization may have accumulated piles of data from previous projects. Using this data to inform your stakeholder analysis simply makes sense as it promotes efficiency and building on experience.

Comparable: Sometimes you'll be operating in a new location or on a different type of project. Whenever possible, look for similar projects and identify stakeholders who may have played a key role. Chances are the same types of stakeholders will impact (or be impacted by) your current project.

The more approaches you use, the less likely you are to overlook key stakeholders

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME:

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats, and so a SWOT Analysis is a technique for assessing these four aspects of your business.

You can use SWOT Analysis to make the most of what you've got, to your organization's best advantage. And you can reduce the chances of failure, by understanding what you're lacking, and eliminating hazards that would otherwise catch you unawares.

Better still, you can start to craft a strategy that distinguishes you from your competitors, and so compete successfully in your market.

SWOT Analysis:

A parameter to examine the growth and performance of women entrepreneurs development in India.

STRENGTH

- Women entrepreneur can be defined as a confident, innovative and creative women capable of achieving self economic independence individually or in collaboration, generate employment opportunities for others through initiating, establishing and running the enterprise by keeping pace with her personal, family and social life.
- Women prefer to work from their own residence, difficulty in getting suitable jobs and desire for social recognition motivates them self-employment.

Weaknesses

- Absence of proper support, cooperation and back-up for women by their own family members and the outside world people force them to drop the idea of excelling in the enterprise field.
- Women's family obligations also bar them from becoming successful entrepreneurs in both developed and developing nations.
- Achievement motivation of the women folk found less compared to male members. • The greatest deterrent to women entrepreneurs is that they are women.

Opportunity

- Women inculcate entrepreneurial values and involve greatly in business dealings.
- Business opportunities that are approaching for women entrepreneurs are eco- friendly technology, Bio-technology, IT enabled enterprises, event management, tourist industry, Telecommunication, Plastic materials, Mineral water, Herbal & health care, Food, fruits and vegetables processing.
- Women entrepreneurs avail new opportunities in the rural areas such as Ice cream, channel products, papads and pickles and Readymade garments.

Threats

- Fear of expansion and Lack of access to technology
- Lack of self-confidence, will power, strong mental outlook and optimistic attitude amongst women creates a fear from committing mistakes while doing their piece of work.

- Credit discrimination and Non Cooperative officials.
- Insecure and poor infrastructure and Dealing with male labourers. • Indian women give emphasis to family ties and relationships.

3.2 APPLICATION OF STATISTICAL TECHNIQUES IN DEMOGRAPHIC DATA ANALYSIS: POPULATION COMPOSITION, OCCUPATIONAL STRUCTURE, DEPENDENCY RATIO, & MEASUREMENT OF MIGRATION BASED ON CENSUS.

POPULATION COMPOSITION

Population Composition Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

AGE SEX STRUCTURE

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

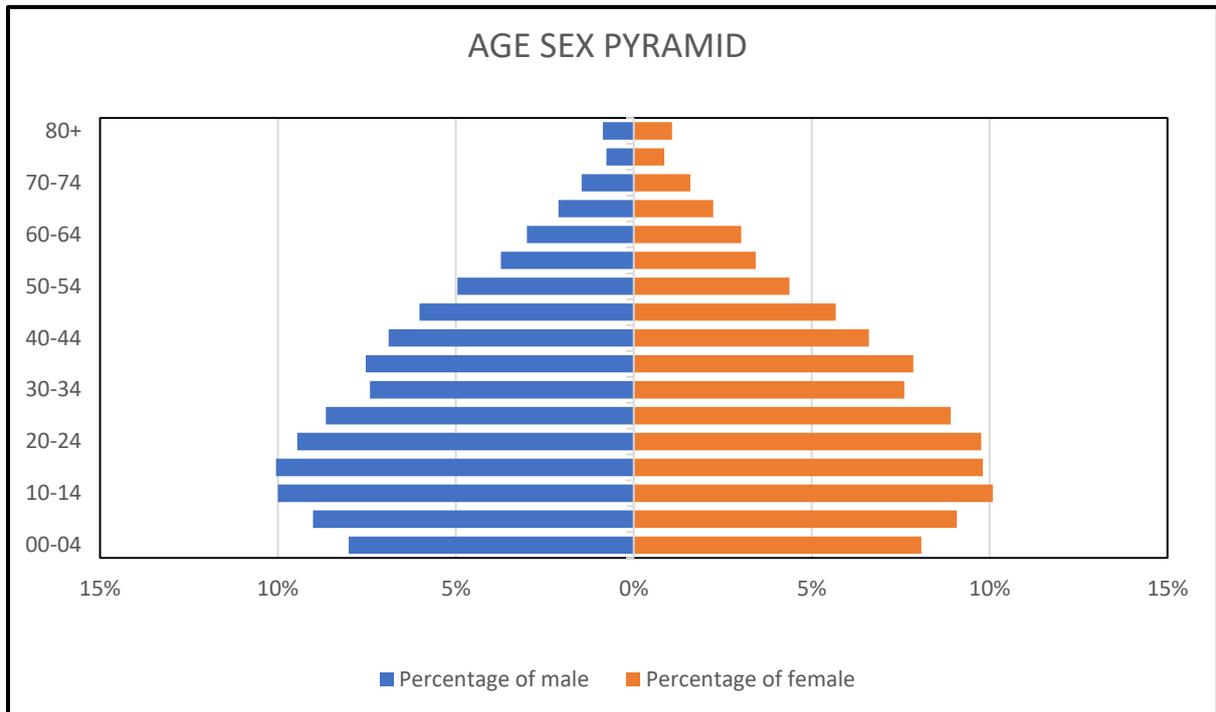
SEX RATIO

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males

POPULATION PYRAMID

The Sex Ratio Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

Age Group	Male	Female	Total	Percentage of male	Percentage of female
00-04	37,43,862	35,89,281	73,33,143	-8%	8%
05-09	42,16,763	40,31,046	82,47,809	-9%	9%
10-14	46,77,506	44,79,017	91,56,523	-10%	10%
15-19	47,02,325	43,55,706	90,58,031	-10%	10%
20-24	44,22,630	43,35,692	87,58,322	-9%	10%
25-29	40,44,904	39,53,005	79,97,909	-9%	9%
30-34	34,64,659	33,76,931	68,41,590	-7%	8%
35-39	35,23,361	34,89,285	70,12,646	-8%	8%
40-44	32,19,604	29,33,456	61,53,060	-7%	7%
45-49	28,14,212	25,21,507	53,35,719	-6%	6%
50-54	23,17,232	19,40,648	42,57,880	-5%	4%
55-59	17,46,903	15,21,747	32,68,650	-4%	3%
60-64	14,06,401	13,39,053	27,45,454	-3%	3%
65-69	9,91,280	9,91,713	19,82,993	-2%	2%
70-74	6,86,881	7,03,726	13,90,607	-1%	2%
75-79	3,60,216	3,79,551	7,39,767	-1%	1%
80+	4,06,536	4,77,025	8,83,561	-1%	1%
Total	4,67,45,275	4,44,18,389	9,11,63,664		



OCCUPATIONAL STRUCTURE

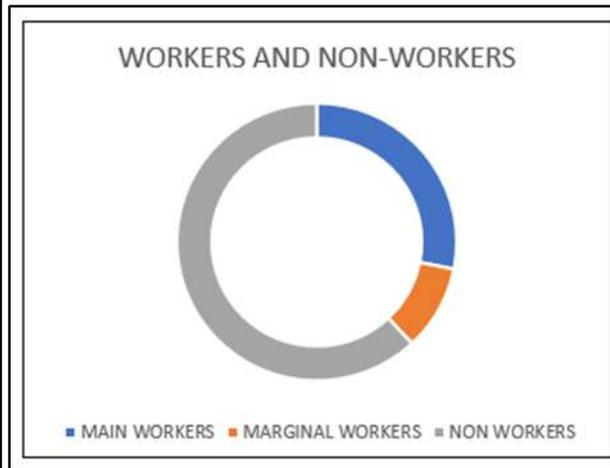
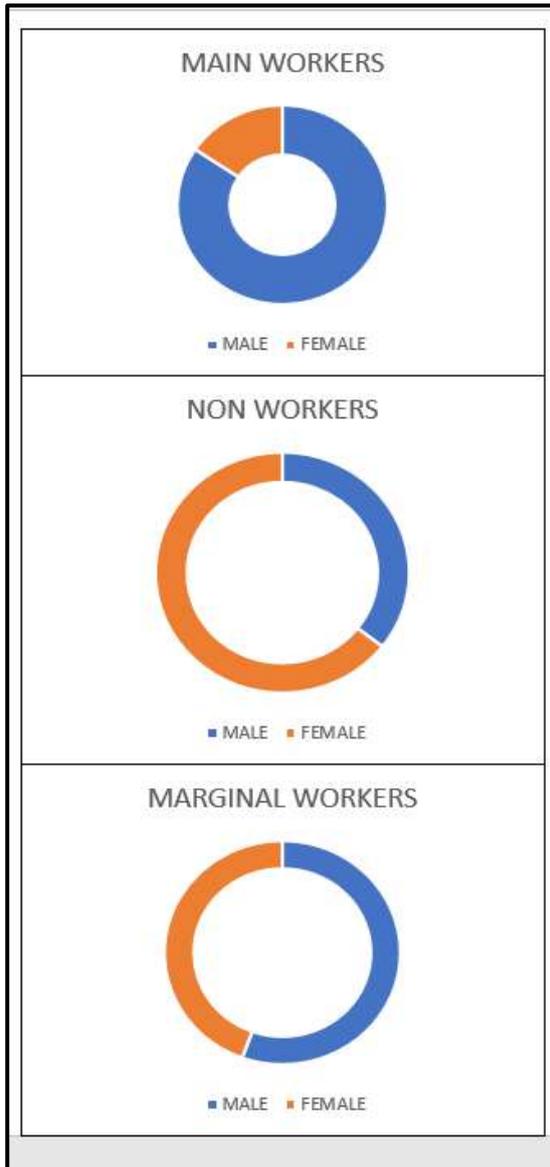
The occupational structure of a nation refers to the percentage of its workforce employed in various economic ventures. To put it in other words, articulating the number of the total working population employed in agriculture and associated activities and the number of them involved in the manufacturing and service sectors can be identified from the occupational structure of the nation.

SIGNIFICANCE

- It reflects the close relationship between economic development and occupational structure.
- It gives proper illustration of ratio and spatial distribution of working and non-working population.
 - This relevant data have its own utility and role in policy making
 - The proportion of workers engaged in various occupation highlights economic and cultural development.
- The significance of occupational distribution of population of a region lies in the fact that, it clearly reveals the socio-economic characteristics of the people living that particular region. It is, hence, one of the important measures of socio-economic development of the country.

OCCUPATIONAL STRUCTURE OF KOLKATA (WEST BENGAL, CENSUS 2011)

WORKERS AND NONWORKERS			
	MALE	FEMALE	TOTAL
MAIN WORKERS	21678279	4008351	25686630
MARGINAL WORKERS	5037768	4031957	9069725
NON WORKERS	20092980	36426780	56519760

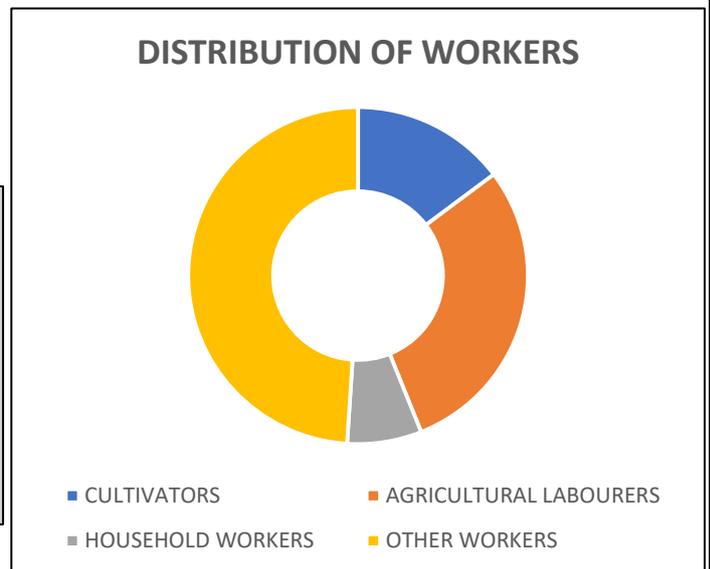


INTERPRETATION

We have shown occupational structure of Kolkata (census 2011) by these three-pie diagram. These diagrams have shown proportion of main workers, non-workers and marginal workers. The proportion of male workers are higher than the females in main and marginal working groups and number of females are high in non-working groups. In another pie the proportion of marginal working population is lower than main and non-working population.

CATEGORY OF WORKERS (MAIN & MARGINAL) (WEST BENGAL, CENSUS 2011)

	MALE	FEMALE	TOTAL
CULTIVATORS	4500041	616647	5116688
AGRICULTURAL LABOURERS	7452814	2736028	10122842
HOUSEHOLD WORKERS	1114683	1349441	2464124
OTHER WORKERS	13648509	3338192	16986701



INTERPRETATION

We have shown category of workers (main & marginal workers) of Kolkata (census 2011) these pie diagram. These diagrams have shown proportion of cultivators, agricultural labourers, household workers & other workers. The proportion of others workers are higher than the cultivators, agricultural labourers and household working groups. The proportion of household workers are lower than the cultivators, agricultural labourers and others working groups.

INDUSTRIAL COMPOSITION, NORTH INDIAN STATES , 2001

STATES/UNION TERRITORY	CULTIVATORS	AGRICULTURAL LABOURERS	HOUSEHOLD INDUSTRY	OTHERS WORKERS
ASSAM	39.1	13.2	3.6	44
MEGHALAYA	48.1	17.7	2.2	32
MANIPUR	40.2	12	10.3	37.6
MIZORAM	54.9	5.7	1.5	37.9
NAGALAND	64.7	3.6	2.6	29
TRIPURA	27	23.8	3	46.1
ARUNACHAL PRADESH	57.8	3.9	1.3	37
SIKKIM	49.9	6.5	1.6	42
TOTAL	381.7	86.4	26.1	305.6

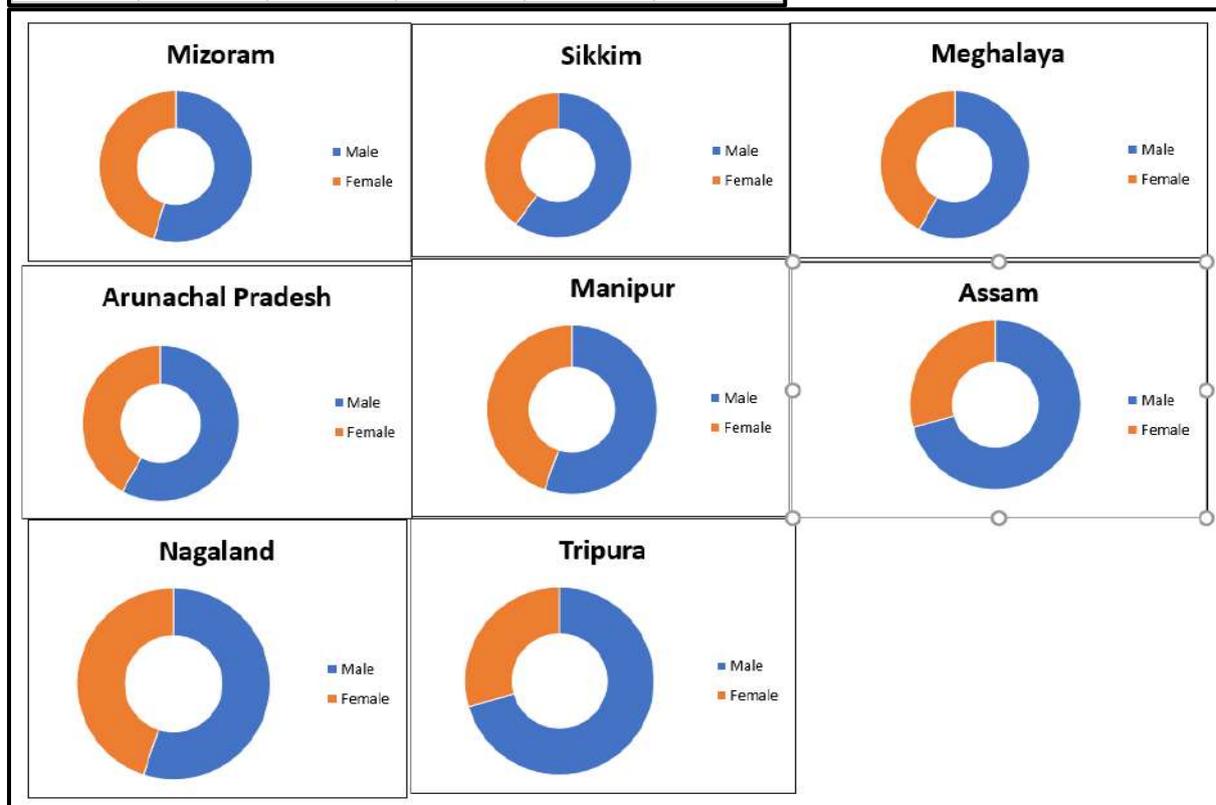


INTERPRITATION

We have shown industrial composition of North Indian States in 2001 by these pie-diagram. These diagrams have shown proportion of cultivators, agricultural labourers, household workers & other workers. The proportion of cultivators are higher than agricultural labourers, household workers & other workers in Mizoram, Nagaland, Meghalaya, Sikkim & Arunachal Pradesh. In another pie the proportion of other workers are higher than cultivators, agricultural labourers & household workers in Tripura & Assam. In another pie the proportion of cultivators and other workers are equal than agricultural labourers & household workers in Manipur.

WORK PARTICIPATION RATE NORTH-EASTERN STATES OF INDIA (2001)

India: Work Participation Rate North-Eastern States (2001)				
State	Male	Female		
Mizoram	57.3	47.5		
Sikkim	57.4	38.6		
Arunachal	50.6	36.5		
Manipur	48.1	39		
Nagaland	46.7	38.1		
Meghalaya	48.3	35.1		
Tripura	50.6	21.1		
Assam	49.9	20.7		
Total	408.9	276.6		



INTERPRETATION

We have shown work participation rate of North-Indian States in 2001 by these pie-diagram. These diagrams have shown proportion of male & female person. The proportion of male person are higher than female person in North-Eastern States.

DEPENDENCY RATIO

The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

The total (or Age) dependency ratio is the ratio of the sum of the population aged 0-14 and that aged 65+ to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

The child dependency ratio is the ratio of the population aged 0-14 to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

The old-age dependency ratio is the ratio of the population aged 65 years or over to the population aged 15-64, presented as number of dependants per 100 persons of working age (15-64).

In published international statistics, the dependent part usually includes those under the age of 15 and over the age of 64. The productive part makes up the population in between, ages 15-64. It is normally expressed as a percentage:

$$\begin{aligned} \text{(Total) Dependency ratio} = & \text{[(number of people aged 0 to 14} \\ & \text{+(number of people aged 65} \\ & \text{and over)/ number of people aged} \\ & \text{15 to 64]} *100 \end{aligned}$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. This results in direct impacts on financial expenditures on things like social security, as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and the aged dependency ratio :

$$\begin{aligned} \text{Child dependency ratio} = & \text{[number of people aged 0 to 14 /} \\ & \text{Number of people aged 15 to 64]} \\ & *100 \end{aligned}$$

$$\begin{aligned} \text{Aged dependency ratio} = & \text{number of people aged 0 to 14} \\ & \text{Number of people aged 15 to 64} \\ & *100 \end{aligned}$$

Age Group	Male	Female	Total					
00-04	37,43,862	35,89,281	7333143					
05-09	42,16,763	40,31,046	8247809	24737475				
10-14	46,77,506	44,79,017	9156523					
15-19	47,02,325	43,55,706	9058031		40.26986			
20-24	44,22,630	43,35,692	8758322					
25-29	40,44,904	39,53,005	7997909					
30-34	34,64,659	33,76,931	6841590					
35-39	35,23,361	34,89,285	7012646	61429261				47.69168
40-44	32,19,604	29,33,456	6153060					
45-49	28,14,212	25,21,507	5335719					
50-54	23,17,232	19,40,648	4257880			47.69168		
55-59	17,46,903	15,21,747	3268650					
60-64	14,06,401	13,39,053	2745454					
65-69	9,91,280	9,91,713	1982993					
70-74	6,86,881	7,03,726	1390607		7.421821			
75-79	3,60,216	3,79,551	739767	4559170				
80+	4,06,536	4,77,025	445803					
Total	4,67,45,275	4,44,18,389	90725906					

MEASUREMENT OF MIGRATION BASED ON CENSUS DATA

The phenomenon of migration is at the centre of the major challenges of the twenty-first century, as evidenced by the intensity of the international agenda on the issue. Indeed, there has been a multiplication of high-level meetings sanctioned by important resolutions that have emphasized the need for international cooperation in response to migration. The holding of the World Summit on International Migration and Development in New York in September 2006 marks a decisive turning point in the integration of migration into development strategies, policies and programs. 4 www.ins.ne MIGRATION MEASUREMENT Thus, since 2007, a global forum on migration and development has been held annually. Is it also important to underline the Rabat Process (Morocco) as a framework for dialogue on migration, which periodically organizes Euro-African Ministerial Conferences on Migration and Development, the most recent of which held in Rome / Italy on 27 November 2014, adopted a declaration and its annex, the Rome program.

The main objective of this presentation is to describe the different measures of migration by

1. Population of Madras, 1951 = p_t =	1,416,056
2. Population of Madras, 1961 = p_{t+1} =	1,729,141
3. Increase in population, 1951-1961 = (2) – (1) =	313,085
4. Number of births in Madras, 1951-1961 = B =	653,190
5. Number of deaths in Madras, 1951-1961 = D =	371,286
6. Natural increase in Madras, 1951-1961 = (4) – (5) =	281,904
7. Net migration to Madras, 1951-1961 = (3) – (6) =	31,181

SOURCE: The population figures are taken from *Census of India*, vol. IX, *Madras*, part II-A. The figures of births and deaths are taken from *Vital Statistics of India, 1962*, issued by the Registrar General, India.

reviewing the definitions and concepts as well as the difficulties associated with studies on migration and migration typologies.

Measurement of migration:

Cross sectional measures : migration rates-

- Let M be the number of migrations (inputs and outputs) observed in a population over a period of n years in a region i.
- Let P_0 et P_n be the population at beginning and en of period.
- The gross migration m is given by :

$$m = \frac{M}{\frac{n}{2}(P_0 + P_n)} \quad k$$

$k = 100, 1000$ ou 10000

- In the same way, the gross emigration rate (or exit index) of an area i is calculated :

$$m_{ia} = \frac{M^{ai}}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

- In the same way, one calculates the gross rate of immigration (or index of entry) of a zone i :

$$m_{ai} = \frac{M^{ai}}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

longitudinal measures : mobility quotient-

- The net rate of migration

$$m_{ai} - m_{ia} = \frac{M^{ai} - M^{ia}}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

- Emigration quotient

$$e_x = \frac{E_x}{S_x + \frac{I_x - D_x}{2}}$$

ex = quotient of emigration at the exact age x

Sx = survivor at exact age x

Ex = emigration at the end o age x

I x = Immigration at the correct age x

Dx = Deaths at full age x

Indirect measures of mobility-

- natural movement method : This method make it possible to estimate the number of migrants.
- For net migration by age the formula gives :

$$P_{i(x)}^t = P_{i(x)}^0 + N_{i(x)} - D_{i(x)} + M_{ai(x)} - M_{ia(x)}$$

- The net balance of international migrants can therefore also be calculated if the number of international migrants is available through this formula:

$$M_{ai(x)} - M_{ia(x)} = P_{i(x)}^t - P_{i(x)}^0 - N_{i(x)} + D_{i(x)}$$

3.3 APPLICATION OF GIS AND RS : PREPARATION OF LAND USE MAP USING OPEN SOFT WARE , MAPPING OF HUMAN HABITATION AND DETECTION OF CHANGE FROM MULTI-DATED MAPS AND IMAGE

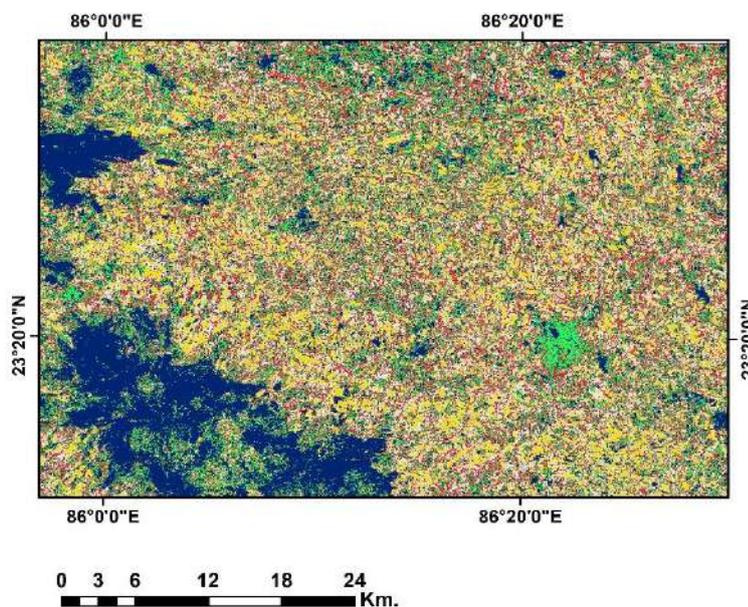
LAND USE MAPPING

City planners need to know which areas of a city are used for which purpose. Therefore, they produce a map of "land use", that identifies parts of a city and the major activities (land use) that happen there. Remote sensing imagery is very useful for this purpose, since you certainly don't want to spend many weeks or months walking or driving around a city to map its land use. But to use remote sensing imagery effectively, you have to be able to interpret it accurately.

The satellite image in this activity shows a part of downtown Montreal. It will be a bit harder to interpret this black and white image, because you don't have colour clues to rely on. But you can see quite a bit of spatial detail - even individual streets and large buildings.

Rowid	VALUE	COUNT	Area	Landuse_units
0	1	115271	4.349641	Settlement
1	2	406199	15.32753	Reservoir
2	3	554870	20.93749	Vegetation
3	4	660826	24.93564	Marshy Land
4	5	912961	34.44971	Agricultural land
		2650127	100	

Preparation of a simple landuse map



Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

INTERPRETAION:

This is a landuse map of ,and there latitudinal and longitudinal extention are 86 0' e and 86 20'e and 23 20n. In this landuse map a huge percentage of land is used as agricultural land about 34.44971%,24.93564% of marshy land, 20.93749% of vegetation cover and 15.32753% of reservoir and only 4.34% land used for settle ment purpose.

MAPPING OF HUMAN HABITATION AND DETECTION OF CHANGE FROM MULTIDATED MAPS AND / OR IMAGES

Calculation for human habitation change from (1984-2020)

Settlement area of 2020 - settlement area of 1984

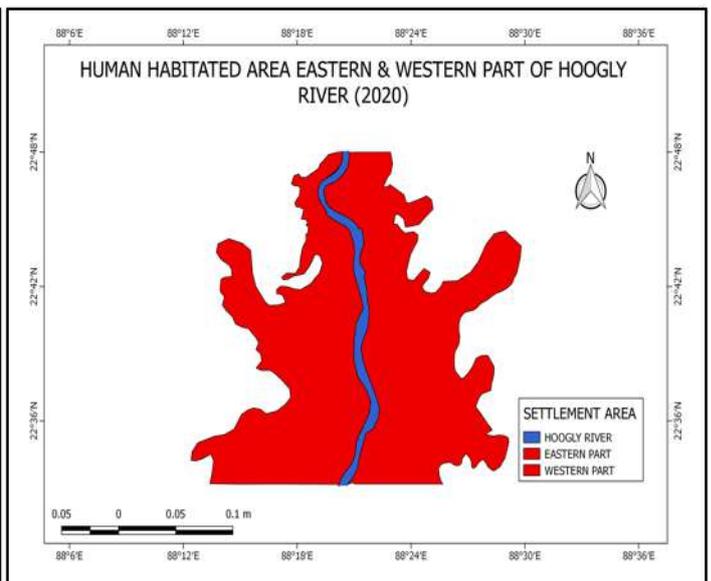
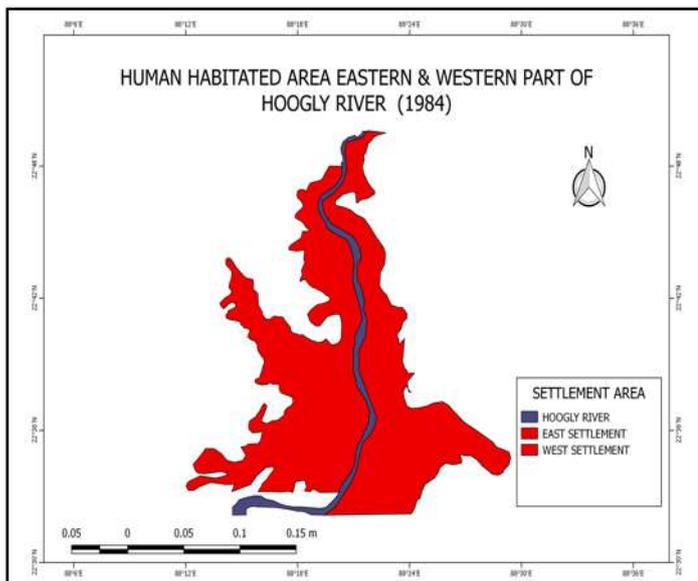
Settlement area of 1984

***100**

$$\text{EAST} = \frac{1.283589 - 2.142077}{1.283589} * 100$$

$$\text{WEST} = \frac{1.708509 - 1.883469}{1.708509} * 100$$

HABITAT CHANGE IDENTIFICATION ON THE BANKS OF RIVER HOOGLY (1984-2020)



INTERPRETATION:

Here we have prepared two thematic maps which shows the comparative analysis of habitation of two sides of Hooghly river between 1984 and 2020. The settlement density in the eastern part of Hooghly river was sq.km in 1984, it has changed about 66.88% in the past 4 decades. Where as in the same period of time the settlement density in the western part of the Hooghly river has changed only 10.24% .

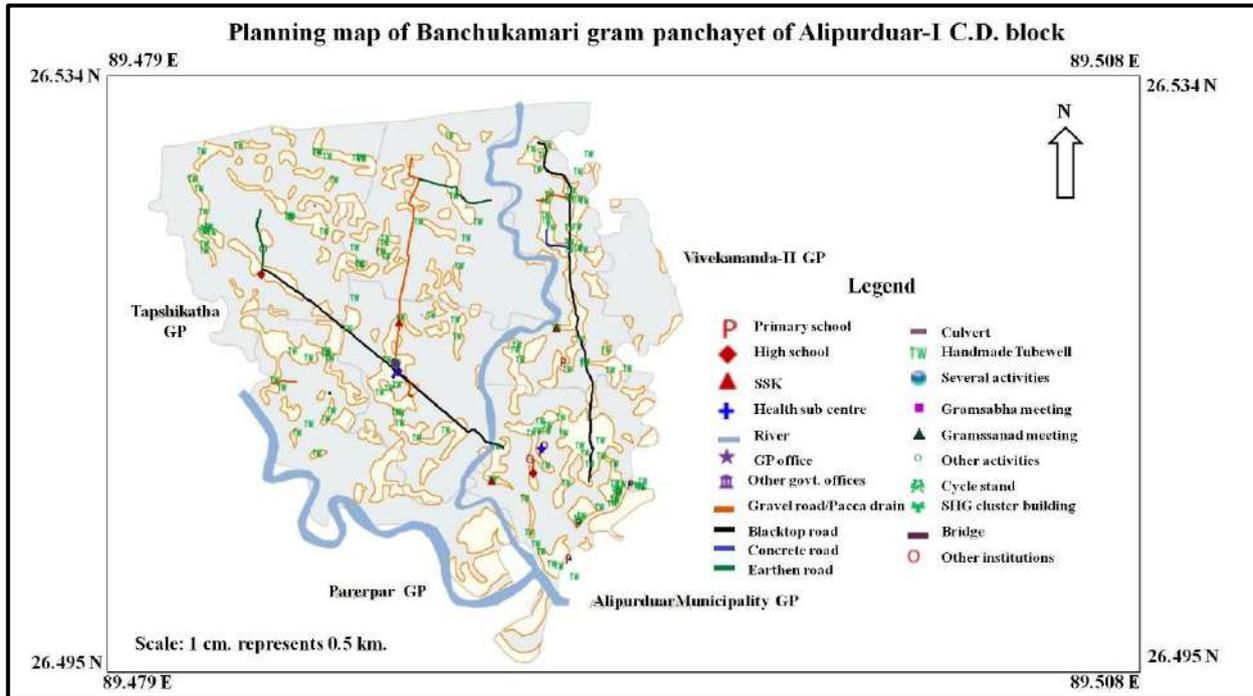
	1984	2020
EAST BANK	1.283589912	2.142077
WEST BANK	1.708509	1.883469

3.4 SPATIAL PLAN FORMULATION AND LAYOUT FOR A VILLAGE PLANNING MAP BASED ON THE ABOVE TECHNIQUES AND ON AVAILABLE INFORMATION FROM PRI

SPATIAL PLAN FORMULARION:

The use of the term spatial planning to describe the activities, processes, practices and the accompanying legal and institutional milieu described in this book is quite recent. Since its inception, the activity of planning has been known and continues to be known by other related terminologies including: 'land use planning', 'physical planning', 'urban planning', 'town and country planning', 'regional planning' and even just 'planning'. As we will show shortly, just as societies in general continue to evolve and the prevailing socio-environmental and economic challenges of the day continue to assume different degrees of complexity, so has planning, which seeks to confront these complex challenges evolved in terms of the underlying theories and the nature and scope of the activities associated with it in practice. In general, the nature and scope of planning within any given society, indicative of the terminology used, reflect the priorities of that society, which in turn determine the focus and core functions embraced by the activity. In some instances, the terminologies used also indicate the spatial scale (i.e. whether town, city, regional or national level) at which the activity of planning is undertaken. With this recognition at the background, we will in the sections that follow, review the meanings of some of these terminologies, learning in the process why we have come to use the term spatial planning.

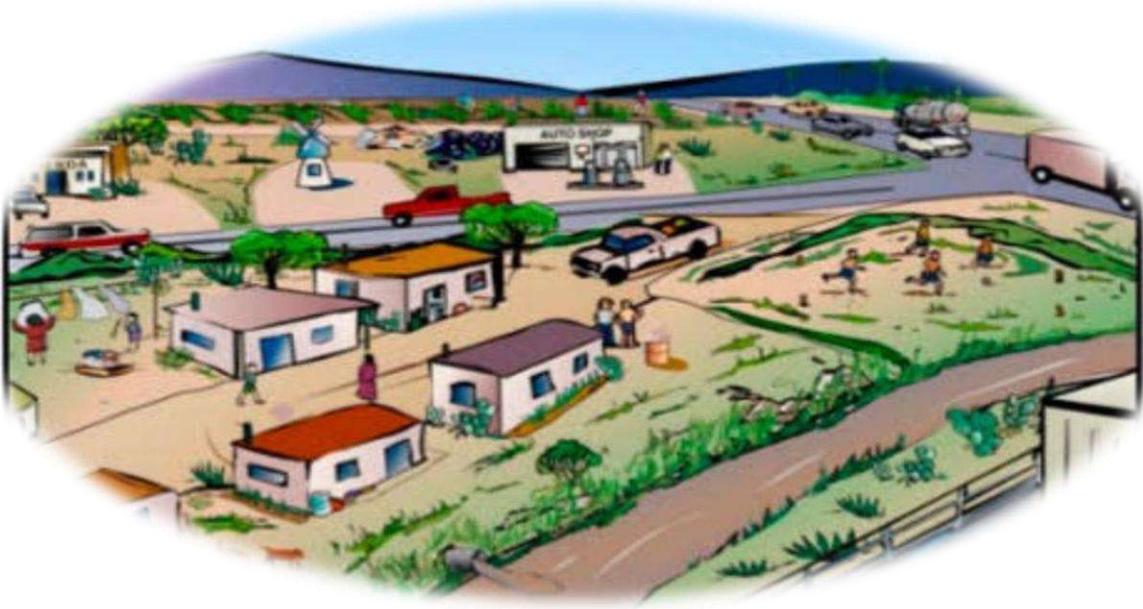
VILLAGE PLANNING BASED ON THE ABOVE TECHNIQUES:



INTERPRETATION:

This is a village planning map of Banchukumari Grampanchayat of Alipurduar-I C-D block. This gram panchayat has a boundary with four other gram panchayat, Vivekananda –II and Alipurduar municipality in the eastern side and Tapshikatha and Parerpar in the western side of this gram panchayat. Four primary schools and two high schools have found in this map. Three Shishu Shiksha kendra, two health sub center situated in this Panchayat. Two Blacktop road, two earthen road, one concrete road has found in this panchayat area.

REGIONAL PLANNING
AND
RURAL DEVELOPMENT



NAME: SUNITA DAS

EXAM ROLL NO: BGC/MGF/SIV/21/311

CLASS ROLL NO: 102

M. SC. SEMESTER 4

PRACTICAL NOTEBOOK

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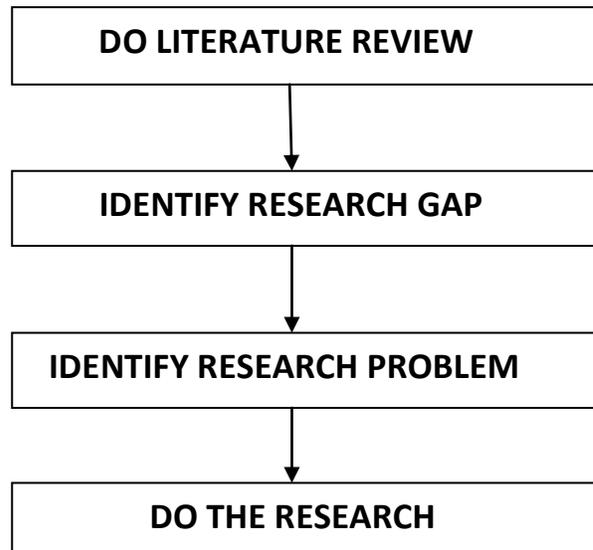
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UNIT 1: RURAL RESEARCH AND METHODOLOGY

1.1: PRE – FIELD ISSUES ON RURAL RESEARCH

LITERATURE SEARCH ON RESEARCH PROBLEM STATED

STEPS TAKEN FOR LITERATURE SEARCH ON RESEARCH PROBLEM



LITERATURE REVIEW: A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe, summarize, objectively evaluate and clarify this previous research.

PURPOSE OF LITERATURE REVIEW: A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should enable you to find out what research has already been done and identify what is unknown within your topic.



FRAMING RESEARCH QUESTION AND HYPOTHESIS

BASIC STEPS:

- IDENTIFY RESEARCH GAP
- SELECTION OF METHOD
- SPECIFIC ASSUMPTION
- TEST THE ASSUMPTION
- END RESULT
- GIVE SUGGESTION

HYPOTHESIS

DEFINITION:

A hypothesis is a precise, testable statement of what the researchers predict and what will be the outcome of the study. This usually involves proposing a possible relationship between two variables: the independent variable (what the researcher changes) and the dependent variable (what the research measures).

In research, there is a convention that the hypothesis is written in two forms, the null hypothesis, and the alternative hypothesis (called the experimental hypothesis when the method of investigation is an experiment).

PURPOSE OF HYPOTHESIS:

A hypothesis should always:

- ❖ Explain what you expect to happen
- ❖ Be clear and understandable
- ❖ Be testable
- ❖ Be measurable
- ❖ Contain an independent and dependent variable

TYPES OF HYPOTHESIS:

ALTERNATIVE HYPOTHESIS

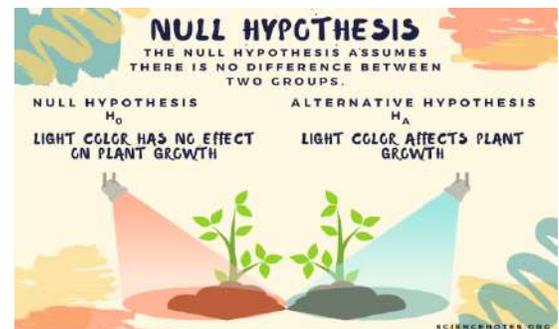
The alternative hypothesis states that there is a relationship between the two variables being studied (one variable has an effect on the other).

It states that the results are not due to chance and that they are significant in terms of supporting the theory being investigated.

NULL HYPOTHESIS

The null hypothesis states that there is no relationship between the two variables being studied (one variable does not affect the other).

It states results are due to chance and are not significant in terms of supporting the idea being investigated.



NON DIRECTIONAL HYPOTHESIS

A two-tailed non-directional hypothesis predicts that the independent variable will have an effect on the dependent variable, but the direction of the effect is not specified.

DIRECTIONAL HYPOTHESIS

A one-tailed directional hypothesis predicts the nature of the effect of the independent variable on the dependent variable

EXAMPLE OF HYPOTHESIS

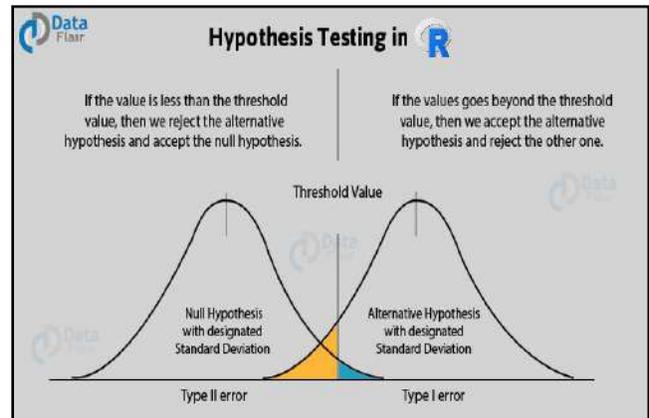
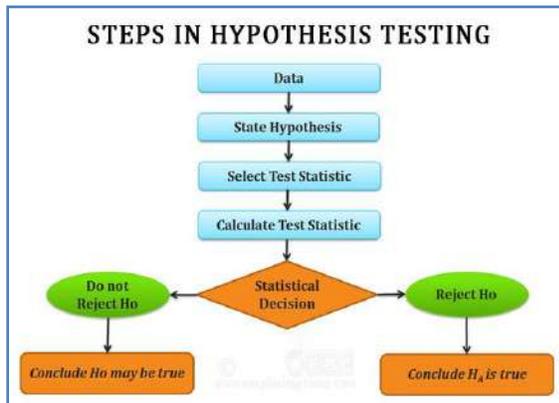
Let's consider a hypothesis that many teachers might subscribe to: that students work better on Monday morning than they do on a Friday afternoon (IV=Day, DV=Standard of work).

Now, if we decide to study this by giving the same group of students a lesson on a Monday morning and on a Friday afternoon and then measuring their immediate recall on the material covered in each session we would end up with the following:

- The **alternative hypothesis** states that students will recall significantly more information on a Monday morning than on a Friday afternoon.
- The **null hypothesis** states that there will be no significant difference in the amount recalled on a Monday morning compared to a Friday afternoon. Any difference will be due to chance or confounding factors.

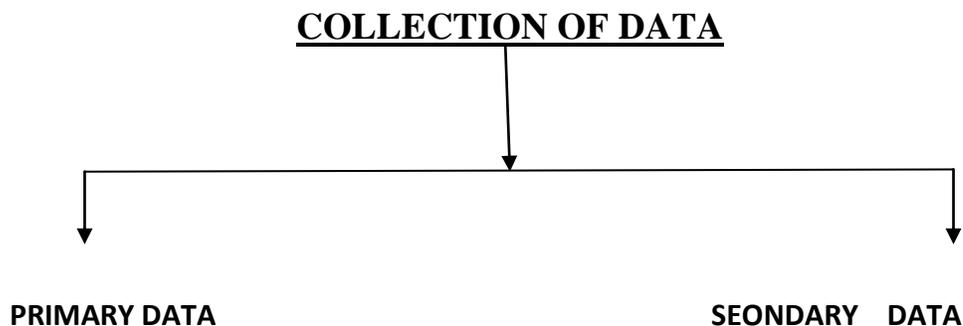
The null hypothesis is, therefore, the opposite of the alternative hypothesis in that it states that there will be no change in behaviour. However, we can never 100% prove the alternative hypothesis. What we do instead is see if we can disprove, or reject, the null hypothesis.

If we reject the null hypothesis, this doesn't really mean that our alternative hypothesis is correct – but it does provide support for the alternative / experimental hypothesis.



STEPS TO SELECT STUDY AREA AND TARGET POPULATION

- Identify the problem of a specific study area.
- See that there is no previous work on that problem.
- Select the problem for mitigation.
- Identify the victimized people.
- Do primary survey.
- Mitigate the problem.
- Do the research.



SECONDARY DATA refers to data that is collected by someone other than primary user.

Common sources of secondary data for social science include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes.

PRIMARY DATA collected by observation, interview, focus group, survey.

PREPARING SURVEY SCHEDULED AND QUESTIONNAIRE

Difference between Questionnaire and Schedule:

The questionnaire was first developed in London in 1838. This is a method of collecting data from respondents through a series of questions. It focuses more on obtaining standardized answers instead of specific answers. There are 7 different types of Questionnaires.

The schedule is another data collection technique containing statements, questions, and blank spaces to fill up the answers given by the respondents to the enumerator or interviewer.



Steps in Making a Questionnaire

- **Identify a theme.** With a theme, you can specify what data needs to be gathered and how these may be acquired in the form of a question.
- **Ask simple questions.** Be as specific as possible. Your respondents need to be able to answer each question without much deliberation.
- **Ask the same question in different ways.** There's always a chance that your respondent may be answering the questionnaire absentmindedly. To assess the reliability of such response, ask the same question several times but in different ways.
- **Choose a delivery method.** If you want to reach a wider audience, you can distribute your questionnaires through various social networks.

1.2: ISSUES ON FIELD RESEARCH

INTRODUCTION

➤ **FIELD RESEARCH:**

Field research is defined as a qualitative method of data collection that aims to observe, interact and understand people while they are in a natural environment. For example, nature conservationists observe behavior of animals in their natural surroundings and the way they react to certain scenarios. In the same way, social scientists conducting field research may conduct interviews or observe people from a distance to understand how they behave in a social environment and how they react to situations around them.

Field research encompasses a diverse range of social research methods including direct observation, limited participation, analysis of documents and other information, informal interviews, surveys etc. Although field research is generally characterized as qualitative research, it often involves multiple aspects of quantitative research in it.

Field research typically begins in a specific setting although the end objective of the study is to observe and analyze the specific behavior of a subject in that setting. The cause and effect of a certain behavior, though, is tough to analyze due to presence of multiple variables in a natural environment. Most of the data collection is based not entirely on cause and effect but mostly on correlation. While field research looks for correlation, the small sample size makes it difficult to establish a causal relationship between two or more variables.

➤ **Methods of Field Research:**

Field research is typically conducted in 5 distinctive methods. They are:

- **Direct Observation:**

In this method, the data is collected via an observational method or subjects in a natural environment. In this method, the behavior or outcome of situation is not interfered in any way by the researcher. The advantage of direct observation is that it offers contextual data on people, situations, interactions and the surroundings. This method of field research is widely used in a public setting or environment but not in a private environment as it raises an ethical dilemma.

- **Participant Observation:**

In this method of field research, the researcher is deeply involved in the research process, not just purely as an observer, but also as a participant. This method too is conducted in a natural environment but the only difference is the researcher gets involved in the discussions and can mould the direction of the discussions. In this method, researchers live in a comfortable environment with the participants of the research, to make them comfortable and open up to in-depth discussions.

- **Ethnography:**

Ethnography is an expanded observation of social research and social perspective and the cultural values of an entire social setting. In ethnography, entire communities are observed objectively. For example, if a researcher would like to understand how an Amazon tribe lives their life and operates, he/she may chose to observe them or live amongst them and silently observe their day-to-day behavior.

- **Qualitative Interviews:**

Qualitative interviews are close-ended questions that are asked directly to the research subjects. The qualitative interviews could be either informal and conversational, semi-structured, standardized and open-ended or a mix of all the above three. This provides a wealth of data to the researcher that they can sort through. This also helps collect relational data. This method of field research can use a mix of one-on-one interviews, focus groups and text analysis.

- **Case Study:**

A case study research is an in-depth analysis of a person, situation or event. This method may look difficult to operate. However, it is one of the simplest ways of conducting research as it involves a deep dive and thorough understanding the data collection methods and inferring the data.

PILOT STUDY BASED ON QUESTIONNAIRE:

The Concise Oxford Thesaurus defines a pilot study as an experimental exploratory, test, preliminary, trial or try out investigation. Pilot test is a trial collection of data to detect weaknesses in design and instrument and provide proxy data for selection of a probability sample. A pilot survey is a mini-survey where the researcher sends out a questionnaire to a smaller sample size compared to the actual target audience. By collecting information from a convenience sample, we can predict the response patterns of participants and make any required changes to our research.

Reasons for Conducting Pilot Study:

The main reasons for conducting a pilot study are:

- **Process:** This assesses the feasibility of the process that are key to the success of the main study
- **Resources:** This deals with assessing time & resource problems that can occur during the main study.
- **Management:** This covers potential human & data management problems.
- **Scientific:** This deals with the assessment of the response, effect & variance of the effect
- **Other Reasons:**
 - Developing & testing adequacy of research instrument
 - Assessing the feasibility of a full scale study /survey
 - Establishing whether the sampling frame & technique are effective collecting preliminary data.
 - Determining what resources are needed for a planned study
 - Assessing the proposed data analysis techniques to uncover potential problems.
 - Developing a research question & research plan.
 - Convincing funding bodies & other stakeholders that the main study is worth supporting.

Advantages of a Pilot Study:

The advantages of a pilot study are:

- It permits preliminary testing of hypothesis that leads to testing more precise hypotheses in the main study. It may lead to changing some hypotheses, dropping some or developing new hypotheses.

- It often provides the researcher with ideas, approaches & clues the researcher may not have foreseen before conducting the pilot study. Such ideas & clues increase the chances of getting clearer findings in the main study.
- It permits a thorough check of the planned statistical & analytical procedures, giving a researcher a chance to evaluate their usefulness to the data. The researcher may then be able to make needed alterations in the data collecting methods & therefore analyze data in the main study more efficiently.
- It can greatly reduce the number of unanticipated problems because the researchers have all opportunity to redesign parts of his/her study to overcome difficulties that the pilot study reveals.
- It may save lot of time & money. The pilot study almost always provides enough data for the researcher to decide whether to go ahead with the main study.
- In the pilot study, the researcher may try out a number of alternative measures & then select those that produce the clearest results for the cleanest results for the main study.
- The less research experience the student has, the more she/he is likely to benefit from a pilot study. Because of that possibility, the student should attempt a pilot study whenever possible.

Problems of Pilot Study:

- Possibility of making inaccurate predictions or assumptions on the basis of pilot data.
- Completing a pilot study successfully is not a guarantee of the success of the full scale survey. Although pilot study findings may offer some indication of the likely size of response rate in the main survey, they cannot guarantee this because they do not have a statistical foundation & are nearly always based on small numbers.
- A further concern is that of contamination. This may arise in two ways :
 - a) Where data from pilot study are included in the main results
 - b) Where pilot study are included in the main study, but new data are collected from these people.
- A more common problem is deciding whether to include pilot study participants in the main study.
- Problems may also arise where a pilot study requires significant investment and resources, making it difficult for the study team or researcher to call a halt to the research after an unsuccessful pilot study.

✚ ETHNOGRAPHIC FIELD DIARY:

Field Diary:

The field diary is the basic document which contains all the data collected. It refers to qualitative notes recorded by researchers in the course of field research, during or after their observation of a specific phenomenon they are studying. The notes are intended to be read as evidence that gives meaning and aids in the understanding of the phenomenon. Field notes allow the researcher to access the subject and record what they observe in an unobtrusive manner.

Ethnographic Field Note/ Diary:

Ethnographic field note is considered the most important field text collection method in qualitative research, and it is basically a primary method of taking field text for an ethnographic study. In fact, an ethnographic research requires more descriptive and interpretive field text analysis about the researched participants focusing on the cultural aspects in a natural setting. The goal of ethnographic research is thus to formulate a pattern of analysis that makes reasonable sense out of human actions within the given context of specific time and place (Fife, 2005). Thus, an ethnographer applies a different method to address the problem of the research. The best approach to collect empirical field text from the field is by writing field notes. Whether an ethnographer conducts formal interviews, informal interviews, observation, focus group discussions, key informant interviews or overheard conversations, writing the field notes is virtually a significant way for the researcher to record the data (Dewalt & Musante, 2010). If the ethnographers do not write it down in their field notes, recording data may not be possible. Thus, the field note writing is the most important means of documenting field data in an ethnographic research.

In order to record as much as possible, it is important to include as much information as possible in your field notes. Chiseri-Strater and Sunstein (1997) have developed a list of useful things that should be included in all field notes:

- Date, time, and place of observation
- Specific facts, numbers, details of what happens at the site
- Sensory impressions: sights, sounds, textures, smells, taste
- Personal responses to the fact of recording fieldnotes
- Specific words, phrases, summaries of conversations, and insider language
- Questions about people or behaviors at the site for future investigation
- Page numbers to help keep observations in order

There are many other methods by which we can record ethnographic field text. Field notes remain a central method in ethnography even though modern technologies such as cameras and audio recorders may seem to be better at capturing information and easier to use (Madden, 2010). An ethnographer could use modern tools and techniques in writing the field note such as Instagram and Vivo. Many would say that typing notes directly into a laptop is now equivalent to handwriting, and they are probably correct (Madden, 2010).

In the 21st century, researchers have been using many gadgets in the research. To be skillful in ethnographic field notes writing using pen and pencil is still significant for the ethnographers. The ethnographers need to see the context of the field, ethical aspect and technical part of the successful field text collection. The aim of the field work is to produce comprehensive field texts that help to produce a reliable thesis. On the other hand, the development countries are also importing modern technology due to the revolution in digital world. As a result the research participants in the developing countries are also aware of the emerging technology. In light of the problems associated with writing field notes, particularly in the context of interviews, the advantages of audio-recording, and perhaps even video-recording, are obvious (Hammersley & Atkinson, 2008). Despite the revolution in the digital technology there are both challenges and opportunities to use them in the research field. Due to the poor knowledge and skill on the use of modern technology the hand written field note method is still significant in research.

LONGITUDINAL STUDY & CASE STUDY RESEARCH:

LONGITUDINAL STUDY:

A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. As longitudinal studies are observational, there will be no interference with the respondents or subjects if it happens to be a survey. They are unique from other types of research because of their timeline. This means that the same subjects are observed multiple times (often in the course of many years), instead of the researchers trying to collect data from various subjects with the aim to study the same variables. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Types of Longitudinal Research:

There are three major types of longitudinal studies:

- **Panel study:** Involves sampling a cross-section of individuals.
- **Cohort study:** Involves selecting a group based on a specific event such as birth, geographic location, or historical experience.
- **Retrospective study:** Involves looking to the past by looking at historical information such as medical records.

Advantages of Longitudinal Studies:

- One key advantage of performing longitudinal studies is their **ability to show patterns of a variable over time**, which is a very powerful way through which researchers come to learn about the relationships of cause and effect.
- With a **clear focus**, longitudinal studies would see how a particular end state or a set of circumstances would come to be. And though people usually might not remember past events, it can be solved by means of actual recording, thus ensuring a high level of **validity**.
- A longitudinal study is unique in itself in terms of its ability to **provide useful data** about individual changes.

- As most longitudinal studies use the observation method (they observe the state of the world without manipulating it), it has been argued that they may have less power in detecting causal relationships than experiments. However, because of the repeated observations they use at individual levels, they have **more power than cross-sectional observational studies** in terms of being able to exclude time-invariant, unobserved individual differences and in terms of observing a certain event's temporal order.
- A longitudinal study is often used in studying **developmental trends** across life spans and in studying life events throughout generations or lifetimes. This is primarily because, unlike a cross-sectional study, in which different individuals with same characteristics are compared, a longitudinal study would track the same people, thus the differences observed in the group will be less likely to be the result of a cultural difference across generations.
- Because they are perfect for doing research on developmental trends, longitudinal studies can make **observation of changes** more accurate, making them a more preferred method in various fields.
- Longitudinal studies allow for **flexibility** to occur, which means their focus can be shifted while data is being collected.

Disadvantages of Longitudinal Studies:

- One of the biggest drawbacks of performing longitudinal studies is **panel attrition**. If you are only depending on the same group of subjects for a study that takes place once in a while for years, some of these subjects will obviously no longer be able to participate due to various reasons, such as refusal, changes in contact information and death, which cuts down useable data that can be drawn for an ultimate conclusion.
- Another huge drawback to any longitudinal study is the great amount of time it needs to collect all the data that is needed. Usually, it **takes a long period of time** to gather results before you can start making patterns.
- They would gather **data that is not that reliable**. While longitudinal data is collected at multiple points, these observation periods are pre-determined and cannot be taken into account no matter what happens between these points. Aside from this, there is also the idea of panel conditioning, where respondents can often unknowingly change their qualitative responses over time to better fit what they consider to be the intended goal of the observer. The process of longitudinal studies itself has changed how subjects or respondents view the questions used.
- They **require a large sample size**. It means that such studies should have a large number of subjects who are willing to cooperate.
- It is known that **cross-sectional studies are more affordable compared to longitudinal studies**. With fewer touch points, the former are also much quicker in reaching an

observational conclusion. Considering they use a carefully chosen sample size, they can be more helpful in representing entire populations, instead of using subsets, which can be very beneficial when it comes to considering a policy change.

❖ **CASE STUDY RESEARCH:**

A case study is an effective research method that specifically studies a single case over a period of time. Case studies are research methodologies that are used and analyzed in order to depict principles. Case studies seek to explain and give details in the analysis of people and events. Writing a case study is a very useful form of study in the educational process.

Characteristics of Case Study Research:

Particularistic Phenomenon: A case study researcher may specifically choose a particular instance of phenomenon under investigation to understand a specific problem that occurs in everyday practice.

Descriptive Phenomenon: Descriptive phenomenon means that the end result of the case study, the narrative, includes 'thick description' of the phenomenon, including many variables and analyses of the interactions.

Heuristic Phenomenon: Heuristic refers to the fact that case studies 'illuminate the readers' understanding of the phenomenon under study' beyond the readers' original knowledge.

Types of Case Study:

There are 4 types of case studies used for different purposes. The main purpose of case studies is to analyze problems within the boundaries of a specific organization, environment, or situation. According to design, case studies can be divided into the following categories:

- **Illustrative Case Study:** An illustrative case study is used to examine a familiar case in order to help others to understand it. It is one of the main types of case studies in research methodology and is primarily descriptive. In this type of case study, usually, one or two instances are utilized to explain what a situation is like.
- **Exploratory Case Study:** An exploratory case study is a primary project conducted before a large scale investigation. These types of case studies are very popular in the social sciences and primarily focus on real-life contexts and situations. Typically, these are used to identify research questions and methods for a large and complex study. The

main purpose of an exploratory case study is to help identify situations for the further research process.

- **Cumulative Case Study:** A cumulative case study is one of the main types of case studies in qualitative research. It is used to collect information from different sources at different times. The aim of this case study is to summarize the past studies without spending additional cost and time on new investigations.
- **Critical Instance Case Study:** Critical instances case studies are used to determine the cause and consequence of an event. The main reason for this type of case study is to investigate one or more sources with unique interest and sometimes with no interest in general. A critical case study can also be used to question a universal assertion.

Types of Subjects of Case Study:

In general, there are four types of case studies and 5 types of subjects they address. Every case study whether exploratory, critical, or cumulative, fits into the following subject categories.

- **Person:** This type of study focuses on one subject or individual and can use several research methods to determine the outcome.
- **Group:** This type of study takes into account a group of individuals. This could be a group of friends, coworkers, or family.
- **Location:** The main focus of this type of study is the place. It also takes into account how and why people use the place.
- **Organization:** This study focuses on an organization or company. This could also include the company employees or people who work in an event at the organization.
- **Event:** This type of study focuses on a specific event. It could be societal or cultural and examines how it affects the surroundings.

Pros & Cons:

There are several pros that back case studies and there are cons too that criticize them. The pros and cons are listed below.

- **Pros:**

- They show client observations-Since case studies are strategies that are used and analyzed in order to describe principles therefore it seeks show indeed the client investigated and experienced a particular phenomenon.
- Makes practical improvements-Case studies present facts that categorically describe particular people or events in order to make some of the necessary improvements. Case studies data is what supports a particular belief.
- They are an influential way of portraying something-If a researcher wants to prove a particular principle to be true, he or she must back it by case studies in order to make the other people and the naysayers believe.
- They turn opinions into facts-Case studies present real data on a particular phenomenon. Since, facts about various things are presented then it can be verified through this kind of data if the information presented is in the positive or negative development of opinion.
- It is relevant to all the parties that are involved-Case studies help the researchers in actively focusing on the data collection process and the participants' knowledge is bettered. At the end of the process, everybody is able to defend his position through facts.
- A number of different research methodologies can be used in case the studies-Case study method goes beyond the interview and direct observations. Secondary data can be obtained from various historical sources that can be used to back the method.
- 7. Case studies can be done remotely-It is not essential for a researcher to be present in the specific location of the study in order to effectively use the case study method. Other forms of communication come in to cover that gap for the researcher.
- 8. It has a very high cost-If you put this research method in comparison to the others, this one seems more expensive because the cost of accessing data is very high.
- 9. Readers can access data from this method very easily-The format in which case studies present their data is very useful to the readers and easily note the outcomes of the same.
- 10. Collects data that cannot be collected by another method- The type of data collected by case studies is much richer and greater in-depth than that of the other experimental methods.

▪ **Cons:**

- Data collected cannot be generalized- The data collected by the case study method was collected from a smaller population it cannot be generalized to the wider population.
- Some of the case studies are not the scientific-The weakness of the data collected in some of the case studies that are not scientific is that it cannot be generalized.
- It is very difficult to draw a definite cause/effect from case studies-The the kind of data that case studies present cannot be used to draw a definite cause-effect relationship.
- Case studies concentrate on one experiment-The problem associated with concentrating on one experiment or a specific group of people is that the data presented might contain some kind of bias.
- It takes a lot of time to analyze the data-This process takes longer to analyze the data because there is a very large amount of data that must be collected. Participants might take a lot of time in giving answers or giving inaccurate information.
- Case studies can be inefficient processes-Sometimes the researchers are not present at the study areas, which means they will not be able to notice whether the information provided is accurate or not terming the whole process inefficient.
- Case study method can only be effective with a small sample size-If a very large sample size is involved in the case study it is likely for it to become inefficient because the method requires a small sample size to get the data and analyze it.
- The method requires a lot of labor in data collection-The researcher is seriously needed in the data collection of this method. They have to be personally involved in order to be able to identify the quality of the data provided.
- There are factors that can influence the data- The method of data collection is meant to collect fact-based data but the power to determine what fact is and what is not is the person who is collecting the data.
- There is no right answer in case studies-Case studies do not present any specific answer that is right, the problem arises in the validation of solutions because there is more than one way of looking at things.

1.3: FIELD TECHNIQUES

✚ PARTICIPATORY RURAL APPRAISAL:

Appraisal	•The finding out of information about problems, needs, and potential in a village. It is the first stage in any project.
Participatory	•Means that people are involved in the process – a “bottom-up” approach that requires good communication skills and attitude of project staff.
Rural	•The techniques can be used in any situation, urban or rural, with both literate and illiterate people.

PARTICIPATORY RURAL APPRAISAL or PRA:

It is considered one of the popular and effective approaches to gather information in rural areas. Participatory Rural Appraisal was first developed in India and Kenya during the 1980s; it has been mainly used by non-governmental organizations (NGOs) working on the grass-root level. This approach was developed in early 1990s with considerable shift in paradigm from top-down to bottom-up approach, and from blueprint to the learning process. PRA is based on village experiences where communities effectively manage their natural resources. PRA is a methodology of learning rural life and their environment from the rural people. It requires researchers / field workers to act as facilitators to help local people conduct their own analysis, plan and take action accordingly. It is based on the principle that local people are creative and capable and can do their own investigations, analysis, and planning. The basic concept of PRA is to learn from rural people.

DEFINITION- CHAMBERS (1992): PRA as an approach and methods for learning about rural life and conditions from, with and by rural people. He further stated that PRA extends into analysis, planning and action. PRA closely involve villagers and local officials in the process.

VARIOUS PRA METHODS:

Transect Walk

- This involves walking with the villagers through the village and discussing about different aspects of land and water in the village during the walk.

- This enables the outsider to observe different aspects of rural environment and helps in getting in-depth information about problems and opportunities as well as their interpretations.
- The walk also reveals view about Natural resources; is it resource rich/poor village?

Seasonal Analysis

- Each season has specific problems and influences on rural life.
- It affects the availability of food, water, fuel, fodder, etc. this influences their living conditions.
- Here, villagers prepare diagrams and charts of socio-economic and physical phenomenon.

Historical Analysis

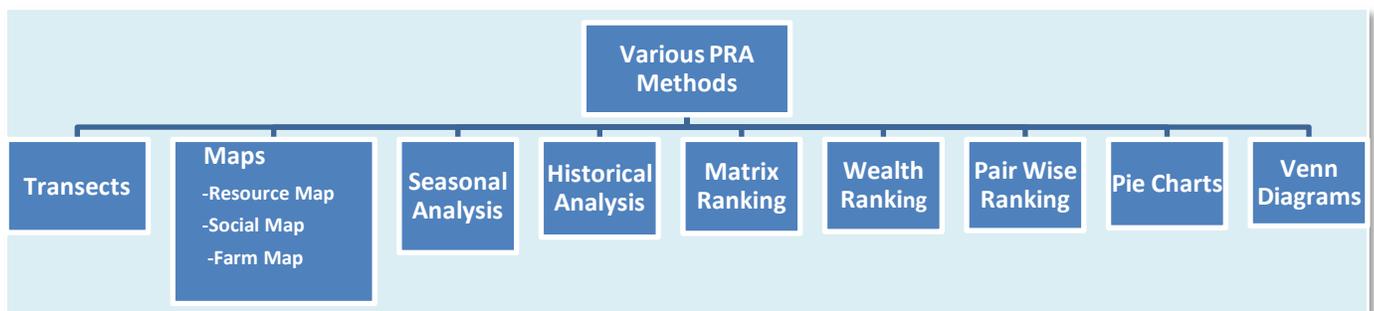
- Various diagramming techniques can help explore changes in: rainfall, labor demand, farming (fishing, hunting, herding) activities, wood supply for fuel, disease incidence, migration for employment, food stocks and many other elements that change over time. The diagrams you produce can be used as a basis for discussions for the reasons behind changes and implications for the people involved.

Matrix Ranking

- Matrix ranking is used to list items to be compared along horizontal line and criteria on the vertical line to rank choices from most important to least important (i.e. 1st, 2nd, 3rd, 4th etc) In this case frequency of the items valued as the 1st choice helps to make up a final decision.

Wealth Ranking

- Wealth ranking is a method to understand relative wealth with in a specific area and



community. It is a method to learn about local criteria of well-being.

- Wealth ranking provides a way to identify information from different social and economic groups to produce a baseline against which future intervention impact can be measured.
- Wealth ranking is a sensitive issue to discuss with every member of the community

Pair-Wise Ranking

- Here, two items are used at a time for ranking and can be used to explore rural people's criteria for choosing one alternative over the other.
- At the end, most favorable choice or problem is identified.

Venn Diagrams

- In this Diagram, circles of different sizes represent an individual or institution whose size shows degree of its importance in decision making.

Maps:

- The purposes of a map or is a visual representation of what the community perceives as their community space.
- This include showing the shape (appearance) of the community, boundary and all the major features as understood and known by the community.
- The map shows where resources, activities, problems and opportunities are located as well as the dimension and scope of issues to be investigated.
 - **Resource Maps**
 - Resource maps are drawn by the people to show natural resource of an area, location and use of natural resources.
 - - fields and land uses
 - - physical land features
 - - water location, quality and use
 - - soil types, uses, location etc.
 - **Social Maps**

- Specific type of map representing households according to certain indicators.
 - - Social Maps Indicates where people live and how many people live in an area
 - - Social and residential differences in status and wealth
 - - Buildings where people live or work, uses of space in a house
- **Farm Maps**
 - It is an idea tool for knowing the details of the farm, soil condition, water management, fertilizer use and yields.
 - A villager is asked to draw a map to show the crop grown on his farm and the location of the farm.

Importance of Participatory Rural Appraisal:

As PRA, basically came into existence in response to the disappointments and the criticism of the assumptions upon which earlier development work of planning and implementation was based, PRA has the added advantage of participation of local people which positively affects the planning, documentation and implementation of a program.

Following are some of the advantages of PRA which makes it important for a program.

- **Target group's real priorities are identified:** In PRA, the target group i.e. local people are asked about the immediate problems, that they are facing. The outsiders do not impose their own solutions on these problems; rather they explore the solutions with the local people in which they are really interested.
- **Delegation of responsibilities:** PRA encourages self-reliant development with most of the responsibilities to manage and execute the developmental activities done by local people. This creates a sense of ownership and enthusiasm among the local people and thus the efficiency to achieve the goal also increases.
- **Motivation of local development workers:** The local development workers of non-governmental organizations, government or other agencies, who are involved in the developmental projects or programs, get motivated through their participation in PRA activities, by knowing the grass-root level problems and priorities of the people. PRA helps to ensure better understanding and commitment of local workers; in return people at administrative and organizational levels also become aware about the requirements and priorities of workers and community.
- **Use of local resources:** PRA encourages participation of the local people and they design the activities by keeping in mind the availability of the resources that are present in

their surroundings. This makes complete use of existing local resources like manpower, time, material resources and others.

- **Sustainable developmental activities:** As local people plan and execute the activities themselves and which are technically, environmentally, socially and financially appropriate to local conditions, which lead to more sustainable developmental activities.
- **Brings desirable behavioural changes:** PRA methods encourage participation by providing visual basis like resource map, which stimulates the thought process and encourages local people to offer their views which are appreciated and included in the activities, increasing their confidence to participate more.
- **Use of indigenous knowledge:** Every community has an indigenous knowledge system which it acquires through work experience and solves problems in its own specific situations. This knowledge is shared by the local people of community while participating in the activities.
- **PRA is also important because:**
 - It provides basic information where little is known.
 - Getting a better picture of needs and ability of the organizations to meet them.
 - Developing and transferring appropriate technologies.
 - Planning projects that are more relevant, restructuring administration, assisting in decision-making and policy formulation.
 - Providing guidelines for survey
 - It helps in individual and collective decision making and problem solving
 - Participation by the proper elements presents the 'Hijacking' of programme benefit selection of the community.

DISADVANTAGES:

- Raising expectations which cannot be realized
- Many a times, the poor or socially backward people may not get properly represented
- Risk of "capture" of activities by local interests
- Failure to take account of stratification in communities

FOCUS GROUP DISCUSSION:

A focus group is best defined as a small group of carefully selected participants who contribute to open discussion for research. A focus group discussion involves gathering people

from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes believes opinion or ideas.

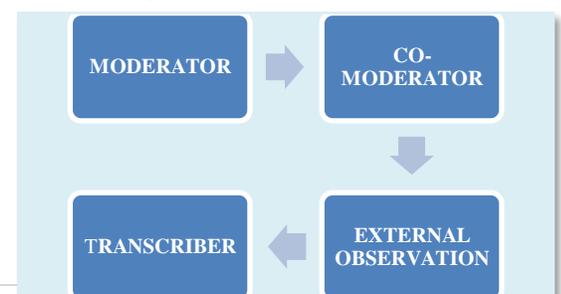
The group's composition and the group discussion should be carefully planned to create a non-intimotating environment so the participants feel free to talk openly and give honest opinions. Since participants are actively encouraged to not only express they are own opinions, but also respond to other members and questions posed by the leader focus groups offer a depth, nuance and variety to the discussion that would not be available through surveys.

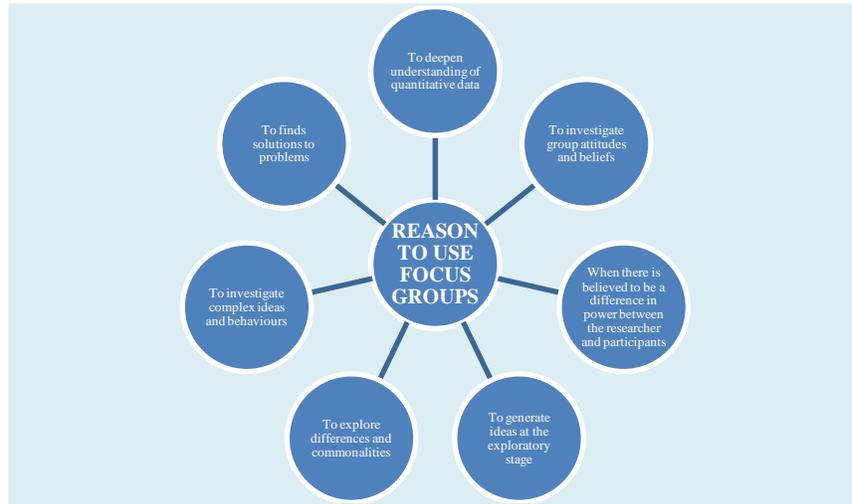
Additionally as focus group discussions are structured and directed, but also expressive, they can yield a lot of information in a relative Lee short time. Therefore, FGDs are a good way to gather in-depth information about a community's thoughts and opinions on a topic. The course of the discussion is usually planned in advance and most moderators rely on an outline, or guide, to ensure that all topics of interest are covered.

Key Features of FGDs:

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic.
- Particularly suited for obtaining several perspectives about the same topic.
- In FGDs, participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants.
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation.
- It generally involves group interviewing in which a small group of usually 8 to 12 people. It is lead by a moderator (interviewer) in a loosely structured discussion of various topics of interest.
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.
- The participants usually have shared social and cultural experiences (such as age, gender, religion, social class etc.) or shared particular areas of concerned (such as divorce, marriage, motherhood, childbirth, infant feeding, nutrition, mental health etc.).

Figure: Team Members of FGDs





Advantages of FGDs:

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents result in generation of new ideas that can be very useful for decision making.
- Focus groups can be relatively low cost and provide quick results. The actual time and cost for planning, conducting and analyzing data may be relatively small when compared to alternative such as survey projects and individual interviews.
- Focus groups are a flexible assessment tool. Interactions between the moderator and participants allowed the moderator to probe issues in depth, address new issues as they arise, and to ask participants to elaborate on their responses.
- Participants may be more comfortable talking in a group than in an individual interview. Interactions can generate more discussion and therefore, more information.
- The data is in the respondents' own words. It is easily understood and will provide insights into how respondents think about the topic.
- It captures real life information in a social environment and it has a high face validity.

Disadvantages of FGDs:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.

- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projection or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.
- The researcher has less control than individual interviews.



1.4: POST FIELD TECHNIQUES

Methods of Report Writing:

A report is a document that presents the results of an investigation, project or initiative. It can also be an in-depth analysis of a particular issues or data set. The purpose of a report is to inform, educate and present options and recommendations for future action. Reports are an integral element of dozens of industries, including science, healthcare, criminal justice, business and academia. Reports typically consist of several key elements, including—

1. Detailed summaries of activities
2. Analysis of the impact of the event
3. Evolutions of the facts and data
4. Predictions for what may happen as a result of an event
5. Recommendation for next course of action
6. Conclusion

Ethnographic field note ----

Ethnographic fieldwork is how anthropologists gather data. Fieldwork is the process of immersing oneself in as many aspects of the daily cultural lives of people as possible in order to study their behaviors and interactions. Ethnography is most useful in the early stages of a user-centered design project. This is because ethnography focuses on developing an understanding of the design problem. Therefore, it makes more sense to conduct ethnographic studies at the beginning of a project in order to support future design decisions. Common ethnographic data collection method are----

1. Participant observation: participant observation is the quintessential fieldwork method in anthropology. Anthropologists use various degrees of participant observation, from full participation in ongoing activities to passive observation within the locations of interest. Participant observation is useful at multiple stages of an evaluation.

- Initially to identify issues that need to be explored with other data collection methods.
- Ongoing as process evaluation.
- Following other types of data collection, to triangulate earlier findings and directly observe the specific phenomena that participants have spoken about.

2. Focus Groups: The focus group is a group interview method useful to obtaining information on relatively unstudied topics for which the full range of relevant domains is not known and the dynamic interaction among participants is of interest. Researchers chose focus groups over individual in-depth interviews when data acquisition will benefit from the dynamic that is created through group discussion. The discussion often elicits information and insights that might not be gained from an individual interview, including the colloquial ways in which participants speak with one another about working in or seeking care from the practice.

AUDIO-VIDEO RECORDINGS:

Audio/video is an observation-recording tool that can be employed by researchers to record, review and analyze user behavior or actions in specific scenarios. Audio/video can be easily combined with other design research methods such as interviews, guided tour, task analysis, to record user experience or interaction with a prototype, a digital or non-digital product and services.

A video is a series of pictures stitched together to give the impression of continuous motion. A video normally comprises of 24-30 frames per second (fps) which means that a 5 – second video shot at 15 fps, is made up of 75 photos (frames). A normal video, which is played back at the same frames per rate as it is recorded, also has an audio component.

In many studies, audio, as well as video, these are recorded to capture a process, interaction or a scenario. In situations where the visual aspect that a video brings is either more expensive to shoot or doesn't add significant value to the study, researchers usually use an audio recording. This recorded data is then analyzed to understand what happened at the time of the recording.

Methods to conduct Audio/ Video analysis research

The equipment required to record the voice memos or videos is a camera (many phone cameras come equipped with time-lapse recording capabilities), a tripod and a remote. This equipment can be set-up in the same scenario with different users or different scenarios with the same users or user groups. The researcher and the videographer can be different. In situations where the researchers presence is either not required or could affect the participant's behavior, an audio/video recording mechanism may be set-up in advance, the media can be recorded during the activity and the researcher can listen or view the recording later.

A number of techniques can be employed to analyze audio and visual data to study the interaction between people, digital and non-digital products and prototypes. The choice of technique depends on what line of inquiry the researcher wishes to take. Both of the audios, as

well as video, data allow researchers to collect and analyze data, and disseminate findings to a wide variety of audiences.

Advantages of Audio/Video Analysis:

- **Large sample sizes:** Audios/videos can be recorded for a large number of individuals at the same time for the same or different scenarios; the only requirement is the equipment accompanying the researcher or independent of the researcher.
- **Researcher presence:** In cases where a senior researcher needs to be present for a certain observation but is unable to attend a session, the session can be recorded for the researcher to review later and document their findings.
- **No researcher influences:** In cases where the recording is done independent of the researcher, the researcher cannot influence the user's behavior or interactions.
- **Missed details:** In cases where the researcher was present during the recording, any details that the researcher could have missed can be reviewed and documented when reviewing the audio/video.

Disadvantages of Audio/Video Analysis:

- **Time-consuming and costly:** The review and analysis of audios/videos is time-consuming. Again, with more number of audios/videos to record, the requirement for equipment and audio recorders/videographers goes up. Similarly, in case the user groups or individual users being shot are experts, they'll charge a fee to participate in the research.
- **No probing:** In cases where the researcher isn't present at the time of shooting the audio/ video, if later the researcher spots an interesting action performed by the users, there is no possibility of probing the user further.
- **Researcher attitudes:** In some studies, when the researcher is aware that an audio/video is being recorded, they can become relaxed during the session because any missed detail can be revisited when reviewing the recorded media.

PARTICIPANT OBSERVATION:

Participant observation is a qualitative research method in which the researcher not only observes the research participants, but also actively engages in the activities of the

research participants. This requires the researcher to become integrated into the participants' environment while also taking objective notes about what is going on. Most researchers who conduct participant observations take on the role that they are interested in studying.

There are three important pieces of participant observation:

- Gaining entry into the location you wish to study
- Establishing rapport with the research participants under investigation
- Making sure you spend enough time with the research participants in the environment to get a sufficient amount of data for your study

Reason to Use Participant Observation:

There are many reasons that researchers choose to use participant observation. Participant observation provides the researcher with access to different types of information that may not be easily accessible to outsiders. For example, students who are not enrolled in the foreign language class may not know what the rules and expectations are like in the classrooms or the nature of the interactions between the students and the teacher.

Participant observers integrate themselves into the environment and are often considered part of the culture and group. It is not uncommon for research participants to forget that they are being observed, which reduces the likelihood that research participants will modify their behavior or try to 'act well' because they are being observed. They might consider Jill a part of the group and act as they normally would around her.

Participant observations help the researcher decide which questions are relevant, what language to use, and what the culture is like. By being a part of the group, Jill can get a better feel of what is important to the research participants. She can also pick up on the language that they use and what certain words mean. If Jill decided to conduct research interviews later, she could use her background knowledge of the participants to help her create research questions.

Four different positions on a continuum of participant observation roles are:

- Complete participant.
- Participant-as-observer.
- Observer-as-participant.
- Complete observer.

- **Complete Participant:** This is a fully embedded researcher, almost like a spy. Here the observer fully engages with the participants and partakes in their activities.

Participants aren't aware that observation and research is being conducted, even though they fully interact with the researcher. This has sometimes been referred to as "going native," in reference to performing indigenous fieldwork.

- **Observer as Participant:** Here the researcher is known and recognized by the participants and in many cases, the participants know the research goals of the observer.

There is some interaction with the participants but the interaction is limited. The researcher's aim is to play a neutral role as much as possible.

This approach is generally used when "following a customer home" to understand how someone uses software products to accomplish goals.

- **Participant as Observer:** Here the researcher is fully engaged with the participants. She is more of a friend or colleague than a neutral third party. While there is full interaction with participants, they still know that this is a researcher. This method is often used when studying remote indigenous populations or inner-city cultures.

- **Complete Observer:** This is a detached observer where the researcher is neither seen nor noticed by participants. It's one way of minimizing the Hawthorne Effect as participants are more likely to act natural when they don't know they're being observed.

While this was once considered an objective role for the ethnographer, it's fallen out of favor because it's the role most likely to raise ethical questions about possible deception.

UNIT 2: TECHNICAL AND FORMULATION OF RURAL PLANNING

2.1: APPLICATION OF QUALITATIVE RESEARCH TECHNIQUE

STAKEHOLDER ANALYSIS: A **stakeholder analysis** is a process of identifying these people before the project begins; grouping them according to their levels of participation, interest, and influence in the project; and determining how best to involve and communicate each of these stakeholder groups throughout.

PURPOSE OF STAKEHOLDER ANALYSIS

Project managers, program managers, and product managers alike may conduct a stakeholder analysis for several strategic reasons, including:

1. To enlist the help of key organizational players.

By approaching company influencers, executives, or valuable stakeholders for help early in your project, you can leverage the knowledge and wisdom of these key players to help guide the project to a successful outcome. Enlisting these players early on will also increase the chances you will earn their support for your project.

But before you can determine which influencers and other key stakeholders to approach, you'll need to conduct a stakeholder analysis.

2. To gain early alignment among all stakeholders on goals and plans.

Because your stakeholder analysis will help you determine which people to involve in the project, you will then be able to bring these people together for a kickoff and early-stage meetings to communicate the project's strategic objectives and plans.

[Over a third of product managers in 2021, wish they had a clearer purpose and company strategy.](#) A stakeholder analysis will help ensure everyone starts the project with a clear understanding of what success will look like and how they can contribute to that successful outcome.

3. To help address conflicts or issues early on.

Without a stakeholder analysis, you and your team could be well into a company project before you realize a key person in your organization—perhaps an executive—does not see the value of

your initiative, or would prefer to redeploy some of your resources to other projects. Such a person might actively work to thwart or derail your project.

If you had conducted a stakeholder analysis before you began, you would have likely identified this executive as potentially important to your project's success. You could have then presented your plan to the executive, listened to their objections, and worked to earn their approval to proceed.

Watch this video for an in-depth explanation of stakeholder analysis and to learn how to efficiently conduct a stakeholder analysis.

IMPORTANCE OF CONDUCTING STAKEHOLDER ANALYSIS

Conducting a stakeholder analysis can be strategically valuable when kicking off any type of complex company undertaking. The more stakeholders you can identify early on and the more you can tailor your communication to win approval and support from various stakeholders, the more likely your project is to succeed.

But if you consider how much of an organization is either involved in or affected by the development of a product—engineering, design, procurement, sales, marketing, product, finance, accounting, customer success, etc.—you can understand why stakeholder analysis is an essential exercise for a product manager.

After all, the way you manage the many stakeholders across your company whose jobs your product could impact—starting with identifying them through a stakeholder analysis—could mean the difference between these stakeholders enthusiastically helping your product's development or trying to block its progress.

STEPS OF CONDUCTING STAKEHOLDER ANALYSIS

Stakeholder analysis exercises will vary by company, industry, and the teams conducting them (e.g., project management vs. product management). But there are useful steps common to most of these types of analyses. Here's how many organizations conduct a stakeholder analysis.

Step 1: Determine who your stakeholders are.

Start by brainstorming with your team a list of all possible stakeholders for your project. Of course, you can reduce this list later, but you don't want to miss a potentially pivotal stakeholder at this early stage.

The list of potential stakeholders could include:

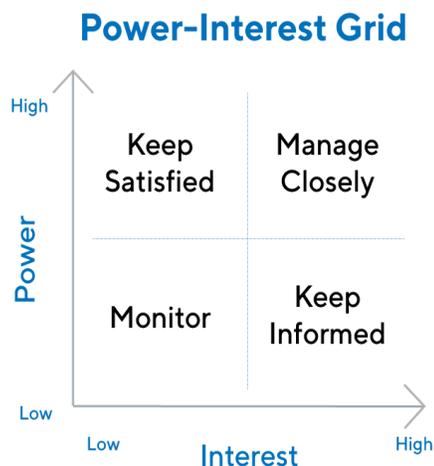
- Executive staff
- Marketing
- Sales
- Finance
- Product
- Development/engineering/manufacturing
- Procurement
- The heads of all affected business units
- Consultants
- Operations/IT

Step 2: Group and prioritize these stakeholders.

After you've completed your brainstorming session above and determined which people and teams will indeed be stakeholders, you should start categorizing them in terms of their influence, interest, and levels of participation in your project.

One example of how to do this is by using the [power/interest grid](#).

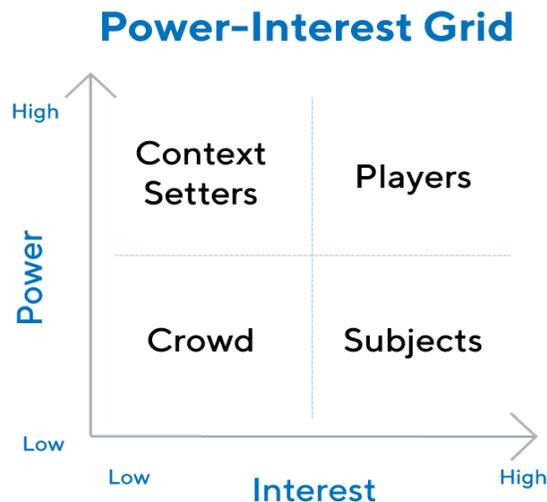
As you can see, you will group stakeholders into four categories:



1. **High power, high interest:** These are your most important stakeholders, and you should [prioritize](#) keeping them happy with your project's progress.
2. **High power, low interest:** Because of their influence in the company, you should work to keep these people satisfied. But because they haven't shown a deep interest in your project, you could turn them off if you over-communicate with them.

3. **Low power, high interest:** You'll want to keep these people informed and check in with them regularly to make sure they are not experiencing problems on the project.
4. **Low power, low interest:** Just keep these people informed periodically, but don't overdo it.

Another approach, popularized in the book [Making Strategy: Mapping Out Strategic Success](#), groups stakeholders into four different but similar categories.



1. **Players:** These are the high-power, high-interest individuals with whom you will want to collaborate and keep fully engaged.
2. **Subjects:** These are the low-power, high-interest stakeholders who can offer great insights and ideas for the project but whom you don't need to always say yes to.
3. **Context-setters:** These high-power, low-interest stakeholders (heads of departments, for example) can have a lot of influence over the project but don't want to be involved in the details. Keep them up to date.
4. **Crowd:** Finally, the low-power, low-interest stakeholders are called the crowd. These individuals will require some ongoing communication about the project's progress but probably the least of all stakeholders.

Step 3: Figure out how to communicate with and win buy-in from each type of stakeholder.

Once you've built your list detailing which stakeholders fall into which category, it's time to think strategically about how best to earn the ongoing support of each of these stakeholder types. First, you will want to ask yourself questions about your stakeholders such as:

- What motivates this stakeholder?

- What other priorities do they have, and how can we align our project with those priorities (or at least ensure the project won't threaten them)?

SWOT ANALYSIS: SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a [company's competitive position](#) and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription.

FEATURES:

- SWOT analysis is a strategic planning technique that provides assessment tools.
- Identifying core strengths, weaknesses, opportunities, and threats leads to fact-based analysis, fresh perspectives, and new ideas.
- SWOT analysis works best when diverse groups or voices within an organization are free to provide realistic data points rather than prescribed messaging.

SWOT Analysis

SWOT analysis is a technique for assessing the performance, competition, risk, and potential of a business, as well as part of a business such as a product line or division, an industry, or other entity.

Using [internal and external data](#), the technique can guide businesses toward strategies more likely to be successful, and away from those in which they have been, or are likely to be, less successful. Independent SWOT analysts, investors, or competitors can also guide them on whether a company, product line, or industry might be strong or weak and why.

Strengths

Strengths describe what an organization excels at and what [separates it from the competition](#): a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favorable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and [market share](#).

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.

SWOT Table

Strengths

1. What is our competitive advantage?
2. What resources do we have?
3. What products are performing well?

Threats

1. What new regulations threaten operations?
2. What do our competitors do well?
3. What consumer trends threaten business?

METHODS

Internal

What occurs within the company serves as a great source of information for the strengths and weaknesses categories of the SWOT analysis. Examples of internal factors include financial and human resources, tangible and intangible (brand name) assets, and operational efficiencies.

Potential questions to list internal factors are:

- (Strength) What are we doing well?
- (Strength) What is our strongest asset?
- (Weakness) What are our detractors?
- (Weakness) What are our lowest-performing product lines?

External

What happens outside of the company is equally as important to the success of a company as internal factors. External influences, such as monetary policies, market changes, and access to suppliers, are categories to pull from to create a list of opportunities and weaknesses.¹

Potential questions to list external factors are:

- (Opportunity) What trends are evident in the marketplace?
- (Opportunity) What demographics are we not targeting?
- (Threat) How many competitors exist, and what is their market share?
- (Threat) Are there new regulations that potentially could harm our operations or products?

Use a SWOT analysis to identify challenges affecting your business and opportunities that can enhance it. However, note that it is one of many techniques, not a prescription.

SWOT Analysis Example

In 2015, a Value Line SWOT analysis of The Coca-Cola Company noted strengths such as its globally famous brand name, vast distribution network, and opportunities in emerging markets. However, it also noted weaknesses and threats such as foreign currency fluctuations, growing public interest in "healthy" beverages, and competition from healthy beverage providers.²

Its SWOT analysis prompted Value Line to pose some tough questions about Coca-Cola's strategy, but also to note that the company "will probably remain a top-tier beverage provider" that offered conservative investors "a reliable source of income and a bit of capital gains exposure."

Five years later, the Value Line SWOT analysis proved effective as Coca-Cola remains the 6th strongest brand in the world (as it was then). Coca-Cola's shares (traded under ticker symbol KO) have increased in value by over 60% during the five years after the analysis was completed.

To get a better picture of a SWOT analysis, consider the example of a fictitious organic smooth company. To better understand how it competes within the smoothie market and what it can do better, it conducted a SWOT analysis. Through this analysis, it identified that its strengths were good sourcing of ingredients, personalized customer service, and a strong relationship with suppliers. Peering within its operations, it identified a few areas of weakness: little product diversification, high turnover rates, and outdated equipment.

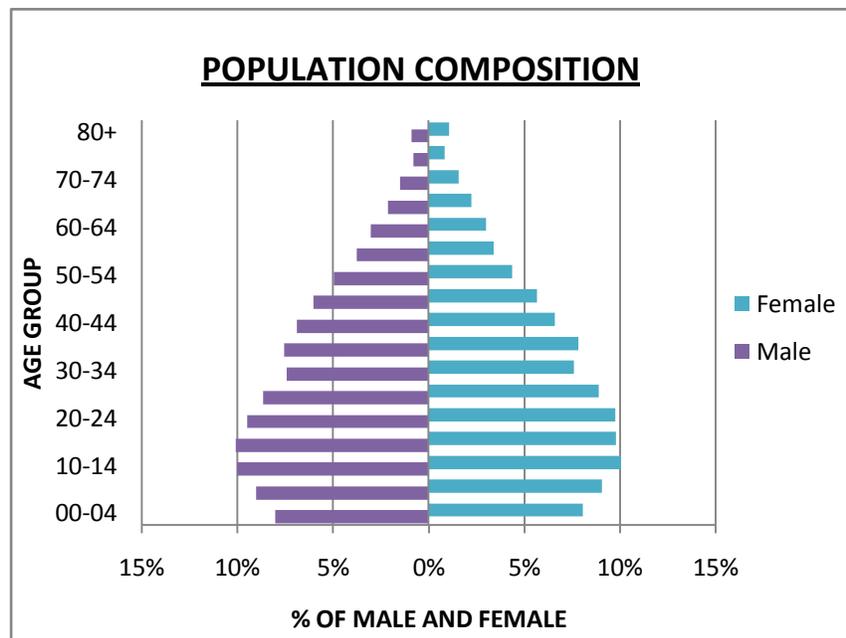
Examining how the external environment affects its business, it identified opportunities in emerging technology, untapped demographics, and a culture shift towards healthy living. It also found threats, such as a winter freeze damaging crops, a global pandemic, and kinks in the supply chain. In conjunction with other planning techniques, the company used the SWOT analysis to leverage its strengths and external opportunities to eliminate threats and strengthen areas where it is weak.

2.2 APPLICATION OF STATISTICAL TECHNIQUES IN DEMOGRAPHIC DATA ANALYSIS

❖ POPULATION COMPOSITION:

Population composition refers to the structure of the population. Population composition helps to know the number of males or female, their age-groups, literacy, their occupation, their income level and health conditions etc. **Population composition** is the description of a **population** according to characteristics such as age and sex. These data are often compared over time using **population** pyramids.

POPULATION PYRAMID: Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays in each five year age group are represented using horizontal bars. Population pyramid of countries can differ markedly as a result of past and current patterns of birth rates, death rates, and migration.



INTERPRETATION:

The above diagram shows the population pyramid which display age group that are represented using horizontal bar. On the vertical axis we have plotted age group. And on the horizontal axis we have plotted percentage of male and female population.

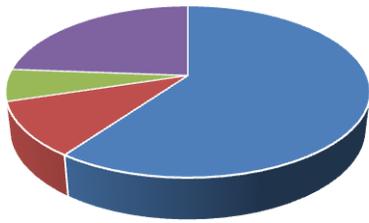
Thus from the above diagram we can interpret that ratio between male and female is almost same. The age group between 10-24 has the highest population. The age group between 70-80 (dependent population) having lowest population. The child dependent population has larger population than the older dependent population. Thus the population increases from the age group 10 to 24 and then it can decreases.

❖ **OCCUPATIONAL STRUCTURE:**

This refers to the aggregate distribution of [occupations](#) in society, classified according to skill level, economic function, or social status. The occupational structure is shaped by various factors: the structure of the economy (the relative weight of different industries); [technology](#) and [bureaucracy](#) (the distribution of technological skills and administrative responsibility); the [labour-market](#) (which determines the pay and conditions attached to occupations); and by [status](#) and prestige (influenced by occupational [closure](#), life-style, and social values). It is difficult to attach causal primacy to any one of these factors; moreover, their role in shaping the occupational structure changes over time, as society changes. For example, during the early phase of European [industrialization](#), the dominance of [manufacturing](#) made for a preponderance of manual occupations, while in recent times the shrinking of this sector, together with the growth in services, has made for an expansion of white-collar occupations. The distinction between manual and non-manual occupations has also become blurred. The occupational structure is described and analysed by means of various classificatory schemes, which group similar occupations together according to specific criteria such as skill, employment status, or function. Such classifications are also used as a basis for the empirical analysis of economic and social class. See also [INDUSTRIAL SECTOR; OCCUPATIONAL CLASSIFICATION](#).

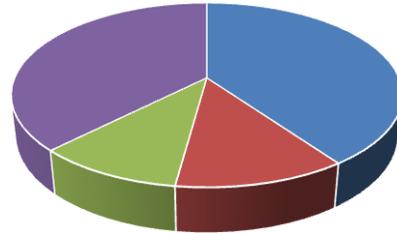
STATES	CULTIVATORS		AGRICULTURAL LABOURERS		HOUSEHOLD INDUSTRY WORKERS		OTHER WORKERS	
	2001	1991	2001	1991	2001	1991	2001	1991
ARUNACHALPRADESH	57.8	60.8	3.9	5.4	1.3	0.2	37.0	33.7
ASSAM	39.1	54.8	13.2	12.6	3.6	1.0	44.0	31.7
MANIPUR	40.2	59.9	12.0	10.3	10.3	6.0	37.6	23.8
MEGHALAYA	48.1	56.3	17.7	13.0	2.2	0.4	32.0	30.3
MIZORAM	54.9	62.3	5.7	5.4	1.5	1.1	37.9	31.2
NAGALAND	64.7	72.6	3.6	1.6	2.6	0.4	29.0	25.3
TRIPURA	27.0	39.0	23.8	24.2	3.0	1.6	46.1	35.2
SIKKIM	49.9	58.0	6.5	8.2	1.6	0.8	42.0	33.1

MANIPUR(1991)



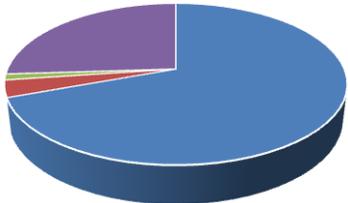
■ cultivator ■ agriculture ■ household ■ others

MANIPUR(2001)



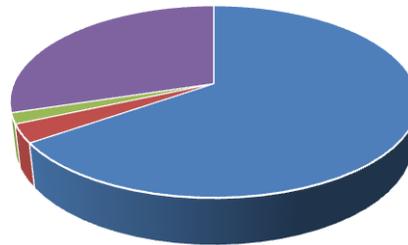
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HIMACHAL PRADESH(1991)



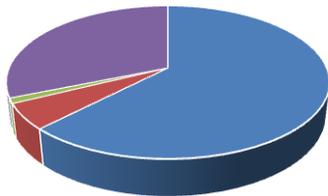
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HIMACHAL PRADESH(2001)



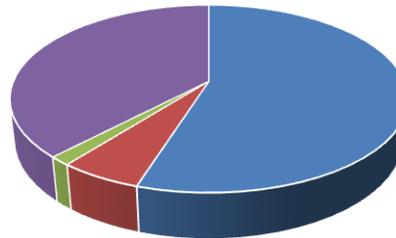
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MIZORAM(1991)



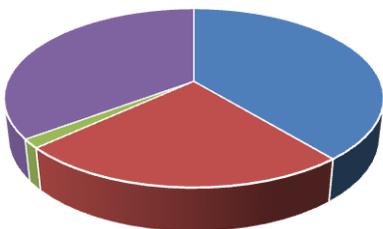
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MIZORAM(2001)



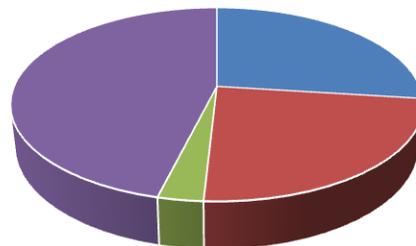
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TRIPURA(1991)



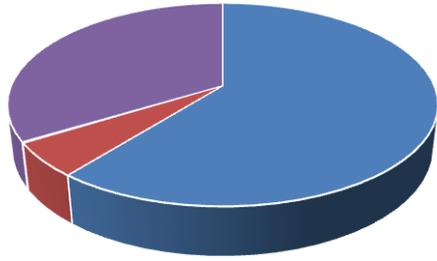
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TRIPURA(2001)



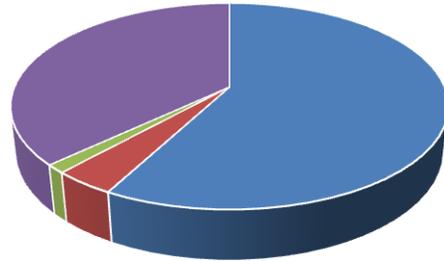
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ARUNACHALPRADESH(1991)



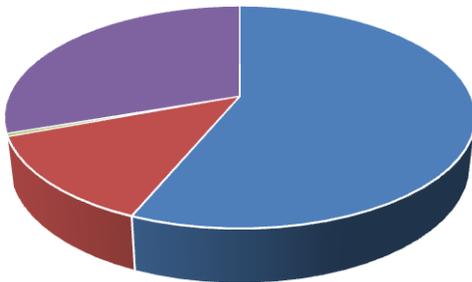
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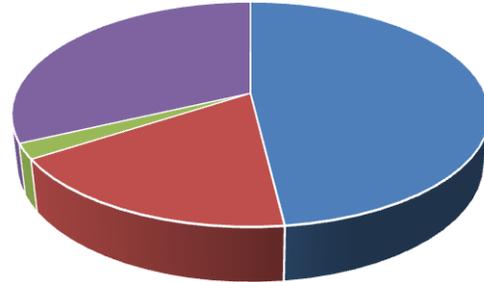
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MEGHALAYA(1991)



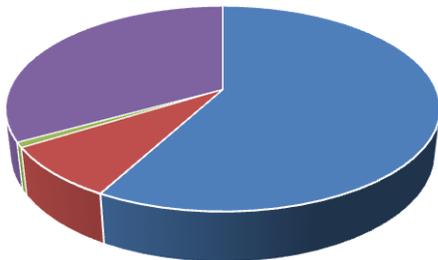
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MEGHALYA(2001)



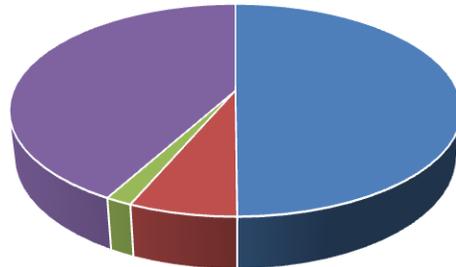
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SIKKIM(1991)



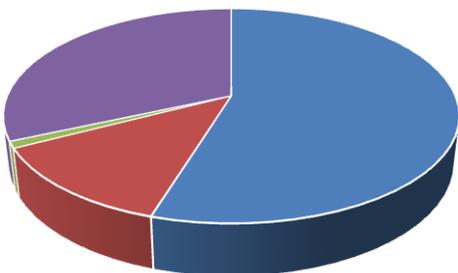
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SIKKIM(2001)



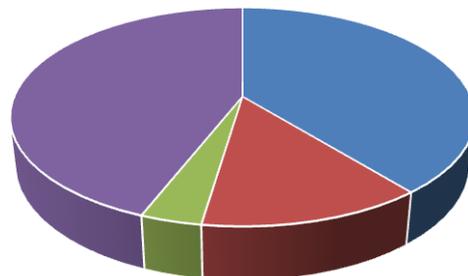
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ASSAM(1991)



■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ASSAM(2001)



■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

INTERPRETATION

The above pie diagrams show the occupational structure of the people of North Eastern States of India. The occupations have been classified into four categories- cultivator, agricultural, household and others.

The first pie diagrams show the occupational structure of Manipur in the year 1991 and 2001. In 1991 most of the people almost 60% are engaged in cultivator. But in the year 2001 it has decreased to 40.2%. In the year 2001, these 20 % people have changed their occupation to other economic activities. But in Himachal Pradesh % of people engaged in different types of economic activities are almost same for both the years 1991 and 2001.

From the above diagrams we can interpret that people from north east India mostly engaged in cultivators. Very few people engaged in agricultural and household activities.

❖ DEPENDENCY RATIO:

The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0-14 and 65+) and those typically in the labour force (the productive part ages 15-64). It is used to measure the pressure on the productive population.

FORMULAE:

In published international statistics, the dependent part usually includes those under the age 15 and over the age of 64. The productive part makes up the population in the between ages 15-64. It is normally expressed as a percentage:

$$\text{(Total) Dependency ratio: } \frac{\text{(no. of people aged 0-14) + (no. of people aged 65 and over)} * 100}{\text{no. of people aged 15-64}}$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. This results in direct impacts on financial expenditures on things like social security, as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and the aged dependency ratio.

$$\text{Child dependency ratio} = \text{no. of people aged 0-14} / \text{no. of people aged 15-64} * 100$$

$$\text{Aged dependency ratio} = \text{no. of people aged 65 and over} / \text{no. of people 15-64} * 100$$

TABLE SHOWING % OF AGED AND CHILD DEPENDENT POPULATION

Age Group	Male	Female	Total		
00-04	37,43,862	35,89,281	7333143		
05-09	42,16,763	40,31,046	8247809	24737475	
10-14	46,77,506	44,79,017	9156523		
15-19	47,02,325	43,55,706	9058031		40.26986
20-24	44,22,630	43,35,692	8758322		
25-29	40,44,904	39,53,005	7997909		
30-34	34,64,659	33,76,931	6841590		
35-39	35,23,361	34,89,285	7012646	61429261	
40-44	32,19,604	29,33,456	6153060		
45-49	28,14,212	25,21,507	5335719		
50-54	23,17,232	19,40,648	4257880		47.69168
55-59	17,46,903	15,21,747	3268650		
60-64	14,06,401	13,39,053	2745454		
65-69	9,91,280	9,91,713	1982993		
70-74	6,86,881	7,03,726	1390607		7.421821
75-79	3,60,216	3,79,551	739767	4559170	
80+	4,06,536	4,77,025	445803		
Total	4,67,45,275	4,44,18,389	90725906		

CALCULATION HAS BEEN DONE WITH THE HELP OF THE FORMULAEs i.e. were mentioned above.

❖ **MEASURES OF MIGRATION BASED ON CENSUS**

Migration has been defined as spatial or geographic mobility involving a change of residence between clearly defined geographic and administrative areas. The internal migration involves several types of migratory moves: 1) rural to urban migration, 2) rural to rural migration, 3) urban to rural migration, 4) urban to urban migration, and 5) interregional migration. The methods used in measuring internal migration are classified into 2 main types: direct and indirect methods. The direct measures are based on data from the following census topics: 1) places of birth, 2) duration of residence, 3) place of last residence, and 4) place of residence at a fixed prior date. The indirect methods of internal migration estimation are classified into 2 broad types: 1) the National Growth Rate Method, and 2) Residual Method comprising the Vital Statistics method and the Survival Ratio method. The principle of the indirect method is that population increment between and 2 dates for any geographic area is the result of natural increase and net migration. In general, an internal migration rate is the number

of internal migratory events divided by the population exposed to the possibility of internal migration.

Formulas:

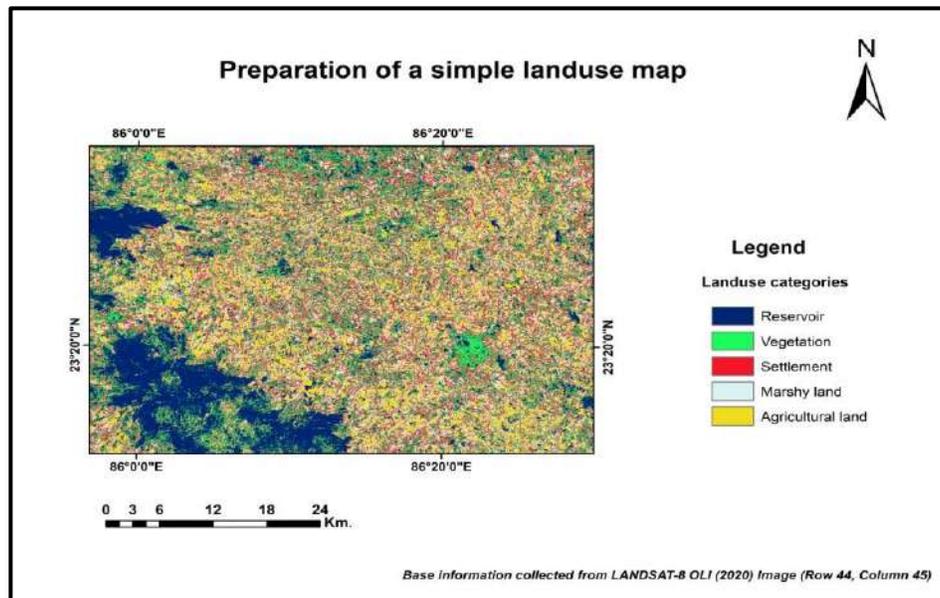
In vital statistic method:

Net M = (Pt+n)-Pt-(B-D) where, Net M is net migration, Pt is the population at the earlier census, Pt+n is the population at the later census, B is the no. of birth that occurred to the residents of the area, D is the death that occurred to the residents of the area.

2.2: APPLICATION OF GIS & RS

Preparation of Land Use Map Using Open Soft Ware:

Land Use maps of an area provide information to help users to understand the current landscape. The map, that reflects the land resources and types of land use in the national economy. Land use maps are subdivided into land resource, land in service, and agricultural land use maps.



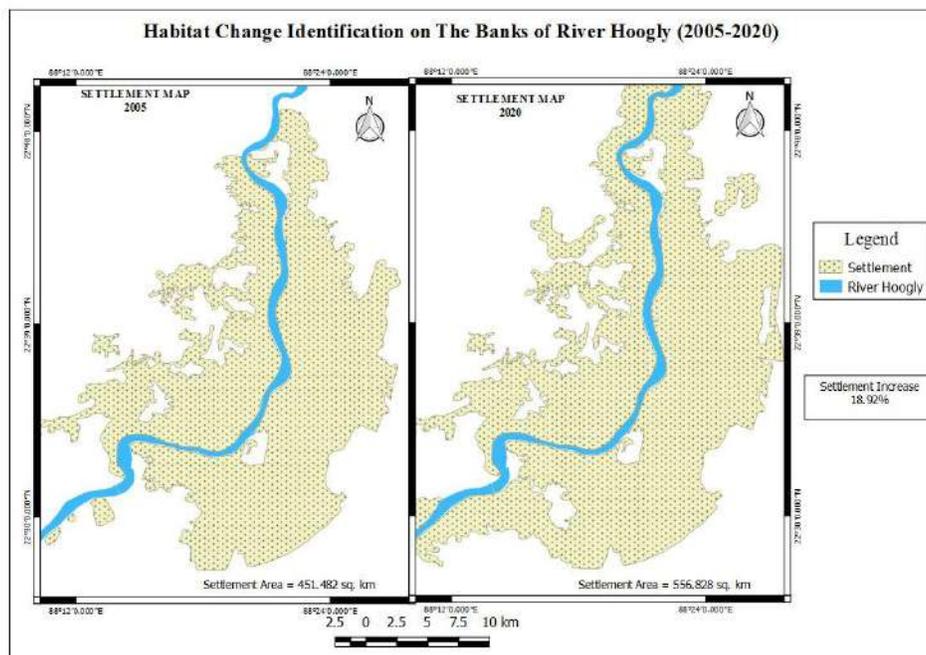
INTERPRETATION:

Here we have prepared a land use map of Purulia District of West Bengal. A major part of the area is covered by agricultural land (34.44971 sq. km). In this land use map 4.3496 sq. km, 15.3275 sq. km, 20.9375 sq. km, and 24.9356 sq. km area are covered by settlement, reservoir, vegetation and marshy land respectively.

2.3: MAPPING OF HUMAN HABITATION & DETECTION OF CHANGE:

HUMAN SETTLEMENT OR HUMAN HABITATION: A settlement, locality or populated place or habitation is a community in which people live. The complexity of a settlement can range from a small number of dwellings grouped together to the largest of cities with surrounding urbanized areas. Settlements may include hamlets, villages, towns and cities. A settlement may have known historical properties such as the date or era in which it was first settled, or first settled by particular people.

Change detection in GIS is a method of understanding how a given area has changed between two or more time periods. Change detection is helpful for understanding the change in forest coverage, ice sheets, and land use and settlement. Change detection involves comparing changes between aerial photographs taken over different time periods that cover the exact same geographic area.



INTERPRETATION:

The above map displayed the habitat change on the banks of river Hooghly. Here we have taken 2 satellite maps (year of 2005 and 2020) of the bank of the Hooghly river. The map shows that, the settlement of the mentioned area has increases about 18.92%.

$$\% \text{ of Settlement change} = \frac{(\text{Area of 2020} - \text{Area of 2005})}{\text{Area of 2005}} * 100$$

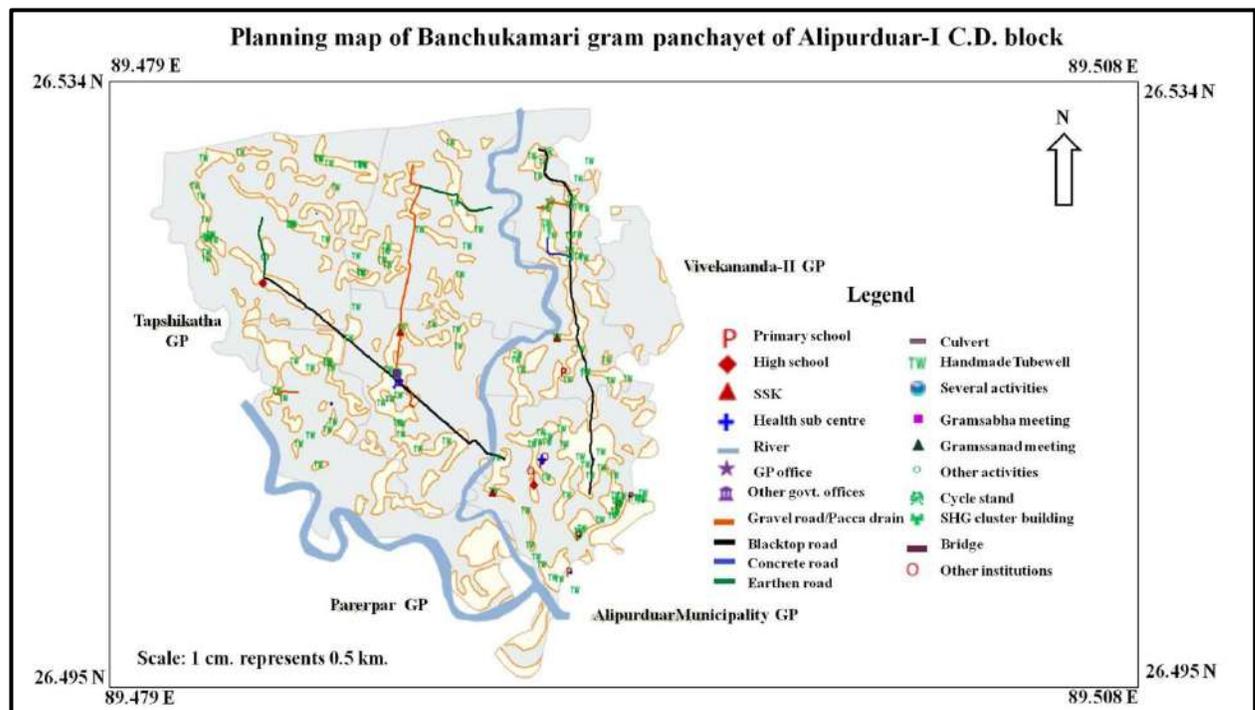
2.4: SPATIAL PLAN FORMULATION & LAYOUT FOR A VILLAGE LEVEL PLANNING

Village maps are effective tools that help in understanding the geography of a village settlement. It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.

Village maps are effective tools that help in understanding the geography of a village settlement. It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.

Key Benefits:

- Conducts social mapping to illustrate the layout of houses, streets, hamlets and infrastructure in the village
- Identifies the most ideal locations to open schools
- Helps in making assessment regarding the status of the village, infrastructure facilities and employment opportunities
- Identifies the infrastructural and other development needs of the village
- It helps in analysis, planning and decision making activities at the rural level by



overlaying the demographics of the population like literacy rate, number of workers, age etc.

- It also helps in determining the road networks i.e. the national highways, state highways with major rivers and forest around the particular village

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M. Sc 4th SEMESTER

ROLL NO – BGC/MGF/SIV/21 –
312

PAPER – GEOPDSE04P

NAME – SAYANI DAS

SUBJECT – REGIONAL

PLANNING & RURAL

DEVELOPMENT

PRACTICAL

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**RURAL
RESEARCH
METHOD
&
METHODOLOGY**

PRE-FIELD ISSUES ON RURAL RESEARCH

✦ CONTEMPORARY RESEARCH TREND:

In the Indian context, villages are the heart of the nation but still it is growing fact that the rural population is suffering more consequences for livelihood as compared to urban areas. The difficulties of livelihood may be forcing rural population to migrate to the urban areas which is one of the major challenge. If situation remains same, urban growth will be unavoidable, as the economic pursuits and aspirations of the population always change and evolve.

Village developmental activities and plans were formulated by government in order to mitigate poverty, unemployment, illiteracy, malnutrition in kids, health problem and also to provide basic needs of livelihood. However, due to lack of implementation, many villages are still deprived of drinking water, sanitation facilities, primary health centers, equipped primary schools, electricity, proper road and public transportation system, banks and communication services. All these programs and Policy have met with limited success. The “Smart Village” concept could address these challenges comprehensively. All these programme and policies can converge in smart village development by adding smart solutions.

RESEARCH

What is Research?

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words, research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.

What is Inductive Method ?

Inductive approaches are associated with qualitative research

Deductive approaches are associated with quantitative research

What is Qualitative Research ?

Qualitative research involves collecting and analyzing nonnumerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

What is Quantitative Research ?

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations

Methods of Qualitative Research

Observations: Recording what you have seen, heard, or encountered in detailed field notes.

Interviews: Personally asking people questions in one-on-one conversations.

Focus groups: Asking questions and generating discussion among a group of people.

Methods of Quantative Research

Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques.

Characteristics of Good Research

- Good research follows a systematic approach to capture accurate data.
- Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

Research data

Valid – founded, logical, rigorous, and impartial.

Accurate – free of errors and including required details.

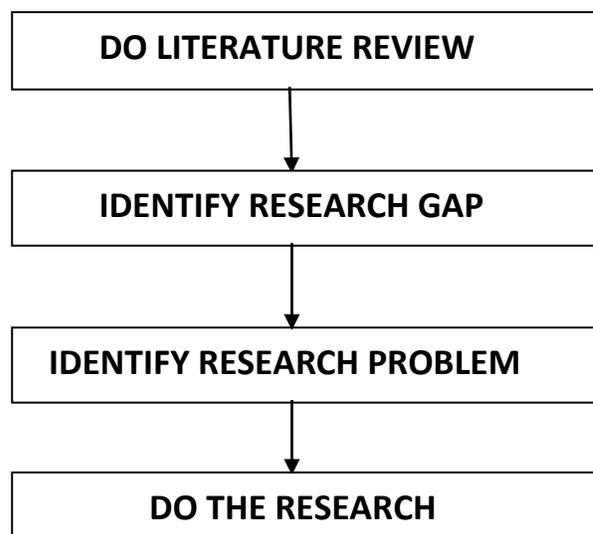
Reliable – other people who investigate in the same way can produce similar results.

Timely – current and collected within an appropriate time frame.

Complete – includes all the data you need to support your business decisions.

LITERATURE SEARCH ON RESEARCH PROBLEM STATED

STEPS TAKEN FOR LITERATURE SEARCH ON RESEARCH PROBLEM



LITERATURE REVIEW: A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. The review should enumerate, describe, summarize, objectively evaluate and clarify this previous research.

PURPOSE OF LITERATURE REVIEW: A literature review establishes familiarity with and understanding of current research in a particular field before carrying out a new investigation. Conducting a literature review should enable you to find out what research has already been done and identify what is unknown within your topic.



FRAMING RESEARCH QUESTION AND HYPOTHESIS

BASIC STEPS:

- **IDENTIFY RESEARCH GAP**
- **SELECTION OF METHOD**
- **SPECIFIC ASSUMPTION**
- **TEST THE ASSUMPTION**
- **END RESULT**
- **GIVE SUGGESTION**

HYPOTHESIS

DEFINITION: A hypothesis is a precise, testable statement of what the researchers predict and what will be the outcome of the study. This usually involves proposing a possible relationship between two variables: the independent variable (what the researcher changes) and the dependent variable (what the research measures).

In research, there is a convention that the hypothesis is written in two forms, the null hypothesis, and the alternative hypothesis (called the experimental hypothesis when the method of investigation is an experiment).

PURPOSE OF HYPOTHESIS:

A hypothesis should always:

- ❖ **Explain what you expect to happen**
- ❖ **Be clear and understandable**
- ❖ **Be testable**
- ❖ **Be measurable**
- ❖ **Contain an independent and dependent variable**

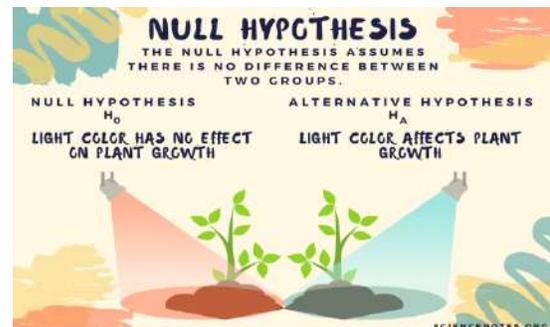
TYPES OF HYPOTHESIS:

ALTERNATIVE HYPOTHESIS: The alternative hypothesis states that there is a relationship between the two variables being studied (one variable has an effect on the other).

It states that the results are not due to chance and that they are significant in terms of supporting the theory being investigated.

NULL HYPOTHESIS: The null hypothesis states that there is no relationship between the two variables being studied (one variable does not affect the other).

It states results are due to chance and are not significant in terms of supporting the idea being investigated.



NON DIRECTIONAL HYPOTHESIS

A two-tailed non-directional hypothesis predicts that the independent variable will have an effect on the dependent variable, but the direction of the effect is not specified.

DIRECTIONAL HYPOTHESIS

A one-tailed directional hypothesis predicts the nature of the effect of the independent variable on the dependent variable

EXAMPLE OF HYPOTHESIS

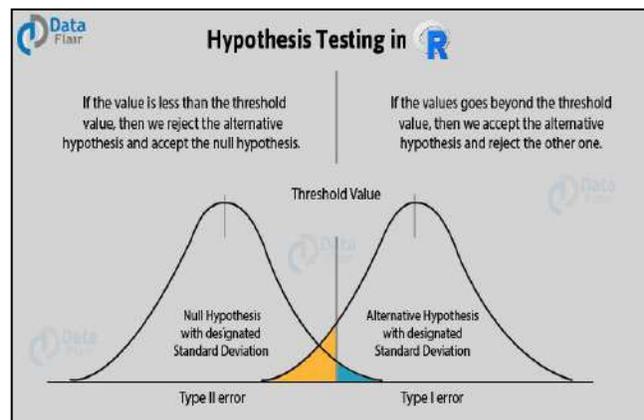
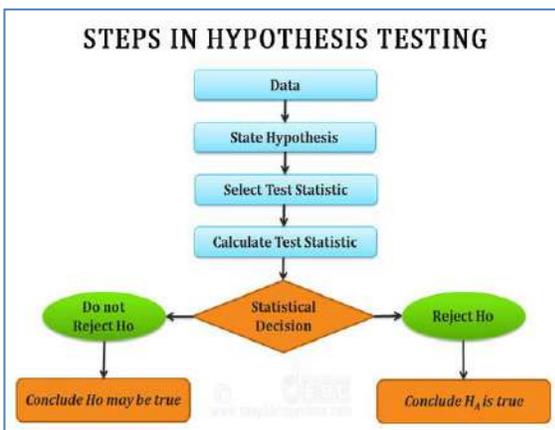
Let's consider a hypothesis that many teachers might subscribe to: that students work better on Monday morning than they do on a Friday afternoon (IV=Day, DV=Standard of work).

Now, if we decide to study this by giving the same group of students a lesson on a Monday morning and on a Friday afternoon and then measuring their immediate recall on the material covered in each session we would end up with the following:

- The **alternative hypothesis** states that students will recall significantly more information on a Monday morning than on a Friday afternoon.
- The **null hypothesis** states that there will be no significant difference in the amount recalled on a Monday morning compared to a Friday afternoon. Any difference will be due to chance or confounding factors.

The null hypothesis is, therefore, the opposite of the alternative hypothesis in that it states that there will be no change in behaviour. However, we can never 100% prove the alternative hypothesis. What we do instead is see if we can disprove, or reject, the null hypothesis.

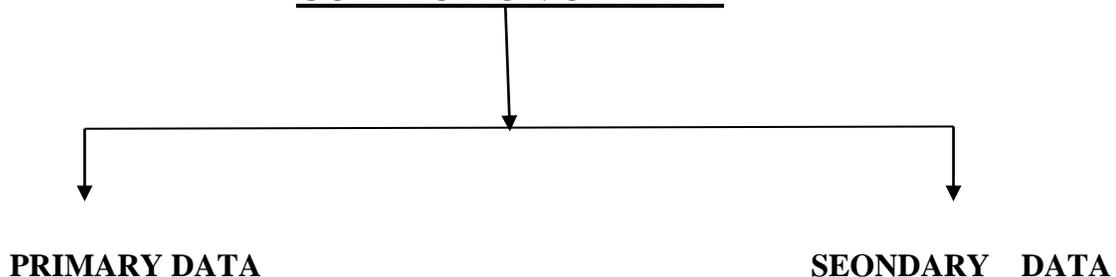
If we reject the null hypothesis, this doesn't really mean that our alternative hypothesis is correct – but it does provide support for the alternative / experimental hypothesis.



STEPS TO SELECT STUDY AREA AND TARGET POPULATION

- Identify the problem of a specific study area.
- See that there is no previous work on that problem.
- Select the problem for mitigation.
- Identify the victimized people.
- Do primary survey.
- Mitigate the problem.
- Do the research.

COLLECTION OF DATA



SECONDARY DATA refers to data that is collected by someone other than primary user.

Common sources of secondary data for social science include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes.

PRIMARY DATA collected by observation, interview, focus group, survey.

PREPARING SURVEY SCHEDULED AND QUESTIONNAIRE

DEFINATION OF QUESTIONNAIRE:

We define questionnaire as an instrument for research, which consists of a list of questions, along with the choice of answers, printed or typed in a sequence on a form used for acquiring specific information from the respondents.

The questionnaire is prepared in such a way that it translates the required information into a series of questions, that informants can and will answer. Further, it should be such that the respondent gets motivated and encouraged, to make him engaged in the interview and complete it. The merits of questionnaires are discussed below:

- It is an inexpensive method, regardless of the size of the universe.
- Free from the bias of the interviewer, as the respondents answer the questions in his own words.
- Respondents have enough time to think and answer.

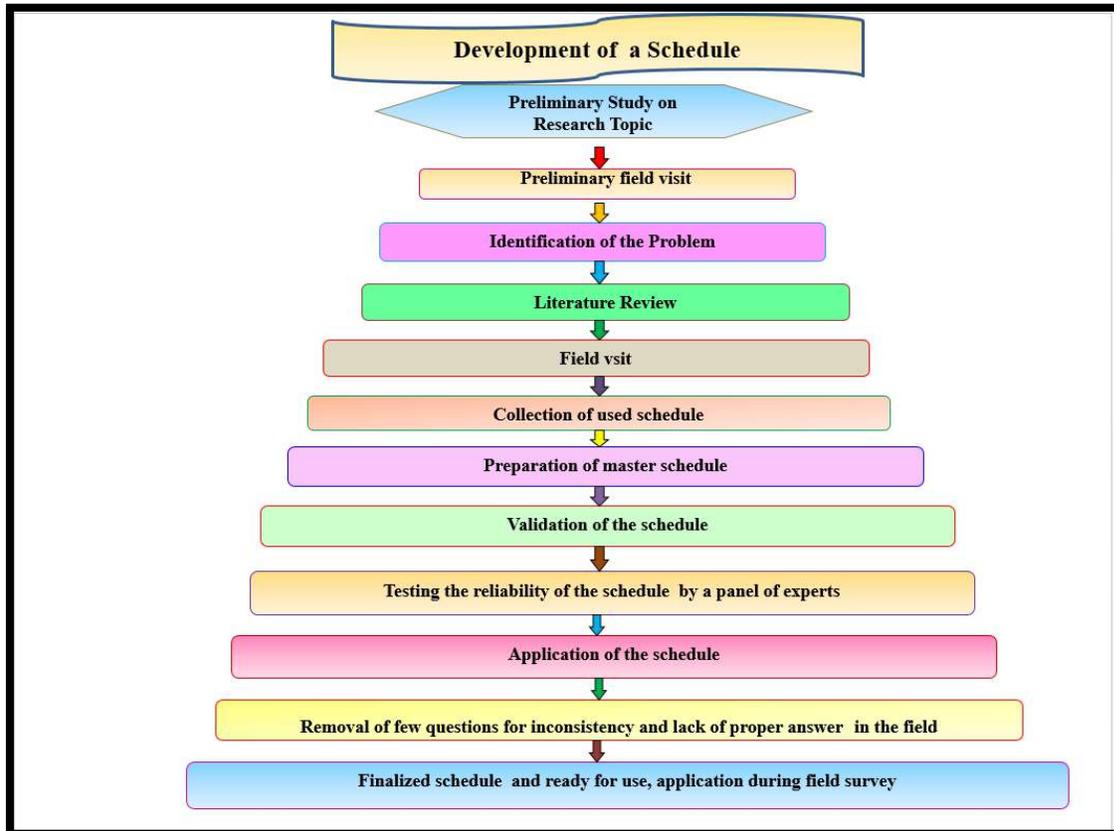
Steps in Making a Questionnaire

- **Identify a theme.** With a theme, you can specify what data needs to be gathered and how these may be acquired in the form of a question.
- **Ask simple questions.** Be as specific as possible. Your respondents need to be able to answer each question without much deliberation.
- **Ask the same question in different ways.** There's always a chance that your respondent may be answering the questionnaire absentmindedly. To assess the reliability of such response, ask the same question several times but in different ways.
- **Choose a delivery method.** If you want to reach a wider audience, you can distribute your questionnaires through various social networks.

DEFINATION OF SCHEDULE:

The schedule is a proforma which contains a list of questions filled by the research workers or enumerators, specially appointed for the purpose of data collection. Enumerators go to the informants with the schedule, and ask them the questions from the set, in the sequence and record the replies in the space provided. There are certain situations, where the schedule is distributed to the respondents, and the enumerators assist them in answering the questions.

This method is little expensive as the selection, appointment and training of the enumerators require a huge amount. It is used in case of extensive enquiries conducted by the government agencies, big organisations. Most common example of data collection through schedule is population census.



DIFFERENCE BETWEEN QUESTIONNAIRE AND SCHEDULE

The important points of difference between questionnaire and schedule are as under:

1. The questionnaire is one of the methods used for data collection. The questionnaire will have many questions, with each question having multiple choices. The schedule is also one of the methods of data collection. It will have a set of statements, questions and space given to note down the answers.
2. Questionnaire method of data collection is preferred when the respondents are willing to cooperate. In addition, to deploy this method the respondents need to be literate.

The Schedule method of data collection can be utilised irrespective of the respondent's literacy. It can be used when the respondents are literate and can be used even when the respondents are illiterate.

3. The type of technique used in the Questionnaire method is Quantitative. The type of technique used in the Schedule method is Qualitative.
4. In the Questionnaire method, the grouping is made on the basis of different categories like location, age, gender etc. In the schedule method of data collection, the grouping may exist or may not exist.
5. Informants receive questionnaires through emails, posts and the answers will be given as per instructions given in the cover letter. Answers in the Schedule method of data collection are filled by research workers/enumerators.
6. In the Questionnaire method, there is no scope for direct personal contact with the respondents. In the Schedule method, there is direct personal contact of the respondents with the enumerators.
7. The cost incurred in the questionnaire method of data collection is economical in comparison with the schedule. The cost is less even if the sample size used is very large. Predominantly the money is spent on preparing questionnaires only. The cost incurred in the Schedule method of data collection is very expensive since there is the cost involved in preparing the schedule, cost incurred on enumerators in addition to the training imparted to them.
8. The coverage of Questionnaire method is large as the questionnaires can even be sent to respondents who are not easily accessible. The coverage of this method is relatively small as there are constraints in sending enumerators to larger areas.
9. In the questionnaire, there is a higher possibility of collecting wrong or incomplete information when respondents are unable to have a clear understanding of the given question.

As everything has two aspects, so as with the case of questionnaire and schedule. The risk of collection of inaccurate and incomplete information is high in the questionnaire, as it might happen that people may not be able to understand the question correctly. On the contrary, schedule faces the risk of biases and cheating of the interviewer.



ISSUES ON FIELD RESEARCH

FIELD RESEARCH:

Field research is defined as a qualitative method of data collection that aims to observe, interact and understand people while they are in a natural environment. For example, nature conservationists observe behavior of animals in their natural surroundings and the way they react to certain scenarios. In the same way, social scientists conducting field research may conduct interviews or observe people from a distance to understand how they behave in a social environment and how they react to situations around them.

Field research encompasses a diverse range of social research methods including direct observation, limited participation, analysis of documents and other information, informal interviews, surveys etc. Although field research is generally characterized as qualitative research, it often involves multiple aspects of quantitative research in it.

Field research typically begins in a specific setting although the end objective of the study is to observe and analyze the specific behavior of a subject in that setting. The cause and effect of a certain behavior, though, is tough to analyze due to presence of multiple variables in a natural environment. Most of the data collection is based not entirely on cause and effect but mostly on correlation. While field research looks for correlation, the small sample size makes it difficult to establish a causal relationship between two or more variables.

Methods of Field Research:

Field research is typically conducted in 5 distinctive methods. They are:

- **Direct Observation:**

In this method, the data is collected via an observational method or subjects in a natural environment. In this method, the behavior or outcome of situation is not interfered in any way by the researcher. The advantage of direct observation is that it offers contextual data on people, situations, interactions and the surroundings. This method of field research is widely used in a public setting or environment but not in a private environment as it raises an ethical dilemma.

- **Participant Observation:**

In this method of field research, the researcher is deeply involved in the research process, not just purely as an observer, but also as a participant. This method too is conducted in a natural environment but the only difference is the researcher gets involved in the discussions and can mould the direction of the discussions. In this method, researchers live in a comfortable environment with the participants of the research, to make them comfortable and open up to in-depth discussions.

- **Ethnography:**

Ethnography is an expanded observation of social research and social perspective and the cultural values of an entire social setting. In ethnography, entire communities are observed objectively. For example, if a researcher would like to understand how an Amazon tribe lives their life and operates, he/she may choose to observe them or live amongst them and silently observe their day-to-day behavior.

- **Qualitative Interviews:**

Qualitative interviews are close-ended questions that are asked directly to the research subjects. The qualitative interviews could be either informal and conversational, semi-structured, standardized and open-ended or a mix of all the above three. This provides a wealth of data to the researcher that they can sort through. This also helps collect relational data. This method of field research can use a mix of one-on-one interviews, focus groups and text analysis.

- **Case Study:**

A case study research is an in-depth analysis of a person, situation or event. This method may look difficult to operate. However, it is one of the simplest ways of conducting research as it involves a deep dive and thorough understanding the data collection methods and inferring the data.

✚ PILOT STUDY BASED ON QUESTIONNAIRE:

The Concise Oxford Thesaurus defines a pilot study as an experimental exploratory, test, preliminary, trial or try out investigation. Pilot test is a trial collection of data to detect weaknesses in design and instrument and provide proxy data for selection of a probability sample. A pilot survey is a mini-survey where the researcher sends out a questionnaire to a smaller sample size compared to the actual target audience. By collecting information from a convenience sample, we can predict the response patterns of participants and make any required changes to our research.

Reasons for Conducting Pilot Study:

The main reasons for conducting a pilot study are:

- **Process:** This assesses the feasibility of the process that are key to the success of the main study
- **Resources:** This deals with assessing time & resource problems that can occur during the main study.
- **Management:** This covers potential human & data management problems.
- **Scientific:** This deals with the assessment of the response, effect & variance of the effect
- **Other Reasons:**
 - Developing & testing adequacy of research instrument
 - Assessing the feasibility of a full scale study /survey

- Establishing whether the sampling frame & technique are effective collecting preliminary data.
- Determining what resources are needed for a planned study
- Assessing the proposed data analysis techniques to uncover potential problems.
- Developing a research question & research plan.
- Convincing funding bodies & other stakeholders that the main study is worth supporting.

Advantages of a Pilot Study:

The advantages of a pilot study are:

- It permits preliminary testing of hypothesis that leads to testing more precise hypotheses in the main study. It may lead to changing some hypotheses, dropping some or developing new hypotheses.
- It often provides the researcher with ideas, approaches & clues the researcher may not have foreseen before conducting the pilot study. Such ideas & clues increase the chances of getting clearer findings in the main study.
- It permits a thorough check of the planned statistical & analytical procedures, giving a researcher a chance to evaluate their usefulness to the data. The researcher may then be able to make needed alterations in the data collecting methods & therefore analyze data in the main study more efficiently.
- It can greatly reduce the number of unanticipated problems because the researchers have all opportunity to redesign parts of his/her study to overcome difficulties that the pilot study reveals.
- It may save lot of time & money. The pilot study almost always provides enough data for the researcher to decide whether to go ahead with the main study.
- In the pilot study, the researcher may try out a number of alternative measures & then select those that produce the clearest results for the cleanest results for the main study.
- The less research experience the student has, the more she/he is likely to benefit from a pilot study. Because of that possibility, the student should attempt a pilot study whenever possible.

Problems of Pilot Study:

- Possibility of making inaccurate predictions or assumptions on the basis of pilot data.
- Completing a pilot study successfully is not a guarantee of the success of the full scale survey. Although pilot study findings may offer some indication of the likely size of response rate in the main survey, they cannot guarantee this because they do not have a statistical foundation & are nearly always based on small numbers.
- A further concern is that of contamination. This may arise in two ways :
 - a) Where data from pilot study are included in the main results
 - b) Where pilot study are included in the main study, but new data are collected from these people.
- A more common problem is deciding whether to include pilot study participants in the main study.

- Problems may also arise where a pilot study requires significant investment and resources, making it difficult for the study team or researcher to call a halt to the research after an unsuccessful pilot study.

ETHNOGRAPHIC FIELD DIARY:

Field Diary:

The field diary is the basic document which contains all the data collected. It refers to qualitative notes recorded by researchers in the course of field research, during or after their observation of a specific phenomenon they are studying. The notes are intended to be read as evidence that gives meaning and aids in the understanding of the phenomenon. Field notes allow the researcher to access the subject and record what they observe in an unobtrusive manner.

Ethnographic Field Note/ Diary:

Ethnographic field note is considered the most important field text collection method in qualitative research, and it is basically a primary method of taking field text for an ethnographic study. In fact, an ethnographic research requires more descriptive and interpretive field text analysis about the researched participants focusing on the cultural aspects in a natural setting. The goal of ethnographic research is thus to formulate a pattern of analysis that makes reasonable sense out of human actions within the given context of specific time and place (Fife, 2005). Thus, an ethnographer applies a different method to address the problem of the research. The best approach to collect empirical field text from the field is by writing field notes. Whether an ethnographer conducts formal interviews, informal interviews, observation, focus group discussions, key informant interviews or overheard conversations, writing the field notes is virtually a significant way for the researcher to record the data (Dewalt & Musante, 2010). If the ethnographers do not write it down in their field notes, recording data may not be possible. Thus, the field note writing is the most important means of documenting field data in an ethnographic research.

In order to record as much as possible, it is important to include as much information as possible in your field notes. Chiseri-Strater and Sunstein (1997) have developed a list of useful things that should be included in all field notes:

- Date, time, and place of observation
- Specific facts, numbers, details of what happens at the site
- Sensory impressions: sights, sounds, textures, smells, taste
- Personal responses to the fact of recording fieldnotes
- Specific words, phrases, summaries of conversations, and insider language
- Questions about people or behaviors at the site for future investigation
- Page numbers to help keep observations in order

There are many other methods by which we can record ethnographic field text. Field notes remain a central method in ethnography even though modern technologies such as cameras and audio recorders may seem to be better at capturing information and easier to use (Madden, 2010). An ethnographer could use modern tools and techniques in writing the field note such as Instagram and Vivo. Many would say that typing notes directly into a laptop is now equivalent to handwriting, and they are probably correct (Madden, 2010).

In the 21st century, researchers have been using many gadgets in the research. To be skillful in ethnographic field notes writing using pen and pencil is still significant for the ethnographers. The ethnographers need to see the context of the field, ethical aspect and technical part of the successful field text collection. The aim of the field work is to produce comprehensive field texts that help to produce a reliable thesis. On the other hand, the development countries are also importing modern technology due to the revolution in digital world. As a result the research participants in the developing countries are also aware of the emerging technology. In light of the problems associated with writing field notes, particularly in the context of interviews, the advantages of audio-recording, and perhaps even video-recording, are obvious (Hammersley & Atkinson, 2008). Despite the revolution in the digital technology there are both challenges and opportunities to use them in the research field. Due to the poor knowledge and skill on the use of modern technology the hand written field note method is still significant in research.

✚ LONGITUDINAL STUDY & CASE STUDY RESEARCH:

❖ LONGITUDINAL STUDY:

A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. As longitudinal studies are observational, there will be no interference with the respondents or subjects if it happens to be a survey. They are unique from other types of research because of their timeline. This means that the same subjects are observed multiple times (often in the course of many years), instead of the researchers trying to collect data from various subjects with the aim to study the same variables. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Types of Longitudinal Research:

There are three major types of longitudinal studies:

- **Panel study:** Involves sampling a cross-section of individuals.
- **Cohort study:** Involves selecting a group based on a specific event such as birth, geographic location, or historical experience.
- **Retrospective study:** Involves looking to the past by looking at historical information such as medical records.

Advantages of Longitudinal Studies:

- One key advantage of performing longitudinal studies is their **ability to show patterns of a variable over time**, which is a very powerful way through which researchers come to learn about the relationships of cause and effect.
- With a **clear focus**, longitudinal studies would see how a particular end state or a set of circumstances would come to be. And though people usually might not remember past events, it can be solved by means of actual recording, thus ensuring a high level of **validity**.
- A longitudinal study is unique in itself in terms of its ability to **provide useful data** about individual changes.
- As most longitudinal studies use the observation method (they observe the state of the world without manipulating it), it has been argued that they may have less power in detecting causal relationships than experiments. However, because of the repeated observations they use at individual levels, they have **more power than cross-sectional observational studies** in terms of being able to exclude time-invariant, unobserved individual differences and in terms of observing a certain event's temporal order.
- A longitudinal study is often used in studying **developmental trends** across life spans and in studying life events throughout generations or lifetimes. This is primarily because, unlike a cross-sectional study, in which different individuals with same characteristics are compared, a longitudinal study would track the same people, thus the differences observed in the group will be less likely to be the result of a cultural difference across generations.
- Because they are perfect for doing research on developmental trends, longitudinal studies can make **observation of changes** more accurate, making them a more preferred method in various fields.
- Longitudinal studies allow for **flexibility** to occur, which means their focus can be shifted while data is being collected.

Disadvantages of Longitudinal Studies:

- One of the biggest drawbacks of performing longitudinal studies is **panel attrition**. If you are only depending on the same group of subjects for a study that takes place once in a while for years, some of these subjects will obviously no longer be able to participate due to various reasons, such as refusal, changes in contact information and death, which cuts down useable data that can be drawn for an ultimate conclusion.
- Another huge drawback to any longitudinal study is the great amount of time it needs to collect all the data that is needed. Usually, it **takes a long period of time** to gather results before you can start making patterns.
- They would gather **data that is not that reliable**. While longitudinal data is collected at multiple points, these observation periods are pre-determined and cannot be taken into account no matter what happens between these points. Aside from this, there is also the idea of panel conditioning, where respondents can often unknowingly change their qualitative responses over time to better fit what they consider to be the intended goal of the observer. The process of longitudinal studies itself has changed how subjects or respondents view the questions used.
- They **require a large sample size**. It means that such studies should have a large number of subjects who are willing to cooperate.
- It is known that **cross-sectional studies are more affordable compared to longitudinal studies**. With fewer touch points, the former are also much quicker in reaching an observational conclusion. Considering they use a carefully chosen sample size, they can be more helpful in representing entire populations, instead of using subsets, which can be very beneficial when it comes to considering a policy change.

❖ CASE STUDY RESEARCH:

A case study is an effective research method that specifically studies a single case over a period of time. Case studies are research methodologies that are used and analyzed in order to depict principles. Case studies seek to explain and give details in the analysis of people and events. Writing a case study is a very useful form of study in the educational process.

Characteristics of Case Study Research:

Particularistic Phenomenon: A case study researcher may specifically choose a particular instance of phenomenon under investigation to understand a specific problem that occurs in everyday practice.

Descriptive Phenomenon: Descriptive phenomenon means that the end result of the case study, the narrative, includes ‘thick description’ of the phenomenon, including many variables and analyses of the interactions.

Heuristic Phenomenon: Heuristic refers to the fact that case studies ‘illuminate the readers’ understanding of the phenomenon under study’ beyond the readers’ original knowledge.

Types of Case Study:

There are 4 types of case studies used for different purposes. The main purpose of case studies is to analyze problems within the boundaries of a specific organization, environment, or situation. According to design, case studies can be divided into the following categories:

- **Illustrative Case Study:** An illustrative case study is used to examine a familiar case in order to help others to understand it. It is one of the main types of case studies in research methodology and is primarily descriptive. In this type of case study, usually, one or two instances are utilized to explain what a situation is like.
- **Exploratory Case Study:** An exploratory case study is a primary project conducted before a large scale investigation. These types of case studies are very popular in the social sciences and primarily focus on real-life contexts and situations. Typically, these are used to identify research questions and methods for a large and complex study. The main purpose of an exploratory case study is to help identify situations for the further research process.
- **Cumulative Case Study:** A cumulative case study is one of the main types of case studies in qualitative research. It is used to collect information from different sources at different times. The aim of this case study is to summarize the past studies without spending additional cost and time on new investigations.
- **Critical Instance Case Study:** Critical instances case studies are used to determine the cause and consequence of an event. The main reason for this type of case study is to investigate one or more sources with unique interest and sometimes with no interest in general. A critical case study can also be used to question a universal assertion.

Types of Subjects of Case Study:

In general, there are four types of case studies and 5 types of subjects they address. Every case study whether exploratory, critical, or cumulative, fits into the following subject categories.

- **Person:** This type of study focuses on one subject or individual and can use several research methods to determine the outcome.
- **Group:** This type of study takes into account a group of individuals. This could be a group of friends, coworkers, or family.
- **Location:** The main focus of this type of study is the place. It also takes into account how and why people use the place.
- **Organization:** This study focuses on an organization or company. This could also include the company employees or people who work in an event at the organization.
- **Event:** This type of study focuses on a specific event. It could be societal or cultural and examines how it affects the surroundings.

Pros & Cons:

There are several pros that back case studies and there are cons too that criticize them. The pros and cons are listed below.

▪ **Pros:**

- They show client observations-Since case studies are strategies that are used and analyzed in order to describe principles therefore it seeks show indeed the client investigated and experienced a particular phenomenon.
- Makes practical improvements-Case studies present facts that categorically describe particular people or events in order to make some of the necessary improvements. Case studies data is what supports a particular belief.
- They are an influential way of portraying something-If a researcher wants to prove a particular principle to be true, he or she must back it by case studies in order to make the other people and the naysayers believe.
- They turn opinions into facts-Case studies present real data on a particular phenomenon. Since, facts about various things are presented then it can be verified through this kind of data if the information presented is in the positive or negative development of opinion.
- It is relevant to all the parties that are involved-Case studies help the researchers in actively focusing on the data collection process and the participants' knowledge is bettered. At the end of the process, everybody is able to defend his position through facts.
- A number of different research methodologies can be used in case the studies-Case study method goes beyond the interview and direct observations. Secondary data can be obtained from various historical sources that can be used to back the method.
- 7. Case studies can be done remotely-It is not essential for a researcher to be present in the specific location of the study in order to effectively use the case study method. Other forms of communication come in to cover that gap for the researcher.
- 8. It has a very high cost-If you put this research method in comparison to the others, this one seems more expensive because the cost of accessing data is very high.
- 9. Readers can access data from this method very easily-The format in which case studies present their data is very useful to the readers and easily note the outcomes of the same.
- 10. Collects data that cannot be collected by another method- The type of data collected by case studies is much richer and greater in-depth than that of the other experimental methods.

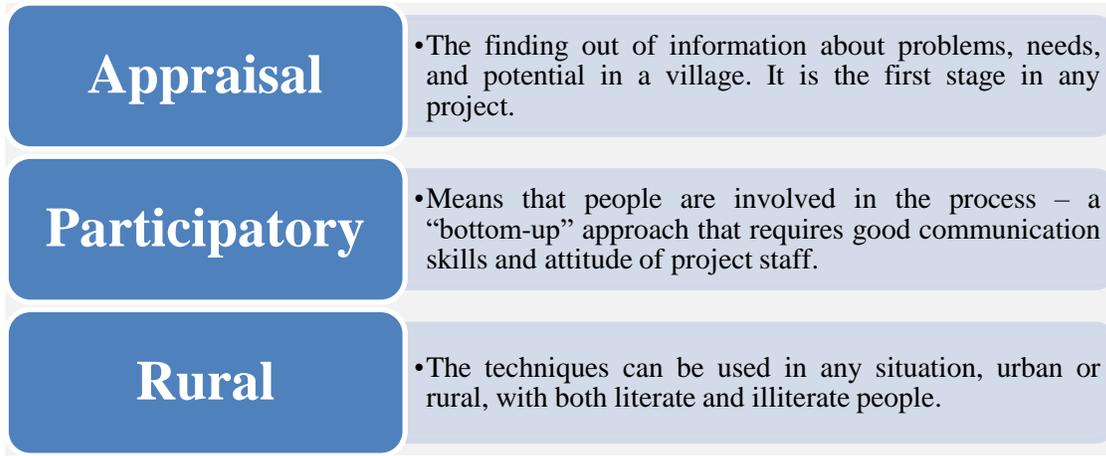
▪ **Cons:**

- Data collected cannot be generalized- The data collected by the case study method was collected from a smaller population it cannot be generalized to the wider population.
- Some of the case studies are not the scientific-The weakness of the data collected in some of the case studies that are not scientific is that it cannot be generalized.
- It is very difficult to draw a definite cause/effect from case studies-The the kind of data that case studies present cannot be used to draw a definite cause-effect relationship.

- Case studies concentrate on one experiment-The problem associated with concentrating on one experiment or a specific group of people is that the data presented might contain some kind of bias.
- It takes a lot of time to analyze the data-This process takes longer to analyze the data because there is a very large amount of data that must be collected. Participants might take a lot of time in giving answers or giving inaccurate information.
- Case studies can be inefficient processes-Sometimes the researchers are not present at the study areas, which means they will not be able to notice whether the information provided is accurate or not terming the whole process inefficient.
- Case study method can only be effective with a small sample size-If a very large sample size is involved in the case study it is likely for it to become inefficient because the method requires a small sample size to get the data and analyze it.
- The method requires a lot of labor in data collection-The researcher is seriously needed in the data collection of this method. They have to be personally involved in order to be able to identify the quality of the data provided.
- There are factors that can influence the data- The method of data collection is meant to collect fact-based data but the power to determine what fact is and what is not is the person who is collecting the data.
- There is no right answer in case studies-Case studies do not present any specific answer that is right, the problem arises in the validation of solutions because there is more than one way of looking at things.

FIELD TECHNIQUES

+ PARTICIPATORY RURAL APPRAISAL:

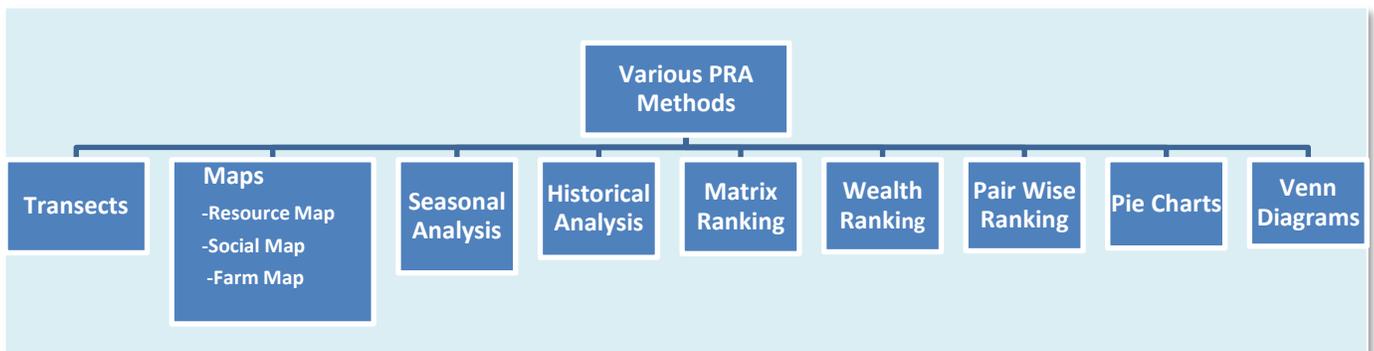


PARTICIPATORY RURAL APPRAISAL or PRA:

It is considered one of the popular and effective approaches to gather information in rural areas. Participatory Rural Appraisal was first developed in India and Kenya during the 1980s; it has been mainly used by non-governmental organizations (NGOs) working on the grass-root level. This approach was developed in early 1990s with considerable shift in paradigm from top-down to bottom-up approach, and from blueprint to the learning process. PRA is based on village experiences where communities effectively manage their natural resources. PRA is a methodology of learning rural life and their environment from the rural people. It requires researchers / field workers to act as facilitators to help local people conduct their own analysis, plan and take action accordingly. It is based on the principle that local people are creative and capable and can do their own investigations, analysis, and planning. The basic concept of PRA is to learn from rural people.

DEFINITION- CHAMBERS (1992): PRA as an approach and methods for learning about rural life and conditions from, with and by rural people. He further stated that PRA extends into analysis, planning and action. PRA closely involve villagers and local officials in the process.

VARIOUS PRA METHODS:



Transect Walk

- This involves walking with the villagers through the village and discussing about different aspects of land and water in the village during the walk.
- This enables the outsider to observe different aspects of rural environment and helps in getting in-depth information about problems and opportunities as well as their interpretations.
- The walk also reveals view about Natural resources; is it resource rich/poor village?

Seasonal Analysis

- Each season has specific problems and influences on rural life.
- It affects the availability of food, water, fuel, fodder, etc. this influences their living conditions.
- Here, villagers prepare diagrams and charts of socio-economic and physical phenomenon.

Historical Analysis

- Various diagramming techniques can help explore changes in: rainfall, labor demand, farming (fishing, hunting, herding) activities, wood supply for fuel, disease incidence, migration for employment, food stocks and many other elements that change over time. The diagrams you produce can be used as a basis for discussions for the reasons behind changes and implications for the people involved.

Matrix Ranking

- Matrix ranking is used to list items to be compared along horizontal line and criteria on the vertical line to rank choices from most important to least important (i.e. 1st, 2nd, 3rd, 4th etc) In this case frequency of the items valued as the 1st choice helps to make up a final decision.

Wealth Ranking

- Wealth ranking is a method to understand relative wealth with in a specific area and community. It is a method to learn about local criteria of well-being.
- Wealth ranking provides a way to identify information from different social and economic groups to produce a baseline against which future intervention impact can be measured.
- Wealth ranking is a sensitive issue to discuss with every member of the community

Pair-Wise Ranking

- Here, two items are used at a time for ranking and can be used to explore rural people's criteria for choosing one alternative over the other.
- At the end, most favorable choice or problem is identified.

Venn Diagrams

- In this Diagram, circles of different sizes represent an individual or institution whose size shows degree of its importance in decision making.

Maps:

- The purposes of a map or is a visual representation of what the community perceives as their community space.
- This include showing the shape (appearance) of the community, boundary and all the major features as understood and known by the community.
- The map shows where resources, activities, problems and opportunities are located as well as the dimension and scope of issues to be investigated.
 - **Resource Maps**
 - Resource maps are drawn by the people to show natural resource of an area, location and use of natural resources.
 - - fields and land uses
 - - physical land features
 - - water location, quality and use
 - - soil types, uses, location etc.
 - **Social Maps**
 - Specific type of map representing households according to certain indicators.
 - - Social Maps Indicates where people live and how many people live in an area
 - - Social and residential differences in status and wealth
 - - Buildings where people live or work, uses of space in a house
 - **Farm Maps**
 - It is an idea tool for knowing the details of the farm, soil condition, water management, fertilizer use and yields.
 - A villager is asked to draw a map to show the crop grown on his farm and the location of the farm.

Importance of Participatory Rural Appraisal:

As PRA, basically came into existence in response to the disappointments and the criticism of the assumptions upon which earlier development work of planning and implementation was based, PRA has

the added advantage of participation of local people which positively affects the planning, documentation and implementation of a program.

Following are some of the advantages of PRA which makes it important for a program.

- **Target group's real priorities are identified:** In PRA, the target group i.e. local people are asked about the immediate problems, that they are facing. The outsiders do not impose their own solutions on these problems; rather they explore the solutions with the local people in which they are really interested.
- **Delegation of responsibilities:** PRA encourages self-reliant development with most of the responsibilities to manage and execute the developmental activities done by local people. This creates a sense of ownership and enthusiasm among the local people and thus the efficiency to achieve the goal also increases.
- **Motivation of local development workers:** The local development workers of non-governmental organizations, government or other agencies, who are involved in the developmental projects or programs, get motivated through their participation in PRA activities, by knowing the grass-root level problems and priorities of the people. PRA helps to ensure better understanding and commitment of local workers; in return people at administrative and organizational levels also become aware about the requirements and priorities of workers and community.
- **Use of local resources:** PRA encourages participation of the local people and they design the activities by keeping in mind the availability of the resources that are present in their surroundings. This makes complete use of existing local resources like manpower, time, material resources and others.
- **Sustainable developmental activities:** As local people plan and execute the activities themselves and which are technically, environmentally, socially and financially appropriate to local conditions, which lead to more sustainable developmental activities.
- **Brings desirable behavioural changes:** PRA methods encourage participation by providing visual basis like resource map, which stimulates the thought process and encourages local people to offer their views which are appreciated and included in the activities, increasing their confidence to participate more.
- **Use of indigenous knowledge:** Every community has an indigenous knowledge system which it acquires through work experience and solves problems in its own specific situations. This knowledge is shared by the local people of community while participating in the activities.
- **PRA is also important because:**
 - It provides basic information where little is known.
 - Getting a better picture of needs and ability of the organizations to meet them.
 - Developing and transferring appropriate technologies.
 - Planning projects that are more relevant, restructuring administration, assisting in decision-making and policy formulation.
 - Providing guidelines for survey
 - It helps in individual and collective decision making and problem solving
 - Participation by the proper elements presents the 'Hijacking' of programme benefit selection of the community.

DISADVANTAGES:

- Raising expectations which cannot be realized
- Many a times, the poor or socially backward people may not get properly represented
- Risk of “capture” of activities by local interests
- Failure to take account of stratification in communities

✚ FOCUS GROUP DISCUSSION:

A focus group is best defined as a small group of carefully selected participants who contribute to open discussion for research. A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes believes opinion or ideas.

The group's composition and the group discussion should be carefully planned to create a non-intimotating environment so the participants feel free to talk openly and give honest opinions. Since participants are actively encouraged to not only express they are own opinions, but also respond to other members and questions posed by the leader focus groups offer a depth, nuance and variety to the discussion that would not be available through surveys.

Additionally as focus group discussions are structured and directed, but also expressive, they can yield a lot of information in a relative Lee short time. Therefore, FGDs are a good way to gather in-depth information about a community's thoughts and opinions on a topic. The course of the discussion is usually planned in advance and most moderators rely on an outline, or guide, to ensure that all topics of interest are covered.

Key Features of FGDs:

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic.
- Particularly suited for obtaining several perspectives about the same topic.
- In FGDs, participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants.
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation.
- It generally involves group interviewing in which a small group of usually 8 to 12 people. It is lead by a moderator (interviewer) in a loosely structured discussion of various topics of interest.
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

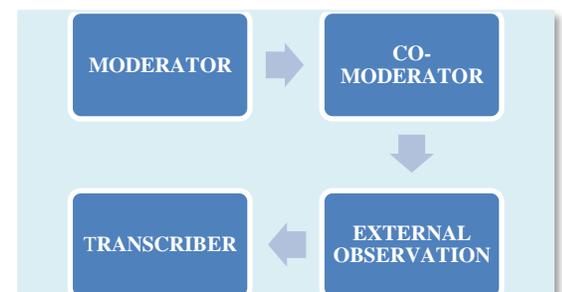
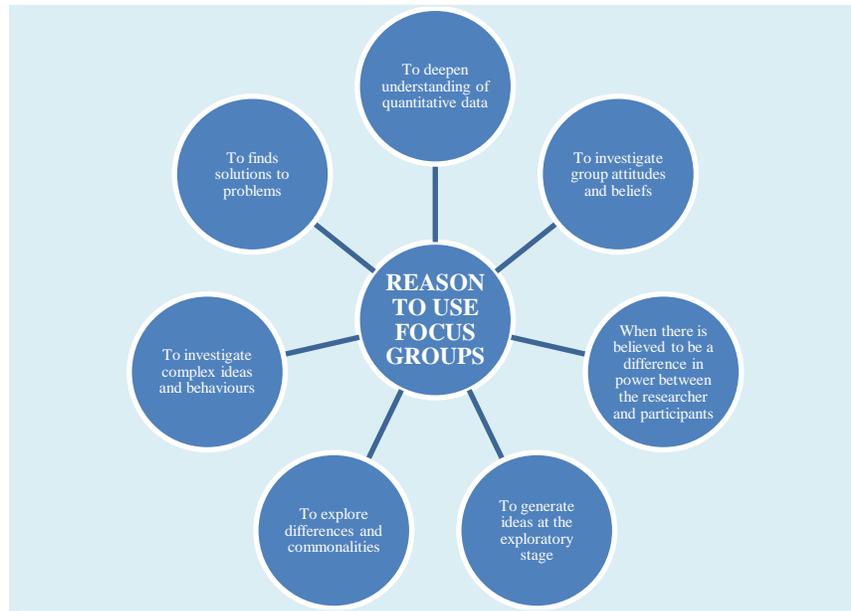


Figure: Team Members of FGDs

- The participants usually have shared social and cultural experiences (such as age, gender, religion, social class etc.) or shared particular areas of concerned (such as divorce, marriage, motherhood, childbirth, infant feeding, nutrition, mental health etc.).



Advantages of FGDs:

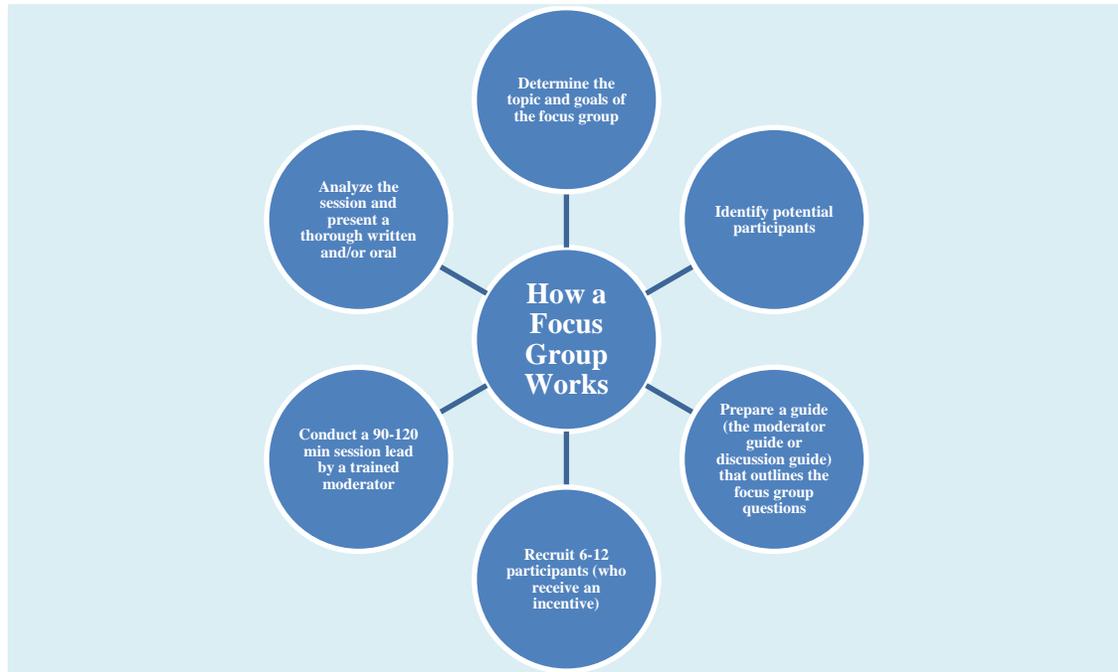
The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents result in generation of new ideas that can be very useful for decision making.
- Focus groups can be relatively low cost and provide quick results. The actual time and cost for planning, conducting and analyzing data may be relatively small when compared to alternative such as survey projects and individual interviews.
- Focus groups are a flexible assessment tool. Interactions between the moderator and participants allowed the moderator to probe issues in depth, address new issues as they arise, and to ask participants to elaborate on their responses.
- Participants may be more comfortable talking in a group than in an individual interview. Interactions can generate more discussion and therefore, more information.
- The data is in the respondents' own wards. It is easily understood and will provide insights into how respondents think about the topic.
- It captures real life information in a social environment and it has a high face validity.

Disadvantages of FGDs:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.

- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projection or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.
- The researcher has less control than individual interviews.



POST FIELD TECHNIQUES

Methods of Report Writing:

A report is a document that presents the results of an investigation, project or initiative. It can also be an in-depth analysis of a particular issues or data set. The purpose of a report is to inform, educate and present options and recommendations for future action. Reports are an integral element of dozens of industries, including science, healthcare, criminal justice, business and academia. Reports typically consist of several key elements, including—

1. Detailed summaries of activities
2. Analysis of the impact of the event
3. Evolutions of the facts and data
4. Predictions for what may happen as a result of an event
5. Recommendation for next course of action
6. Conclusion

Ethnographic field note -----

Ethnographic fieldwork is how anthropologists gather data. Fieldwork is the process of immersing oneself in as many aspects of the daily cultural lives of people as possible in order to study their behaviors and interactions. Ethnography is most useful in the early stages of a user-centered design project. This is because ethnography focuses on developing an understanding of the design problem. Therefore, it makes more sense to conduct ethnographic studies at the beginning of a project in order to support future design decisions. Common ethnographic data collection method are----

1. Participant observation: participant observation is the quintessential fieldwork method in anthropology. Anthropologists use various degrees of participant observation, from full participation in ongoing activities to passive observation within the locations of interest. Participant observation is useful at multiple stages of an evaluation.

- Initially to identify issues that need to be explored with other data collection methods.
- Ongoing as process evaluation.
- Following other types of data collection, to triangulate earlier findings and directly observe the specific phenomena that participants have spoken about.

2. Focus Groups: The focus group is a group interview method useful to obtaining information on relatively unstudied topics for which the full range of relevant domains is not known and the dynamic interaction among participants is of interest. Researchers chose focus groups over individual in-depth interviews when data acquisition will benefit from the dynamic that is created though group discussion. The discussion often elicits information and insights that might not be gained from an individual interview, including the colloquial ways in which participants speak with one another about working in or seeking care from the practice.

AUDIO-VIDEO RECORDINGS:

Audio/video is an observation-recording tool that can be employed by researchers to record, review and analyze user behavior or actions in specific scenarios. Audio/video can be easily combined with other design research methods such as interviews, guided tour, task analysis, to record user experience or interaction with a prototype, a digital or non-digital product and services.

A video is a series of pictures stitched together to give the impression of continuous motion. A video normally comprises of 24-30 frames per second (fps) which means that a 5 – second video shot at 15 fps, is made up of 75 photos (frames). A normal video, which is played back at the same frames per rate as it is recorded, also has an audio component.

In many studies, audio, as well as video, these are recorded to capture a process, interaction or a scenario. In situations where the visual aspect that a video brings is either more expensive to shoot or doesn't add significant value to the study, researchers usually use an audio recording. This recorded data is then analyzed to understand what happened at the time of the recording.

Methods to conduct Audio/ Video analysis research

The equipment required to record the voice memos or videos is a camera (many phone cameras come equipped with time-lapse recording capabilities), a tripod and a remote. This equipment can be set-up in the same scenario with different users or different scenarios with the same users or user groups. The researcher and the videographer can be different. In situations where the researchers presence is either not required or could affect the participant's behavior, an audio/video recording mechanism may be set-up in advance, the media can be recorded during the activity and the researcher can listen or view the recording later.

A number of techniques can be employed to analyze audio and visual data to study the interaction between people, digital and non-digital products and prototypes. The choice of technique depends on what line of inquiry the researcher wishes to take. Both of the audios, as well as video, data allow researchers to collect and analyze data, and disseminate findings to a wide variety of audiences.

Advantages of Audio/Video Analysis:

- **Large sample sizes:** Audios/videos can be recorded for a large number of individuals at the same time for the same or different scenarios; the only requirement is the equipment accompanying the researcher or independent of the researcher.
- **Researcher presence:** In cases where a senior researcher needs to be present for a certain observation but is unable to attend a session, the session can be recorded for the researcher to review later and document their findings.
- **No researcher influences:** In cases where the recording is done independent of the researcher, the researcher cannot influence the user's behavior or interactions.
- **Missed details:** In cases where the researcher was present during the recording, any details that the researcher could have missed can be reviewed and documented when reviewing the audio/video.

Disadvantages of Audio/Video Analysis:

- **Time-consuming and costly:** The review and analysis of audios/videos is time-consuming. Again, with more number of audios/videos to record, the requirement for equipment and audio recorders/videographers goes up. Similarly, in case the user groups or individual users being shot are experts, they'll charge a fee to participate in the research.
- **No probing:** In cases where the researcher isn't present at the time of shooting the audio/ video, if later the researcher spots an interesting action performed by the users, there is no possibility of probing the user further.
- **Researcher attitudes:** In some studies, when the researcher is aware that an audio/video is being recorded, they can become relaxed during the session because any missed detail can be revisited when reviewing the recorded media.

✚ PARTICIPANT OBSERVATION:

Participant observation is a qualitative research method in which the researcher not only observes the research participants, but also actively engages in the activities of the research participants. This requires the researcher to become integrated into the participants' environment while also taking objective notes about what is going on. Most researchers who conduct participant observations take on the role that they are interested in studying.

There are three important pieces of participant observation:

- Gaining entry into the location you wish to study
- Establishing rapport with the research participants under investigation
- Making sure you spend enough time with the research participants in the environment to get a sufficient amount of data for your study

Reason to Use Participant Observation:

There are many reasons that researchers choose to use participant observation. Participant observation provides the researcher with access to different types of information that may not be easily accessible to outsiders. For example, students who are not enrolled in the foreign language class may not know what the rules and expectations are like in the classrooms or the nature of the interactions between the students and the teacher.

Participant observers integrate themselves into the environment and are often considered part of the culture and group. It is not uncommon for research participants to forget that they are being observed, which reduces the likelihood that research participants will modify their behavior or try to 'act well' because they are being observed. They might consider Jill a part of the group and act as they normally would around her.

Participant observations help the researcher decide which questions are relevant, what language to use, and what the culture is like. By being a part of the group, Jill can get a better feel of what is important to the research participants. She can also pick up on the language that they use and what certain words mean. If Jill decided to conduct research interviews later, she could use her background knowledge of the participants to help her create research questions.

Four different positions on a continuum of participant observation roles are:

- Complete participant.
- Participant-as-observer.
- Observer-as-participant.
- Complete observer.

- **Complete Participant:** This is a fully embedded researcher, almost like a spy. Here the observer fully engages with the participants and partakes in their activities.

Participants aren't aware that observation and research is being conducted, even though they fully interact with the researcher. This has sometimes been referred to as "going native," in reference to performing indigenous fieldwork.

- **Observer as Participant:** Here the researcher is known and recognized by the participants and in many cases, the participants know the research goals of the observer.

There is some interaction with the participants but the interaction is limited. The researcher's aim is to play a neutral role as much as possible.

This approach is generally used when "following a customer home" to understand how someone uses software products to accomplish goals.

- **Participant as Observer:** Here the researcher is fully engaged with the participants. She is more of a friend or colleague than a neutral third party. While there is full interaction with participants, they still know that this is a researcher. This method is often used when studying remote indigenous populations or inner-city cultures.

- **Complete Observer:** This is a detached observer where the researcher is neither seen nor noticed by participants. It's one way of minimizing the Hawthorne Effect as participants are more likely to act natural when they don't know they're being observed.

While this was once considered an objective role for the ethnographer, it's fallen out of favor because it's the role most likely to raise ethical questions about possible deception.

**TECHNIQUES &
FORMULATION OF
RURAL
PLANNING
THROUGH DATA**

APPLICATION OF QUALITATIVE RESEARCH TECHNIQUES

STAKEHOLDER ANALYSIS

A **stakeholder analysis** is a process of identifying these people before the project begins; grouping them according to their levels of participation, interest, and influence in the project; and determining how best to involve and communicate each of these stakeholder groups throughout.

PURPOSE OF STAKEHOLDER ANALYSIS

Project managers, program managers, and product managers alike may conduct a stakeholder analysis for several strategic reasons, including:

1. To enlist the help of key organizational players.

By approaching company influencers, executives, or valuable stakeholders for help early in your project, you can leverage the knowledge and wisdom of these key players to help guide the project to a successful outcome. Enlisting these players early on will also increase the chances you will earn their support for your project.

But before you can determine which influencers and other key stakeholders to approach, you'll need to conduct a stakeholder analysis.

2. To gain early alignment among all stakeholders on goals and plans.

Because your stakeholder analysis will help you determine which people to involve in the project, you will then be able to bring these people together for a kickoff and early-stage meetings to communicate the project's strategic objectives and plans.

[Over a third of product managers in 2021, wish they had a clearer purpose and company strategy.](#) A stakeholder analysis will help ensure everyone starts the project with a clear understanding of what success will look like and how they can contribute to that successful outcome.

3. To help address conflicts or issues early on.

Without a stakeholder analysis, you and your team could be well into a company project before you realize a key person in your organization—perhaps an executive—does not see the value of your initiative, or would prefer to redeploy some of your resources to other projects. Such a person might actively work to thwart or derail your project.

If you had conducted a stakeholder analysis before you began, you would have likely identified this executive as potentially important to your project's success. You could have then presented your plan to the executive, listened to their objections, and worked to earn their approval to proceed.

IMPORTANCE OF CONDUCTING STAKEHOLDER ANALYSIS

Conducting a stakeholder analysis can be strategically valuable when kicking off any type of complex company undertaking. The more stakeholders you can identify early on and the more you can tailor your communication to win approval and support from various stakeholders, the more likely your project is to succeed.

But if you consider how much of an organization is either involved in or affected by the development of a product—engineering, design, procurement, sales, marketing, product, finance, accounting, customer success, etc.—you can understand why stakeholder analysis is an essential exercise for a product manager.

After all, the way you manage the many stakeholders across your company whose jobs your product could impact—starting with identifying them through a stakeholder analysis—could mean the difference between these stakeholders enthusiastically helping your product’s development or trying to block its progress.

STEPS OF CONDUCTING STAKEHOLDER ANALYSIS

Stakeholder analysis exercises will vary by company, industry, and the teams conducting them (e.g., project management vs. product management). But there are useful steps common to most of these types of analyses. Here’s how many organizations conduct a stakeholder analysis.

Step 1: Determine who your stakeholders are.

Start by brainstorming with your team a list of all possible stakeholders for your project. Of course, you can reduce this list later, but you don’t want to miss a potentially pivotal stakeholder at this early stage.

The list of potential stakeholders could include:

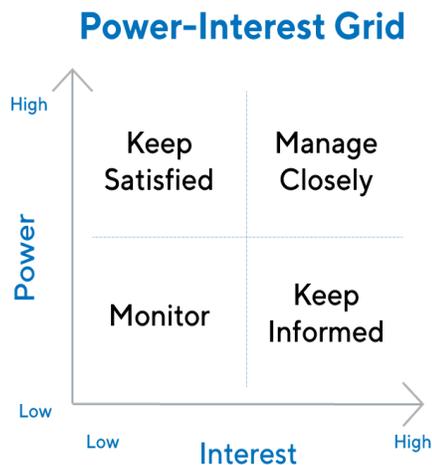
- Executive staff
- Marketing
- Sales
- Finance
- Product
- Development/engineering/manufacturing
- Procurement
- The heads of all affected business units
- Consultants
- Operations/IT

Step 2: Group and prioritize these stakeholders.

After you've completed your brainstorming session above and determined which people and teams will indeed be stakeholders, you should start categorizing them in terms of their influence, interest, and levels of participation in your project.

One example of how to do this is by using the [power/interest grid](#).

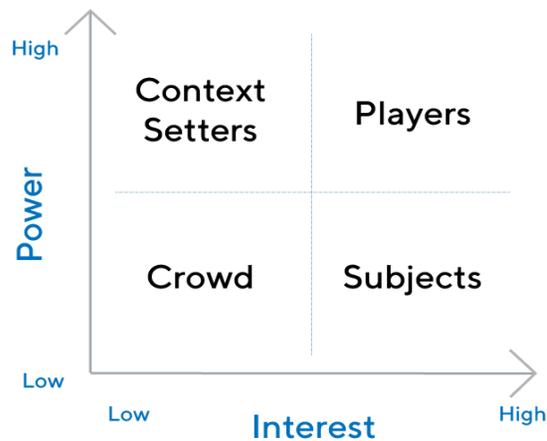
As you can see, you will group stakeholders into four categories:



1. **High power, high interest:** These are your most important stakeholders, and you should [prioritize](#) keeping them happy with your project's progress.
2. **High power, low interest:** Because of their influence in the company, you should work to keep these people satisfied. But because they haven't shown a deep interest in your project, you could turn them off if you over-communicate with them.
3. **Low power, high interest:** You'll want to keep these people informed and check in with them regularly to make sure they are not experiencing problems on the project.
4. **Low power, low interest:** Just keep these people informed periodically, but don't overdo it.

Another approach, popularized in the book [Making Strategy: Mapping Out Strategic Success](#), groups stakeholders into four different but similar categories.

Power-Interest Grid



1. **Players:** These are the high-power, high-interest individuals with whom you will want to collaborate and keep fully engaged.
2. **Subjects:** These are the low-power, high-interest stakeholders who can offer great insights and ideas for the project but whom you don't need to always say yes to.
3. **Context-setters:** These high-power, low-interest stakeholders (heads of departments, for example) can have a lot of influence over the project but don't want to be involved in the details. Keep them up to date.
4. **Crowd:** Finally, the low-power, low-interest stakeholders are called the crowd. These individuals will require some ongoing communication about the project's progress but probably the least of all stakeholders.

Step 3: Figure out how to communicate with and win buy-in from each type of stakeholder.

Once you've built your list detailing which stakeholders fall into which category, it's time to think strategically about how best to earn the ongoing support of each of these stakeholder types. First, you will want to ask yourself questions about your stakeholders such as:

- What motivates this stakeholder?
- What other priorities do they have, and how can we align our project with those priorities (or at least ensure the project won't threaten them)?
- Will this stakeholder likely have a positive view of our project? If not, what can we do about it?

After you've built out these profiles of each stakeholder type, you're ready to begin the next phase of the stakeholder management process—developing your stakeholder communication plan.

SWOT ANALYSIS

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a [company's competitive position](#) and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription.

FEATURES:

- SWOT analysis is a strategic planning technique that provides assessment tools.
- Identifying core strengths, weaknesses, opportunities, and threats leads to fact-based analysis, fresh perspectives, and new ideas.
- SWOT analysis works best when diverse groups or voices within an organization are free to provide realistic data points rather than prescribed messaging.

SWOT Analysis

SWOT analysis is a technique for assessing the performance, competition, risk, and potential of a business, as well as part of a business such as a product line or division, an industry, or other entity.

Using [internal and external data](#), the technique can guide businesses toward strategies more likely to be successful, and away from those in which they have been, or are likely to be, less successful. Independent SWOT analysts, investors, or competitors can also guide them on whether a company, product line, or industry might be strong or weak and why.

Strengths

Strengths describe what an organization excels at and what [separates it from the competition](#): a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favorable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and [market share](#).

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.

SWOT Table

Strengths

1. What is our competitive advantage?
2. What resources do we have?
3. What products are performing well?

Threats

1. What new regulations threaten operations?
2. What do our competitors do well?
3. What consumer trends threaten business?

Weaknesses

1. Where can we improve?
2. What products are underperforming?
3. Where are we lacking resources?

Opportunities

1. What technology can we use to improve operations?
2. Can we expand our core operations?
3. What new market segments can we explore?

METHODS

Internal

What occurs within the company serves as a great source of information for the strengths and weaknesses categories of the SWOT analysis. Examples of internal factors include financial and human resources, tangible and intangible (brand name) assets, and operational efficiencies.

Potential questions to list internal factors are:

- (Strength) What are we doing well?
- (Strength) What is our strongest asset?
- (Weakness) What are our detractors?
- (Weakness) What are our lowest-performing product lines?

External

What happens outside of the company is equally as important to the success of a company as internal factors. External influences, such as monetary policies, market changes, and access to suppliers, are categories to pull from to create a list of opportunities and weaknesses.¹

Potential questions to list external factors are:

- (Opportunity) What trends are evident in the marketplace?
- (Opportunity) What demographics are we not targeting?
- (Threat) How many competitors exist, and what is their market share?
- (Threat) Are there new regulations that potentially could harm our operations or products?

Use a SWOT analysis to identify challenges affecting your business and opportunities that can enhance it. However, note that it is one of many techniques, not a prescription.

SWOT Analysis Example

In 2015, a Value Line SWOT analysis of The Coca-Cola Company noted strengths such as its globally famous brand name, vast distribution network, and opportunities in emerging markets. However, it also noted weaknesses and threats such as foreign currency fluctuations, growing public interest in "healthy" beverages, and competition from healthy beverage providers.²

Its SWOT analysis prompted Value Line to pose some tough questions about Coca-Cola's strategy, but also to note that the company "will probably remain a top-tier beverage provider" that offered conservative investors "a reliable source of income and a bit of capital gains exposure."

Five years later, the Value Line SWOT analysis proved effective as Coca-Cola remains the 6th strongest brand in the world (as it was then). Coca-Cola's shares (traded under ticker symbol KO) have increased in value by over 60% during the five years after the analysis was completed.

To get a better picture of a SWOT analysis, consider the example of a fictitious organic smooth company. To better understand how it competes within the smoothie market and what it can do better, it conducted a SWOT analysis. Through this analysis, it identified that its strengths were good sourcing of ingredients, personalized customer service, and a strong relationship with suppliers. Peering within its operations, it identified a few areas of weakness: little product diversification, high turnover rates, and outdated equipment.

Examining how the external environment affects its business, it identified opportunities in emerging technology, untapped demographics, and a culture shift towards healthy living. It also found threats, such as a winter freeze damaging crops, a global pandemic, and kinks in the supply chain. In conjunction with other planning techniques, the company used the SWOT analysis to leverage its strengths and external opportunities to eliminate threats and strengthen areas where it is weak.

APPLICATION OF STATISTICAL TECHNIQUES IN DEMOGRAPHIC DATA ANALYSIS

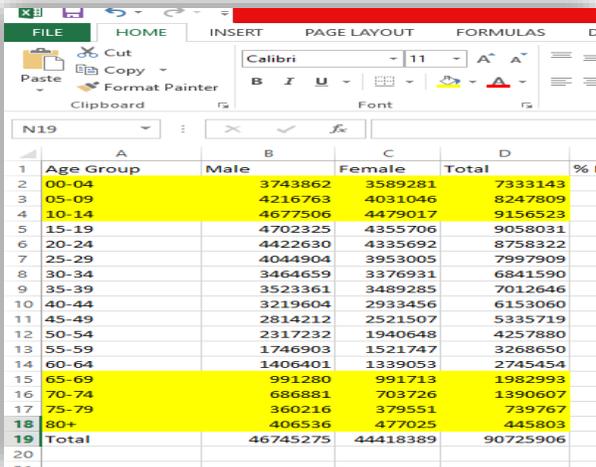
POPULATION COMPOSITION:

Population composition refers to the structure of the population. Population composition helps to know the number of males or female, their age-groups, literacy, their occupation, their income level and health conditions etc. **Population composition** is the description of a **population** according to characteristics such as age and sex. These data are often compared over time using **population** pyramids.

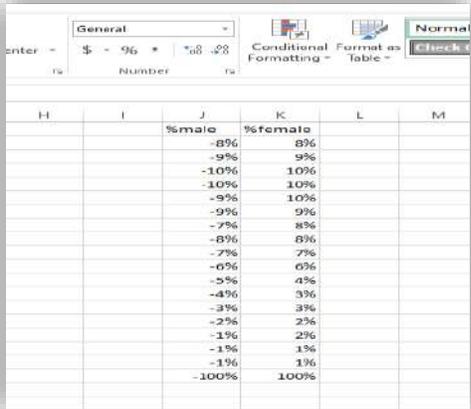
POPULATION PYRAMID: Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays in each five year age group are represented using horizontal bars. Population pyramid of countries can differ markedly as a result of past and current patterns of birth rates, death rates, and migration.

STEPS TO MAKE POPULATION PYRAMID:

1. put the data on excel sheet



	A	B	C	D	E
	Age Group	Male	Female	Total	% f
2	00-04	3743862	3589281	7333143	
3	05-09	4216763	4031046	8247809	
4	10-14	4677506	4479017	9156523	
5	15-19	4702325	4355706	9058031	
6	20-24	4422630	4335692	8758322	
7	25-29	4044904	3953005	7997909	
8	30-34	3464659	3376931	6841590	
9	35-39	3523361	3489285	7012646	
10	40-44	3219604	2933456	6153060	
11	45-49	2814212	2521507	5335719	
12	50-54	2317232	1940648	4257880	
13	55-59	1746903	1521747	3268650	
14	60-64	1406401	1339053	2745454	
15	65-69	991280	991713	1982993	
16	70-74	686881	703726	1390607	
17	75-79	360216	379551	739767	
18	80+	406536	477025	445803	
19	Total	46745275	44418389	90725906	



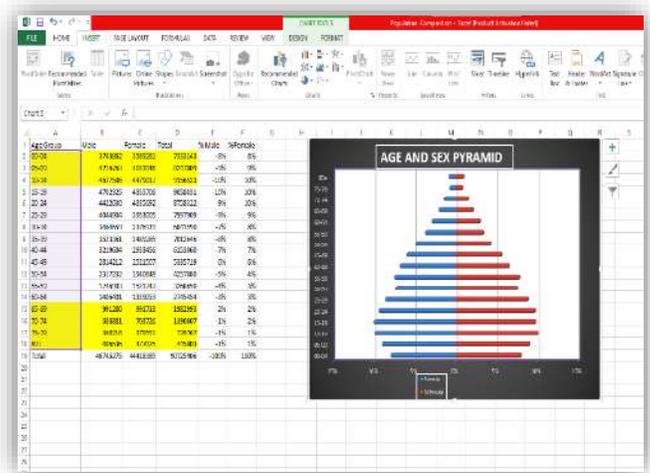
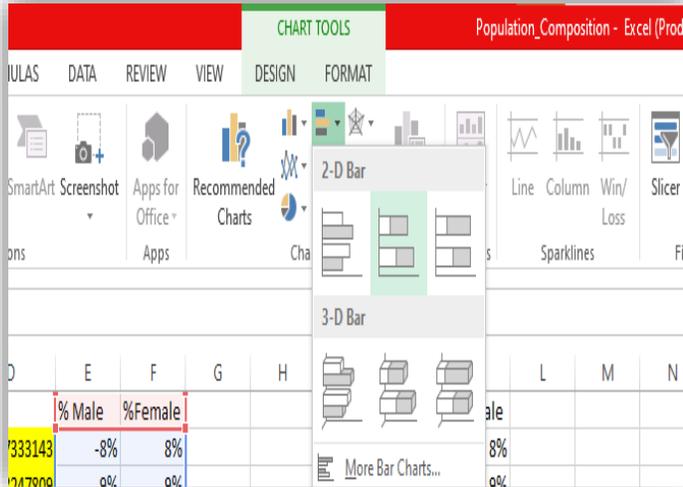
	H	I	J	K	L	M
			%male	%female		
			-8%	8%		
			-9%	9%		
			-10%	10%		
			-10%	10%		
			-9%	10%		
			-9%	9%		
			-7%	8%		
			-8%	8%		
			-7%	7%		
			-6%	6%		
			-5%	4%		
			-4%	3%		
			-3%	3%		
			-2%	2%		
			-1%	2%		
			-1%	1%		
			-1%	1%		
			-100%	100%		

2. Calculate the % of the male and female population from the data

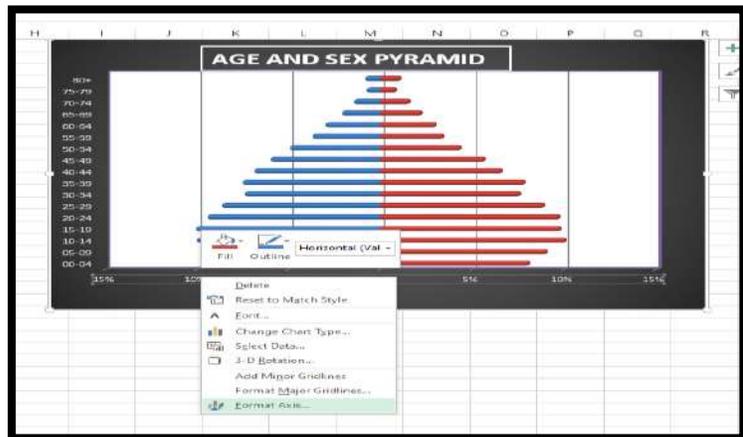
3. After Calculating the % of the male and female population from the data select the age group with both male and female % population

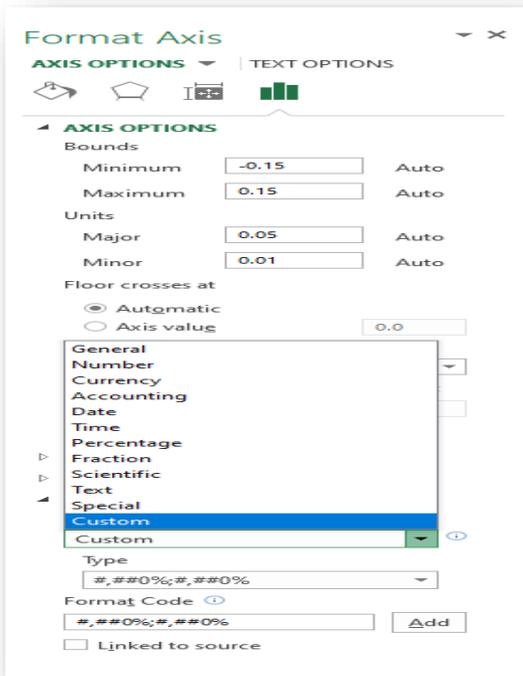
Age Group	Male	Female	Total	% Male	%Female
00-04	3743862	3589281	7333143	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%
65-69	991280	991713	1982993	-2%	2%
70-74	686881	703726	1390607	-1%	2%
75-79	360216	379551	739767	-1%	1%
80+	406536	477025	445803	-1%	1%
Total	46745275	44418389	90725906	-100%	100%

4. Go to insert select a suitable bar



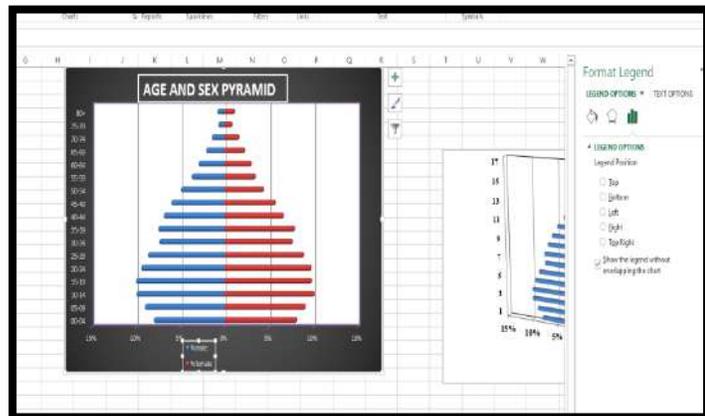
5. after your age and sex pyramid was appear you have to remove the (-) portion from the horizontal plane>right click on it > format axis

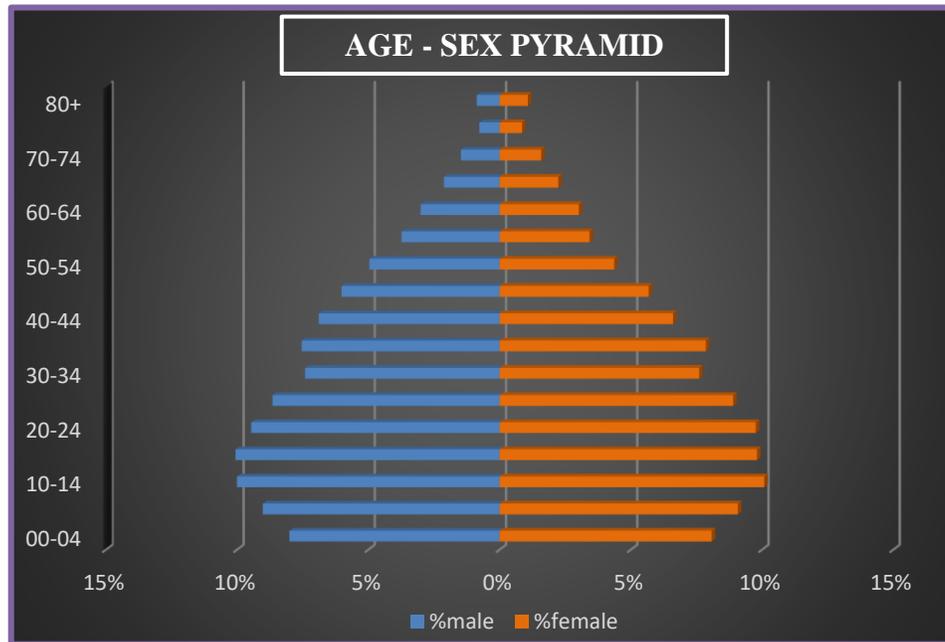




6. than this type of tool box was open > go to number> click on customs

7. Add title , legend etc. by using format legend tool bar





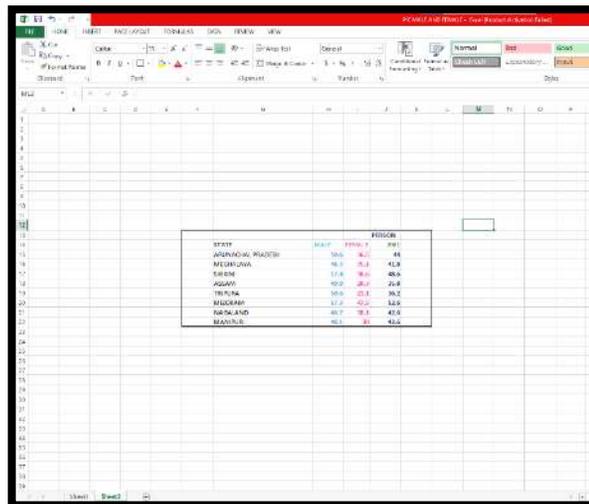
INTERPRETATION:

The above diagram shows the population pyramid which display age group that are represented using horizontal bar. On the vertical axis we have plotted age group. And on the horizontal axis we have plotted percentage of male and female population.

Thus from the above diagram we can interpret that ratio between male and female is almost same. The age group between 10-24 years has the highest population. The age group between 70-80 years (dependent population) having lowest population. The child dependent population has larger population than the older dependent population. Thus the population increases from the age group 10 to 24 and then it can decreases.

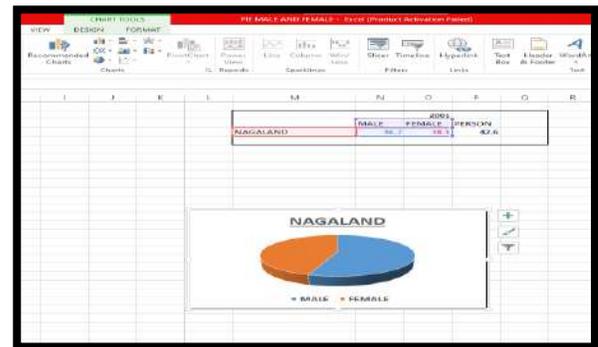
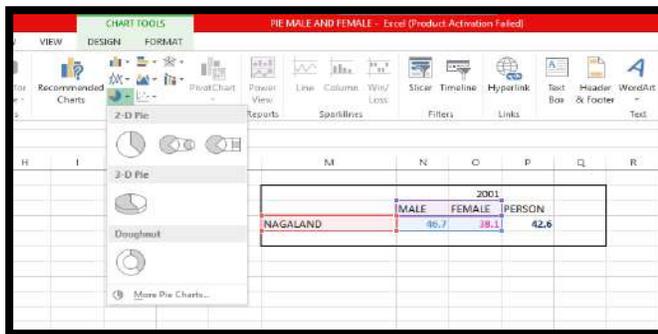
STEPS TO MAKE POPULATION COMPOSITION USING PIE DIAGRAM:

1. input the data in a excel sheet

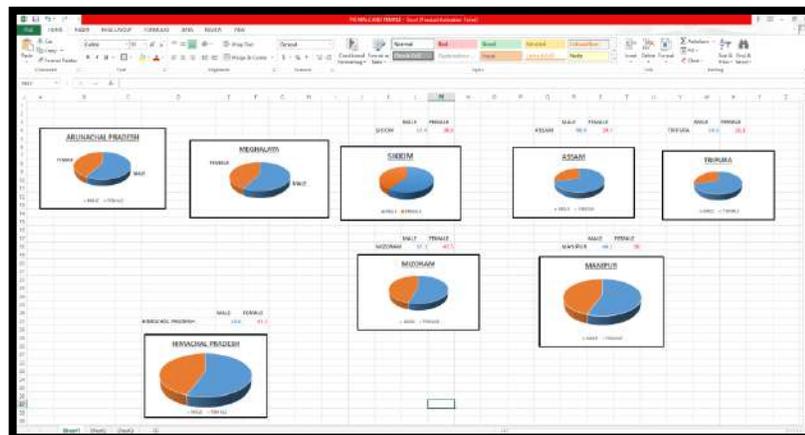


2. Select any particular data with male and female > insert pie

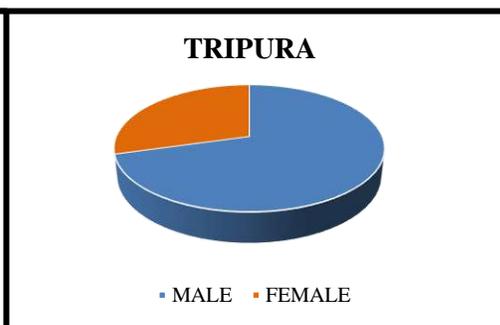
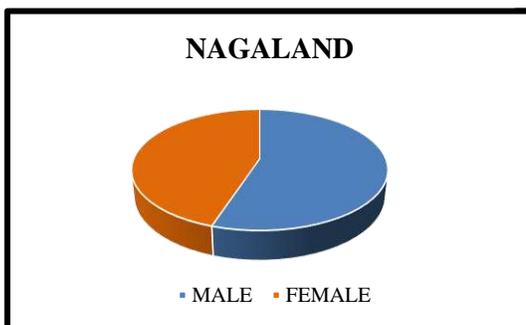
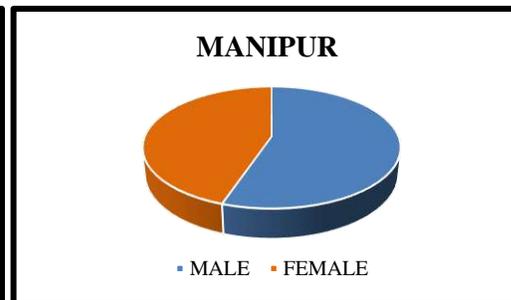
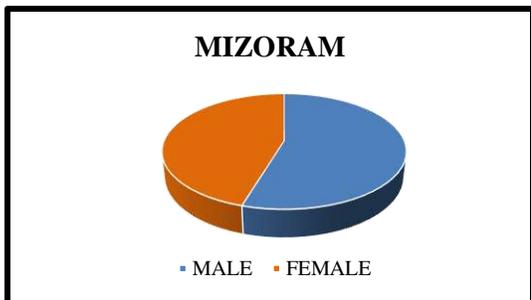
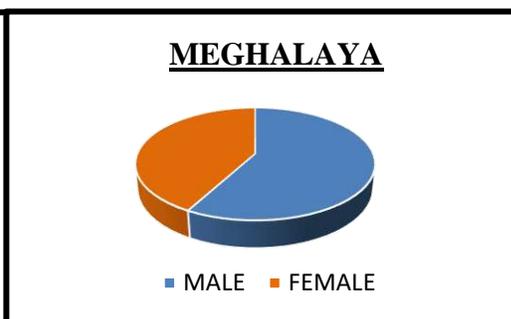
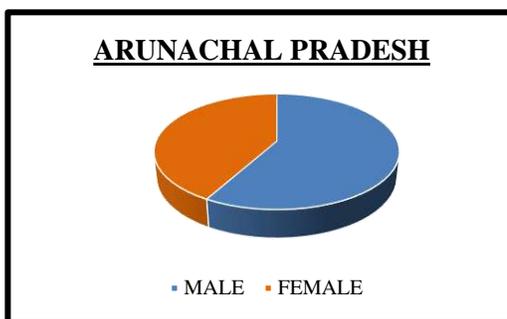
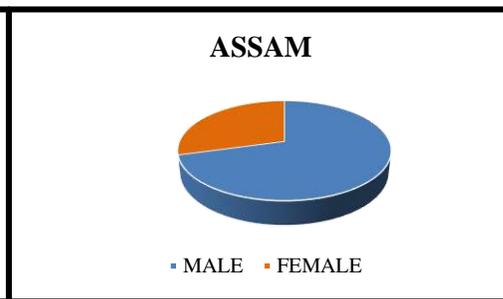
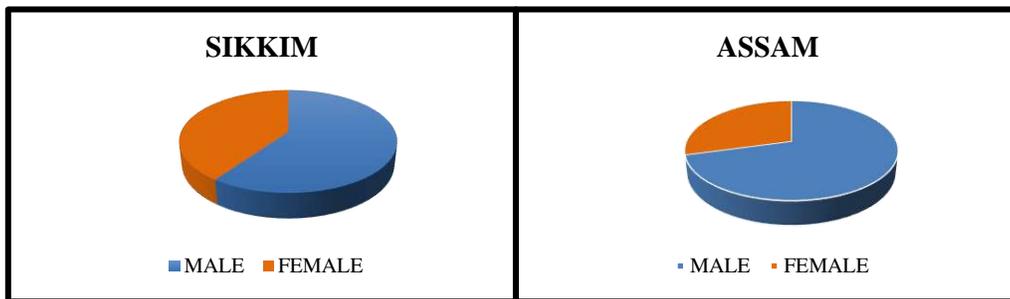
	2001
NAGALAND	MALE 40.7 FEMALE 38.1 PERSON 42.6



3. Do all 8 pie graph as per the 8 states data



PIE DIAGRAM SHOWING POPULATION COMPOSITION OF NORTHERN STATE OF INDIA (2001)

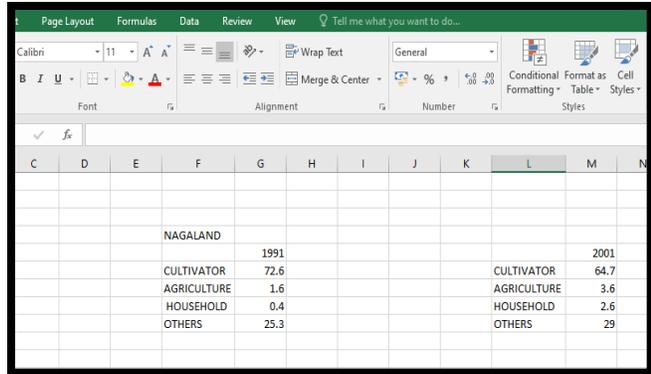


OCCUPATIONAL STRUCTURE:

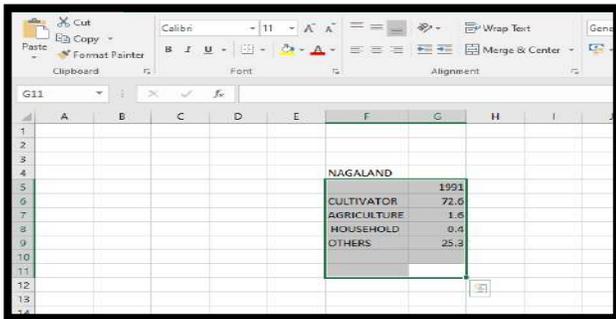
This refers to the aggregate distribution of occupations in society, classified according to skill level, economic function, or social status. The occupational structure is shaped by various factors: the structure of the economy (the relative weight of different industries); technology and bureaucracy (the distribution of technological skills and administrative responsibility); the labour-market (which determines the pay and conditions attached to occupations); and by status and prestige (influenced by occupational closure, life-style, and social values). It is difficult to attach causal primacy to any one of these factors; moreover, their role in shaping the occupational structure changes over time, as society changes. For example, during the early phase of European industrialization, the dominance of manufacturing made for a preponderance of manual occupations, while in recent times the shrinking of this sector, together with the growth in services, has made for an expansion of white-collar occupations. The distinction between manual and non-manual occupations has also become blurred. The occupational structure is described and analysed by means of various classificatory schemes, which group similar occupations together according to specific criteria such as skill, employment status, or function. Such classifications are also used as a basis for the empirical analysis of economic and social class. See also INDUSTRIAL SECTOR; OCCUPATIONAL CLASSIFICATION.

STATES	CULTIVATORS		AGRICULTURAL LABOURERS		HOUSEHOLD INDUSTRY WORKERS		OTHER WORKERS	
	2001	1991	2001	1991	2001	1991	2001	1991
ARUNACHALPRADESH	57.8	60.8	3.9	5.4	1.3	0.2	37.0	33.7
ASSAM	39.1	54.8	13.2	12.6	3.6	1.0	44.0	31.7
MANIPUR	40.2	59.9	12.0	10.3	10.3	6.0	37.6	23.8
MEGHALAYA	48.1	56.3	17.7	13.0	2.2	0.4	32.0	30.3
MIZORAM	54.9	62.3	5.7	5.4	1.5	1.1	37.9	31.2
NAGALAND	64.7	72.6	3.6	1.6	2.6	0.4	29.0	25.3
TRIPURA	27.0	39.0	23.8	24.2	3.0	1.6	46.1	35.2
SIKKIM	49.9	58.0	6.5	8.2	1.6	0.8	42.0	33.1

1. Open the excel sheet. Then put the data in excel.



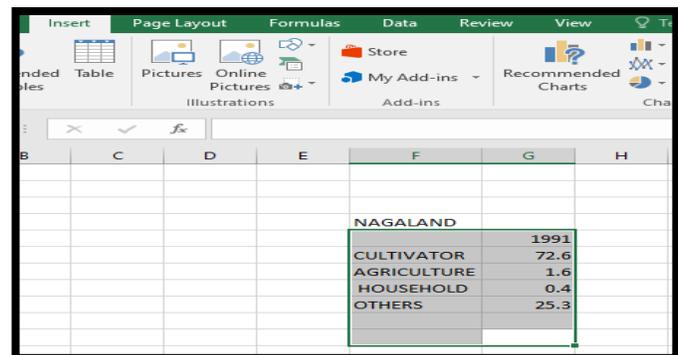
	1991	2001
NAGALAND		
CULTIVATOR	72.6	64.7
AGRICULTURE	1.6	3.6
HOUSEHOLD	0.4	2.6
OTHERS	25.3	29



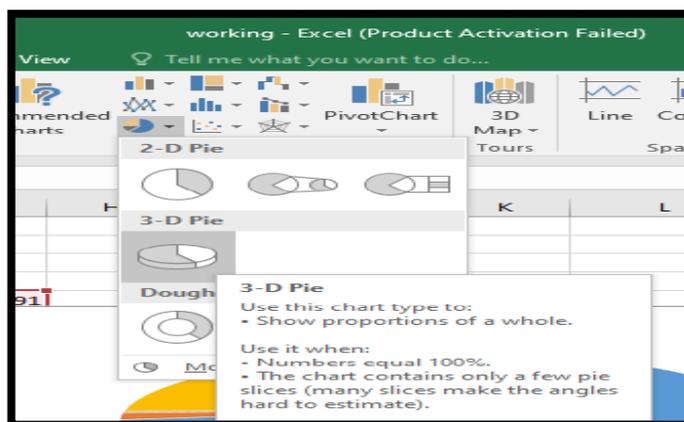
	1991	2001
NAGALAND		
CULTIVATOR	72.6	64.7
AGRICULTURE	1.6	3.6
HOUSEHOLD	0.4	2.6
OTHERS	25.3	29

2. Then select the data.

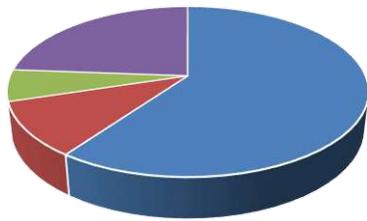
STEP 3: after select the data, then go to insert > then pie diagrams and finally showing the pie diagram.



	1991	2001
NAGALAND		
CULTIVATOR	72.6	64.7
AGRICULTURE	1.6	3.6
HOUSEHOLD	0.4	2.6
OTHERS	25.3	29

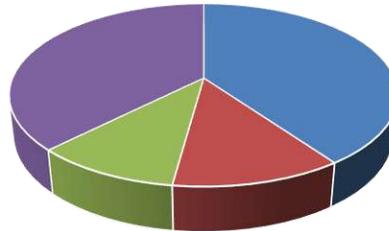


MANIPUR(1991)



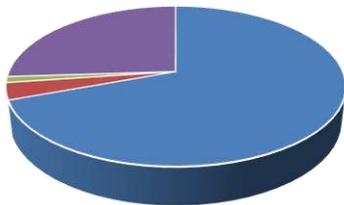
■ cultivator ■ agriculture ■ household ■ others

MANIPUR(2001)



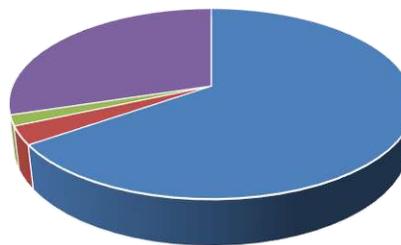
■ cultivator ■ agriculture ■ household ■ others

HIMACHAL PRADESH(1991)



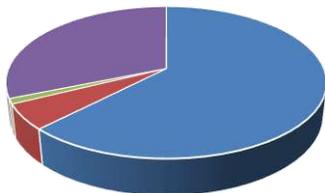
■ CULTIVTOR ■ AGRICULTURE
■ HOUSEHOLD ■ OTHERS

HIMACHAL PRADESH(2001)



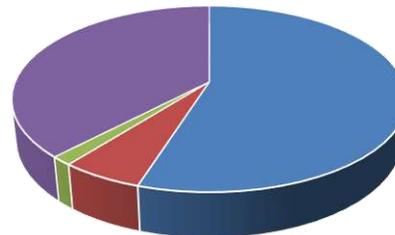
■ CULTIVATOR ■ AGRICULTURE ■ HOUSEHOLD ■ OTHERS

MIZORAM(1991)



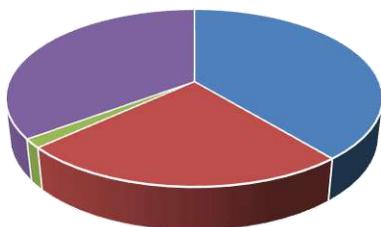
■ CULTIVATOR ■ AGRICULTURE
■ HOUSEHOLD ■ OTHERS

MIZORAM(2001)



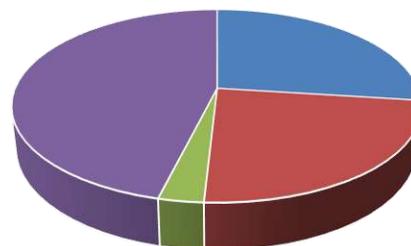
■ CULTIVATOR ■ AGRICULTURE ■ HOUSEHOLD ■ OTHERS

TRIPURA(1991)



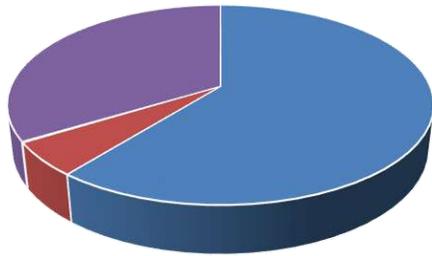
■ CULTIVATOR ■ AGRICULTURAL
■ HOUSEHOLD ■ OTHERS

TRIPURA(2001)



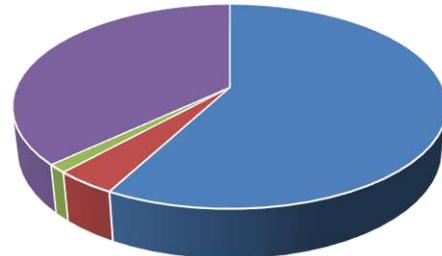
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ARUNACHALPRADESH(1991)



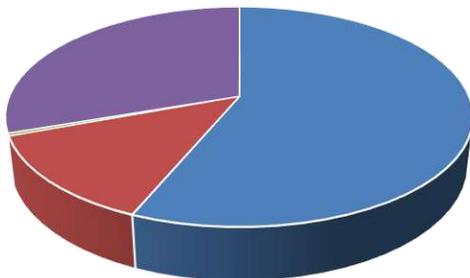
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ARUNACHALPRADESH(2001)



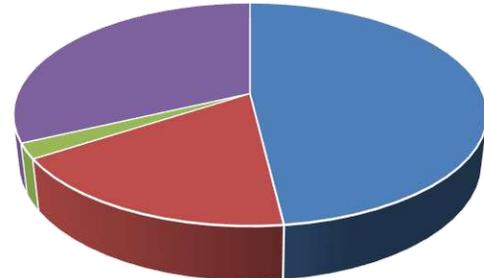
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

MEGHALAYA(1991)



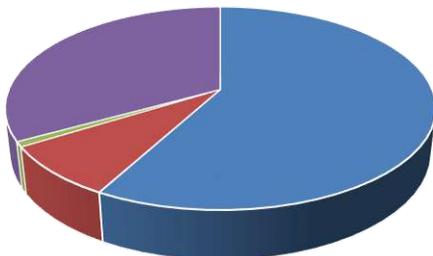
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

MEGHALYA(2001)



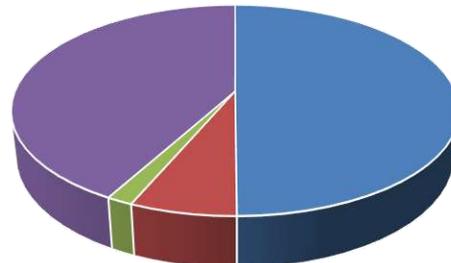
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

SIKKIM(1991)



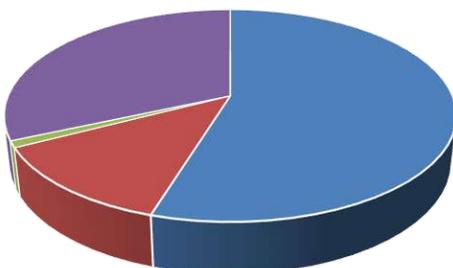
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

SIKKIM(2001)



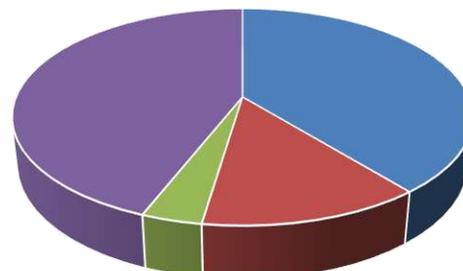
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ASSAM(1991)



■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ASSAM(2001)



■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

INTERPRETATION

The above pie diagrams show the occupational structure of the people of North Eastern States of India. The occupations have been classified into four categories- cultivator, agricultural, household and others.

The first pie diagrams show the occupational structure of Manipur in the year 1991 and 2001. In 1991 most of the people almost 60% are engaged in cultivator. But in the year 2001 it has decreased to 40.2%. In the year 2001, these 20 % people have changed their occupation to other economic activities. But in Himachal Pradesh % of people engaged in different types of economic activities are almost same for both the years 1991 and 2001.

From the above diagrams we can interpret that people from north east India mostly engaged in cultivators. Very few people engaged in agricultural and household activities.

DEPENDENCY RATIO:

The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0-14 and 65+) and those typically in the labour force (the productive part ages 15-64). It is used to measure the pressure on the productive population.

FORMULAE:

In published international statistics, the dependent part usually includes those under the age 15 and over the age of 64. The productive part makes up the population in the between ages 15-64. It is normally expressed as a percentage:

$$(Total) Dependency ratio: \frac{(no. of people aged 0-14) + (no. of people aged 65 and over) * 100}{no. of people aged 15-64}$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent. This results in direct impacts on financial expenditures on things like social security, as well as many indirect consequences.

The (total) dependency ratio can be decomposed into the child dependency ratio and the aged dependency ratio.

$$Child\ dependency\ ratio = \frac{no. of people aged 0-14}{no. of people aged 15-64} * 100$$

$$Aged\ dependency\ ratio = \frac{no. of people aged 65 and over}{no. of people 15-64} * 100$$

TABLE SHOWING % OF AGED AND CHILD DEPENDENT POPULATION

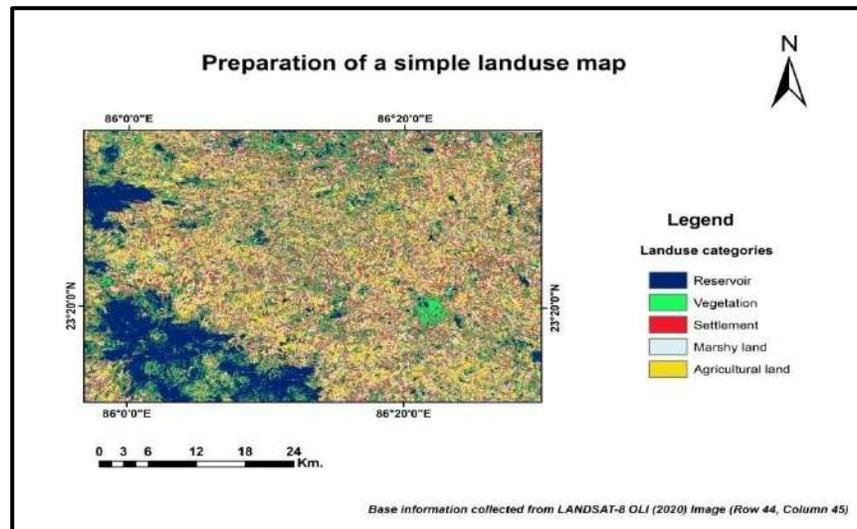
Age Group	Male	Female	Total		
00-04	37,43,862	35,89,281	7333143		
05-09	42,16,763	40,31,046	8247809	24737475	
10-14	46,77,506	44,79,017	9156523		
15-19	47,02,325	43,55,706	9058031		40.26986
20-24	44,22,630	43,35,692	8758322		
25-29	40,44,904	39,53,005	7997909		
30-34	34,64,659	33,76,931	6841590		
35-39	35,23,361	34,89,285	7012646	61429261	
40-44	32,19,604	29,33,456	6153060		
45-49	28,14,212	25,21,507	5335719		
50-54	23,17,232	19,40,648	4257880		47.69168
55-59	17,46,903	15,21,747	3268650		
60-64	14,06,401	13,39,053	2745454		
65-69	9,91,280	9,91,713	1982993		
70-74	6,86,881	7,03,726	1390607		7.421821
75-79	3,60,216	3,79,551	739767	4559170	
80+	4,06,536	4,77,025	445803		
Total	4,67,45,275	4,44,18,389	90725906		

CALCULATION HAS BEEN DONE WITH THE HELP OF THE FORMULAES i.e. was mentioned above.

APPLICATION OF GIS & RS

PREPARATION OF LAND USE MAP USING OPEN SOFTWARE:

Land Use maps of an area provide information to help users to understand the current landscape. The map, that reflects the land resources and types of land use in the national economy. Land use maps are subdivided into land resource, land in service, and agricultural land use maps.

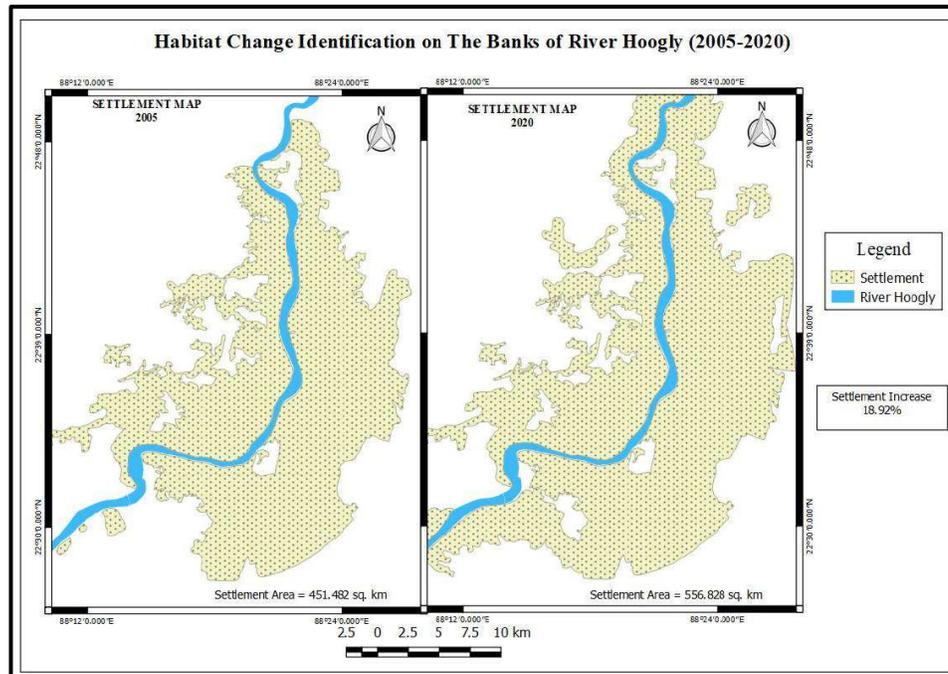


INTERPRETATION:

Here we have prepared a land use map of Purulia District. A major part of the area is covered by agricultural land (34.44971 sq. km). In this land use map 4.3496 sq. km, 15.3275 sq. km, 20.9375 sq. km, and 24.9356 sq. km area are covered by settlement, reservoir, vegetation and marshy land respectively.

MAPPING OF HUMAN HABITATION & DETECTION OF CHANGE:

As the human population grows, so does its footprint. To map these changes, researchers often turn to satellite imagery.



INTERPRETATION:

The above map displayed the habitat change on the banks of river Hooghly. Here we have taken 2 satellite maps (year of 2005 and 2020) of the bank of the Hooghly river. The map shows that, the settlement of the mentioned area has increases about 18.92%.

$$\% \text{ of Settlement change} = \left[\frac{\text{Area of 2020} - \text{Area of 2005}}{\text{Area of 2005}} \right] * 100$$

SPATIAL PLAN FORMULATION & LAYOUT FOR A VILLAGE

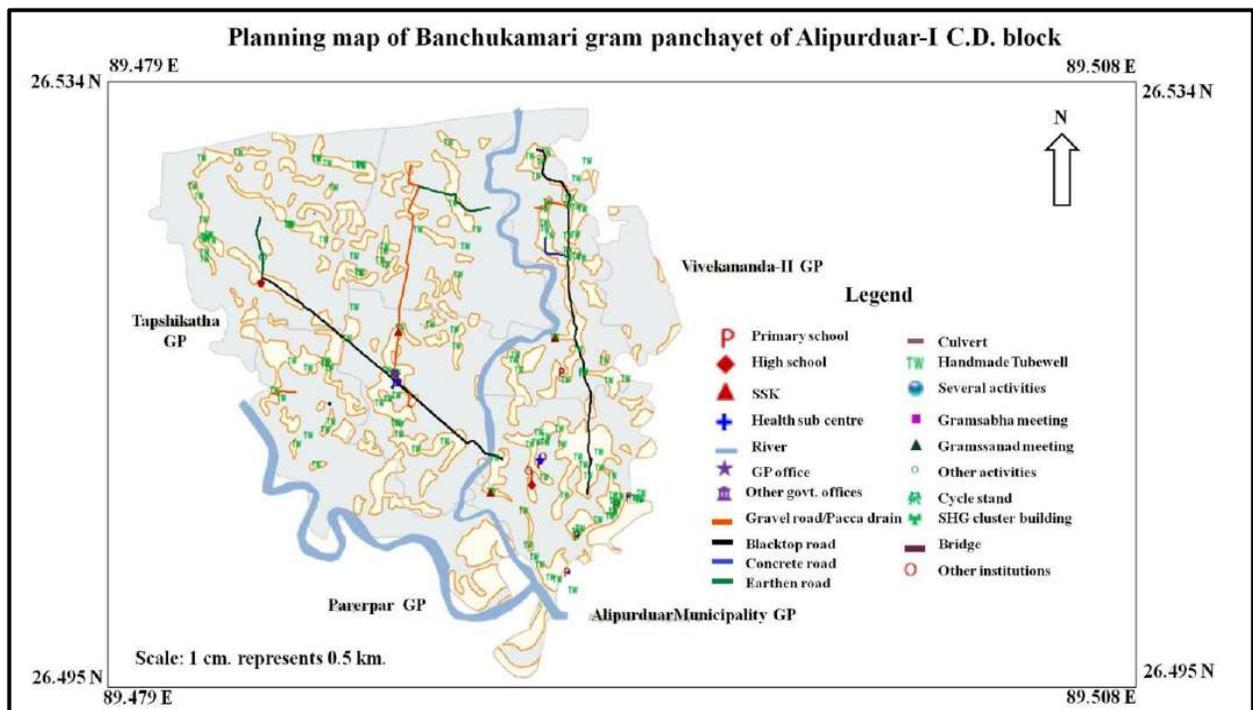
LEVEL PLANNING

Village maps are effective tools that help in understanding the geography of a village settlement. It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.

Village maps are effective tools that help in understanding the geography of a village settlement. It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.

Key Benefits:

- Conducts social mapping to illustrate the layout of houses, streets, hamlets and infrastructure in the village
- Identifies the most ideal locations to open schools
- Helps in making assessment regarding the status of the village, infrastructure facilities and employment opportunities
- Identifies the infrastructural and other development needs of the village
- It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.
- It also helps in determining the road networks i.e. the national highways, state highways with major rivers and forest around the particular village



PRACTICAL

Note Book

Regional Planning & Rural Development

Sayani Sadhukhan

Roll: BGC/MGF/SIV/21 NO-313

Reg. - 2014039120

GEOPDSE04P

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RESEARCH METHODS AND METHODOLOGY

MEANING OF RESEARCH

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge."¹ Redman and Mory define research as a "systematized effort to gain new knowledge."² Some people consider research as a movement, a movement from the known to the unknown. It is actually a voyage of discovery.

OBJECTIVES OF RESEARCH

- The purpose of research is to discover answers to questions through the application of scientific procedures.
- The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.
- Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:
- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies)
- To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies)
- To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies)
- To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

TYPES OF RESEARCH

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

There are a variety of approaches to research in any field of investigation, irrespective of whether it is applied research or basic research. Each particular research study will be unique in some ways because of the particular time, setting, environment, and place in which it is being undertaken.

Nevertheless, all research endeavours share a common goal of furthering our understanding of the problem and thus all traverse through certain basic stages, forming a process called the **research process**.

These 8 stages in the research process are;

1. Identifying the problem.
2. Reviewing literature.
3. Setting research questions, objectives, and hypotheses.
4. Choosing the study design.
5. Deciding on the sample design.
6. Collecting data.
7. Processing and analyzing data.
8. Writing the report.

Step – 1: Identifying the Problem

The first and foremost task in the entire process of scientific research is to identify a research problem.

A well-identified problem will lead the researcher to accomplish all-important phases of the research process, starting from setting objectives to the selection of the research methodology.

Step – 2: Reviewing literature

A literature review is a survey of scholarly sources on a specific topic. It provides an overview of current knowledge, allowing you to identify relevant theories, methods, and gaps in the existing research.

Identify literature gap:

After completed literature review researchers should find the gap, also considered the missing piece or pieces in the research literature, is the area that has not yet been explored or is under-explored. This could be a population or sample (size, type, location, etc.), research method, data collection and/or analysis, or other research variables or conditions.

- **RESEARCH PROBLEM**

A research problem is a specific issue, difficulty, contradiction, or gap in knowledge that you will aim to address in your research. You might look for practical problems aimed at contributing to change, or theoretical problems aimed at expanding knowledge.

Step- 3: Setting research questions, objectives, and hypotheses

After discovering and defining the research problem, researchers should make a formal statement of the problem leading to research objectives.

An **objective** will precisely say what should be researched, to delineate the type of information that should be collected, and provide a framework for the scope of the study. The best expression of a research objective is a well-formulated, testable research hypothesis.

A hypothesis is an unproven statement or proposition that can be refuted or supported by empirical data. Hypothetical statements assert a possible answer to a research question.

Step -4: Choosing the study design

The **research design** is the blueprint or framework for fulfilling objectives and answering research questions.

It is a master plan specifying the methods and procedures for collecting, processing, and analyzing the collected data. There are four basic research designs that a researcher can use to conduct his or her study;

1. survey,
2. experiment,
3. secondary data study, and
4. observational study.

Step – 5: Deciding on the sample design

Sampling is an important and separate step in the research process. The basic idea of sampling is that it involves any procedure that uses a relatively small number of items or portions (called a sample) of a universe (called population) to conclude the whole population.

Step-6: Collecting data.

While deciding about the method of data collection to be used for the study, the researcher should keep in mind two types of data viz., primary and secondary. The primary data are those which are collected afresh and for the first time, and thus happen to be original in character. The secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process.

Step-7: Processing and Analyzing Data

The data, after collection, has to be processed and analysed in accordance with the outline laid down for the purpose at the time of developing the research plan. This is essential for a

scientific study and for ensuring that we have all relevant data for making contemplated comparisons and analysis.

Step-8: Writing the report

This is the final steps when researcher write a brief description of the research work, It involves above steps to present the report in the form of thesis or Dissertation.



Focus Group Discussion (FGD)

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.

- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

TECHNIQUES AND FORMULATION OF RURAL PLANNING THOUGHT DATA ANALYSIS

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts.

Strengths

Strengths describe what an organization excels at and what separates it from the competition: a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

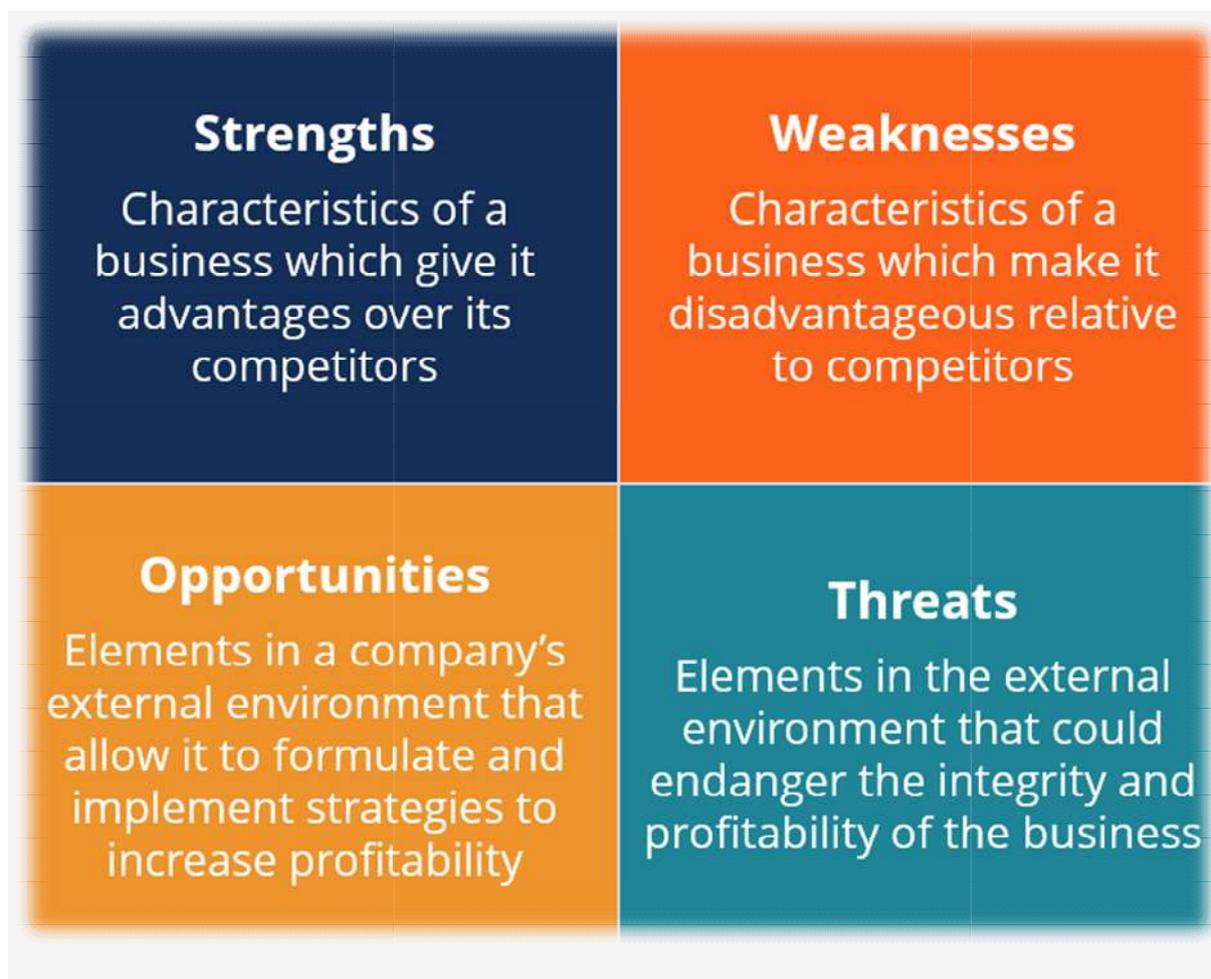
Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favourable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and market share.

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.



Population composition

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

The age structure

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way, people live their lives.

The sex ratio

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population.

In some countries, like U.S.A, the sex ratio is expressed in terms of number of males per thousand females and is calculated by using the formula:

$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of males per thousand females.

In India, the sex ratio is calculated in terms of number of females per thousand males. It is calculated as under

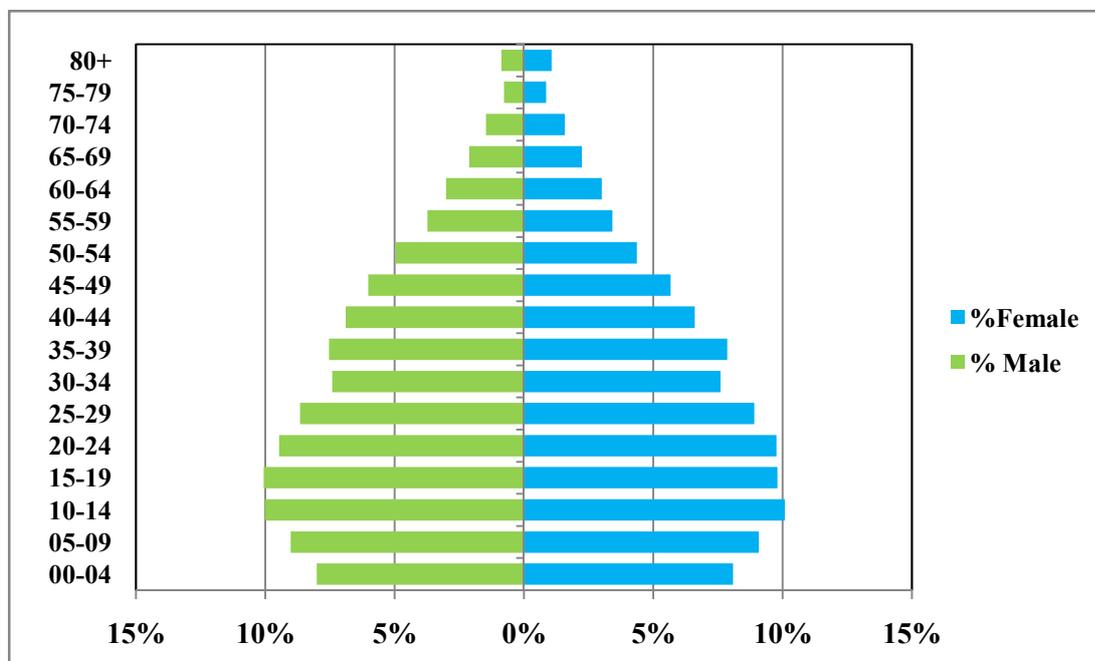
$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of females per thousand males.

Population pyramid

Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

Age-Sex Pyramid



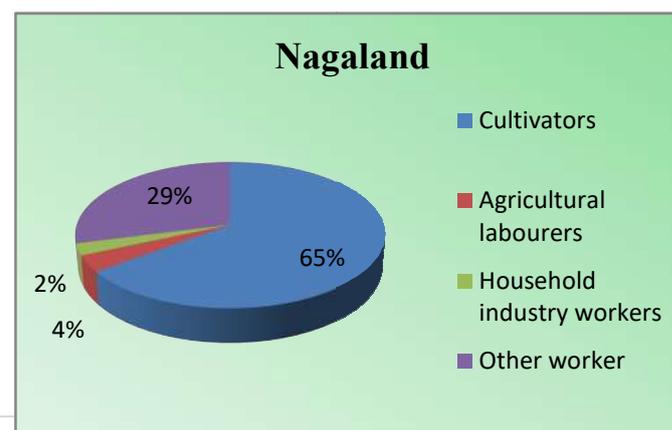
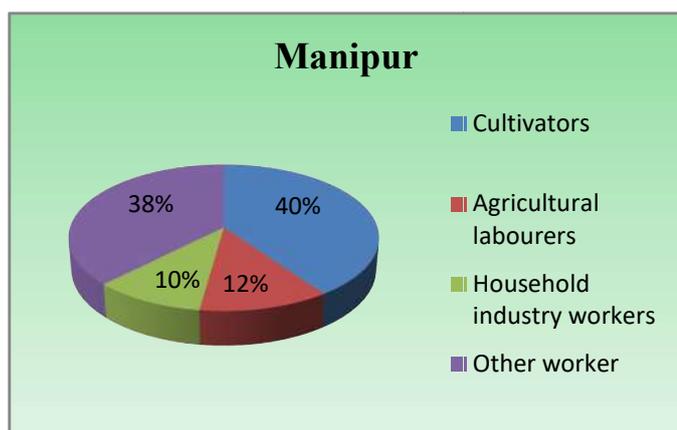
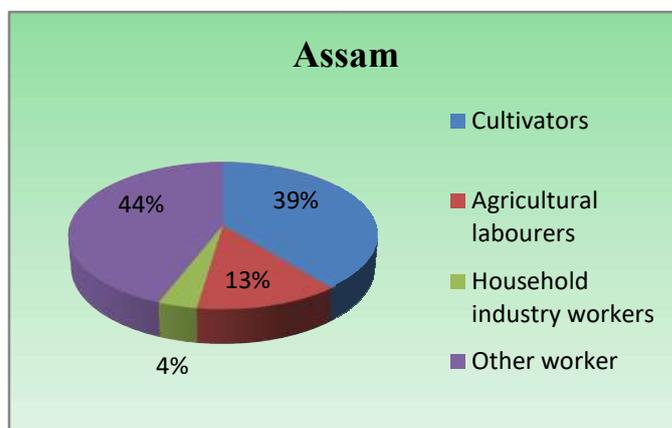
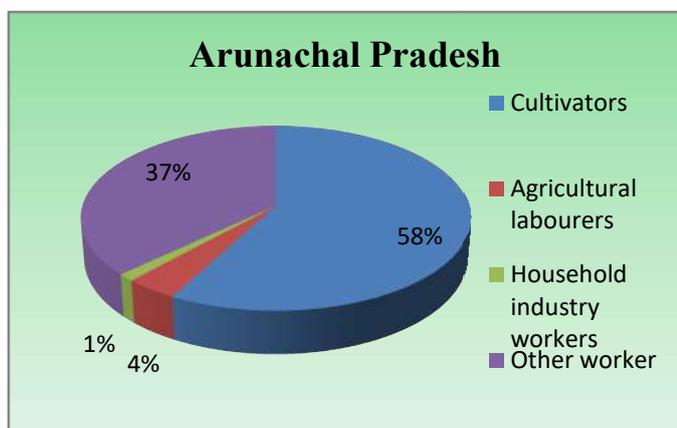
- In this pyramid the bottom heavy i.e. the population has a larger proportion of children, teenagers and young adults.
- The country's population for the age cohorts of 0-4, 5-9, 10-14 and 15-19 is roughly equal, whereas the numbers for older groups become progressively smaller.
- This means that the country's younger age groups have stopped growing in numbers now and are likely to shrink slightly soon.
- Except for the oldest groups, It have more males than females for every cohort.

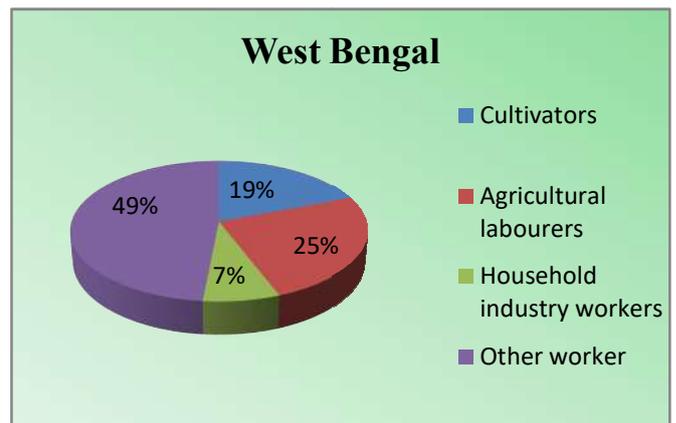
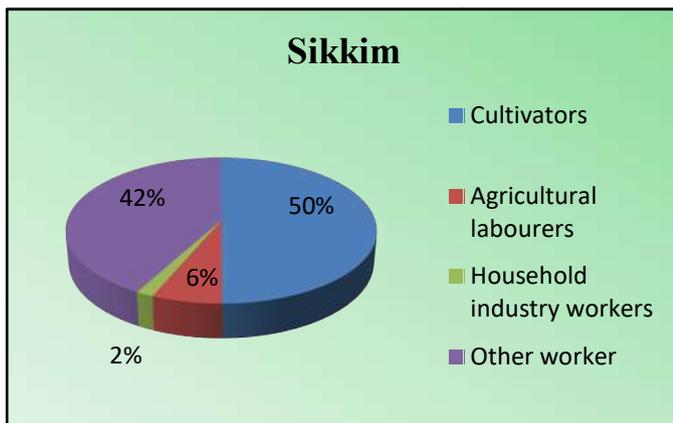
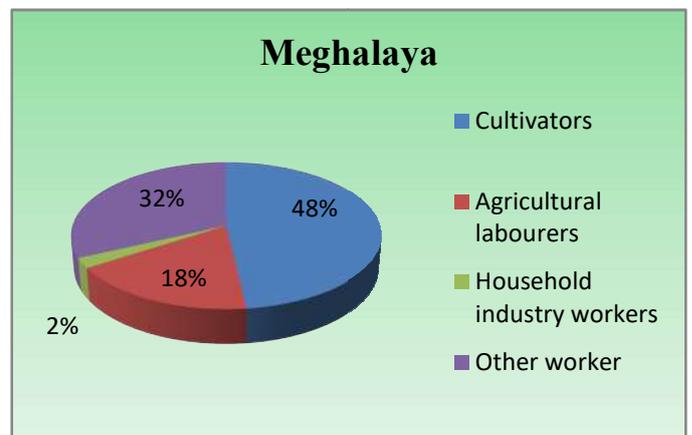
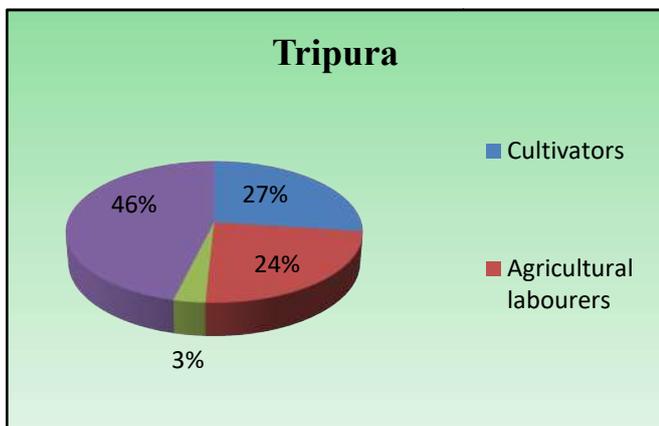
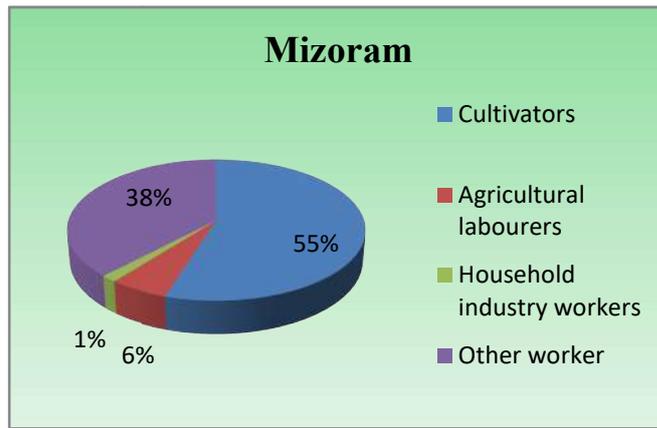
Occupational Structure

The working population takes place in various occupations ranging from agriculture, forestry, fishing, manufacturing, construction, commercial transport, services, communication and other unclassified services. Agriculture, forestry, fishing and mining are classified as primary activities, manufacturing as secondary, transport, communication and other services as tertiary and the jobs related to research and developing ideas as quaternary activities. The proportion of working population engaged in these four sectors is a good indicator of the levels of economic development of a nation. A developed economy with industries can accommodate more workers in the secondary, tertiary and quaternary sector. If the economy is in primitive stages, then the proportion of people engaged in primary activities would be high

STATES/UNION TERRITORY	CULTIVATORS	AGRICULTURAL LABOURERS	HOUSEHOLD INDUSTRY	OTHERS WORKERS
ASSAM	39.1	13.2	3.6	44
MEGHALAYA	48.1	17.7	2.2	32
MANIPUR	40.2	12	10.3	37.6
MIZORAM	54.9	5.7	1.5	37.9
NAGALAND	64.7	3.6	2.6	29
TRIPURA	27	23.8	3	46.1
ARUNACHAL PRADESH	57.8	3.9	1.3	37
SIKKIM	49.9	6.5	1.6	42
TOTAL	381.7	86.4	26.1	305.6

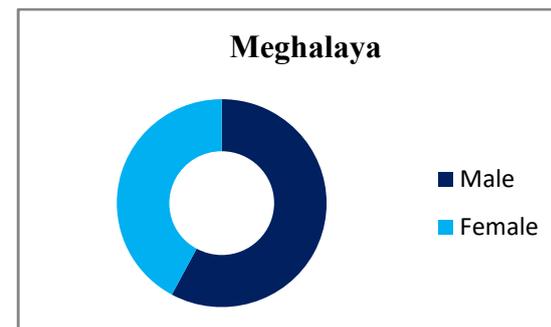
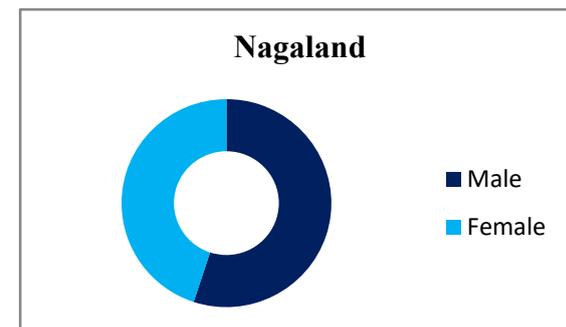
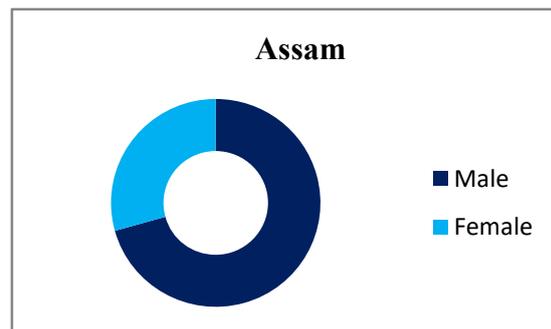
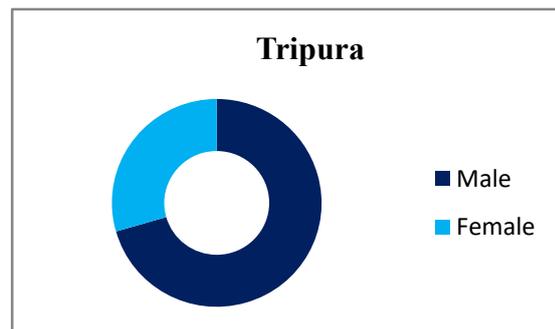
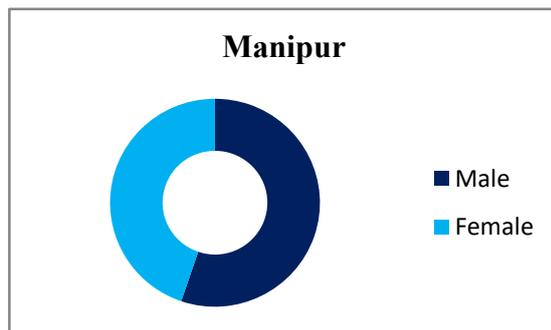
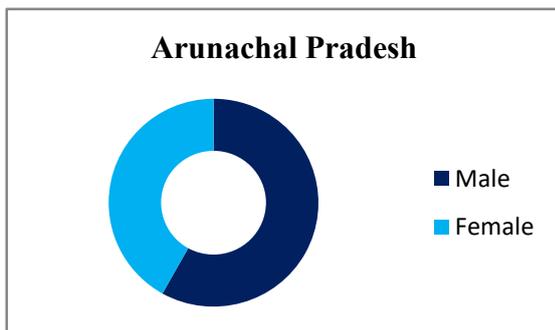
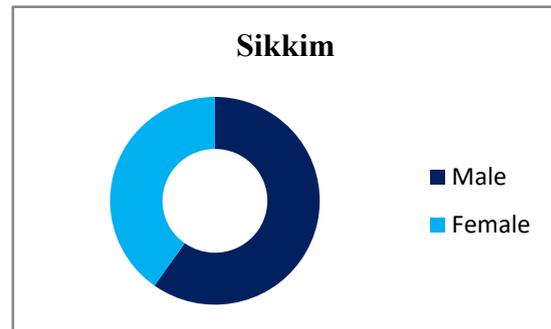
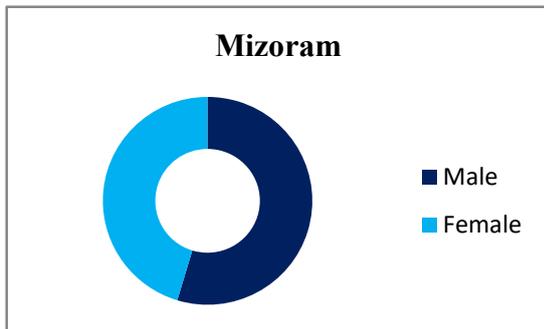
PIE Diagram Showing Distribution Of Workers By Category Of Workers





WORK PARTICIPATION RATE NORTH-EASTERN STATES OF INDIA (2001)

State	Male	Female
Mizoram	57.3	47.5
Sikkim	57.4	38.6
Arunachal Pradesh	50.6	36.5
Manipur	48.1	39
Nagaland	46.7	38.1
Meghalaya	48.3	35.1
Tripura	50.6	21.1
Assam	49.9	20.7



Dependency ratio

The dependency ratio is an agepopulation ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

Dependency ratio formula

$$\text{Dependency Ratio} = \frac{(\text{number of people aged 0 to 14}) + (\text{number of people aged 65 and over})}{\text{number of people aged 15 to 64}} \times 100$$

Migration

Human migration is the movement of people from one place in the world to another for the purpose of taking up permanent or semipermanent residence, usually across a political boundary. Migration People can either choose to move ("voluntary migration") or be forced to move ("involuntary migration"). Migration occurs at a variety of scales: intercontinental (between continents), intracontinental (between countries on a given continent), and interregional (within countries).

Migration One of the most significant migration patterns has been Rural to Urban migration—the movement of people from the countryside to cities in search of opportunities.

- **FACTORS OF MIGRATION**

Migration is a **global phenomenon** caused not only by economic factors but many other factors like **social, political, cultural, environmental, health, education** are included under the broader classification of **Push and Pull factors** of migration:

Push-factors Countries of origin	Migrants	Pull Countries
⇒ Population growth, young age structure	Demographic factors and social infrastructure	⇒ Stable population decline, de
⇒ Inadequate educational institutions, medicare and social security		⇒ Welfare educational medicare, s
⇒ Unemployment, low wages	Economic factors	⇒ Labour den
⇒ Poverty, low consumption and living standard		⇒ Welfare, l and living s
⇒ Dictatorships, shadow democracy, bad governance, political upheaval	Political factors	⇒ Democracy pluralism, p
⇒ Conflict, (civil) war, terrorism, human rights violation, oppression of minorities		⇒ Peace, secu human a protection e
⇒ Ecologic disaster, desertification, lack of natural resources, water shortage, soil	Ecological factors	⇒ Better environmen protection

Push Factor: Push factors are those that **compel** a person, due to different reasons, to leave a place of **origin** (out-migration) and migrate to some other place.

Pull Factor: Pull factors indicate the factors which **attract** migrant (in-migration) to an area (destination).

Types of migration

- **internal migration:** moving within a state, country, or continent
- **external migration:** moving to a different state, country, or continent
- **emigration:** leaving one country to move to another
- **immigration:** moving into a new country
- **return migration:** moving back to where you came from
- **seasonal migration:** moving with each season or in response to labour or climate conditions

VITAL STATISTICS METHOD OF MIGRATION:

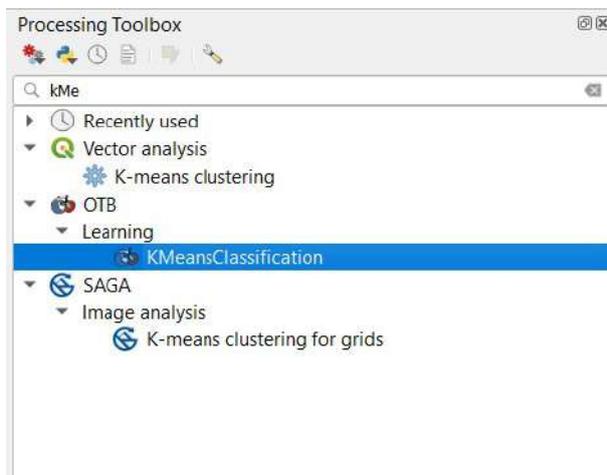
Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put in the following simple form:

$$\text{Net } M = (P_{+n}) - P_{-} - (B - D)$$

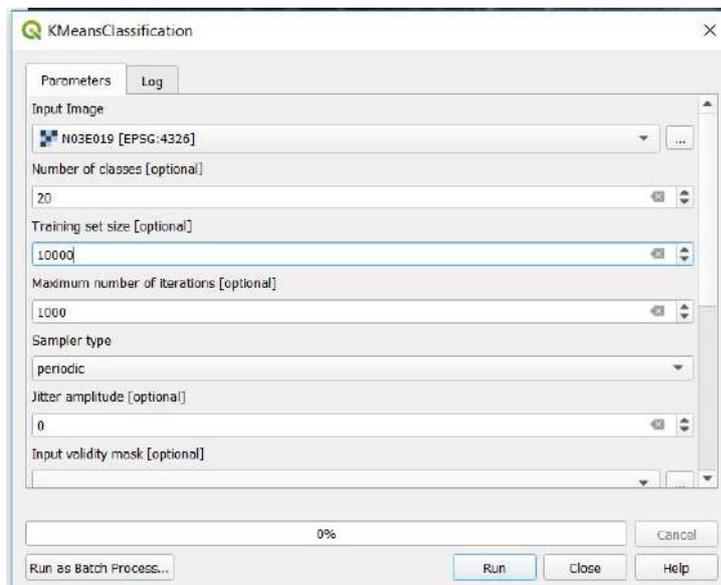
where for any given area Net M = net migration, P₋ is the population at the earlier census, P_{+n} is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to residents.

Land use map using Unsupervised classification

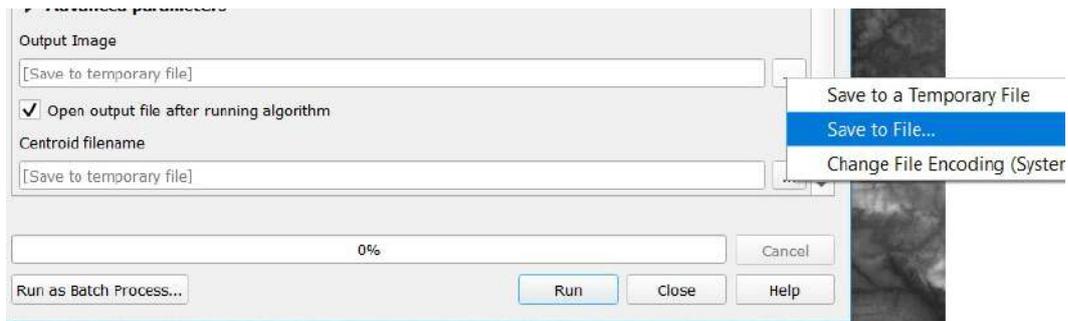
- Add a raster layer in a project **Layer >> Add Layer >> Add Raster Layer**.
- Go to the search box of Processing Toolbox , search **KMeans** and select the **KMeansClassification**.



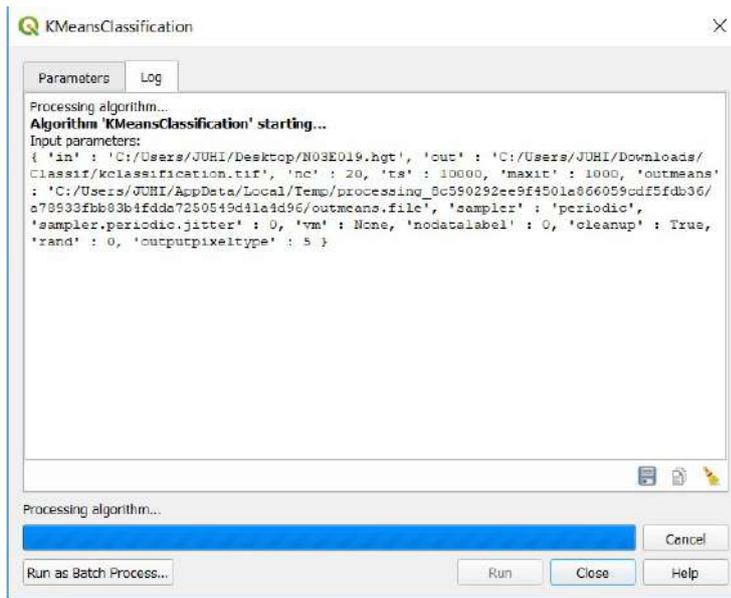
Select the input image. Type the Number of classes to 20 (default classes are 5)
Fill training size to 10000



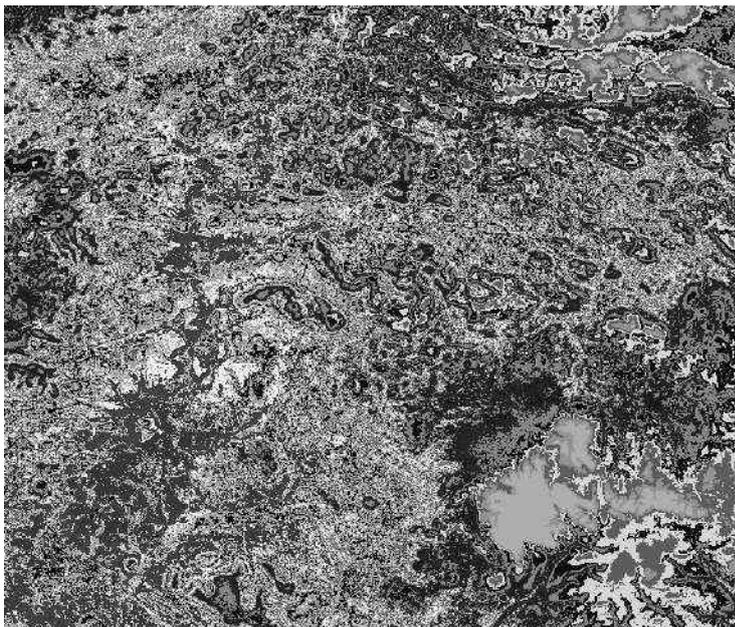
- Type the name of output image save to file.



- And in the last tap on **Run**



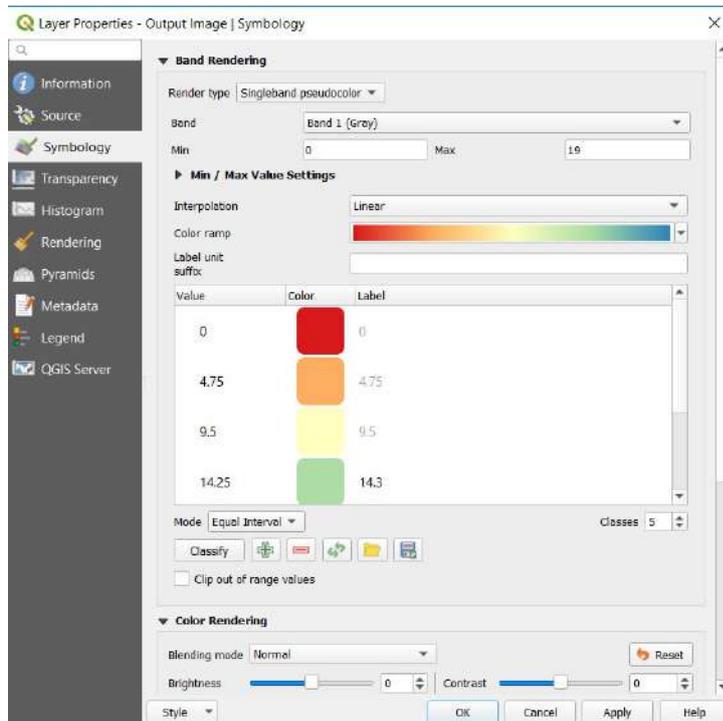
- Output image directly display on canvas. Image is shown below.



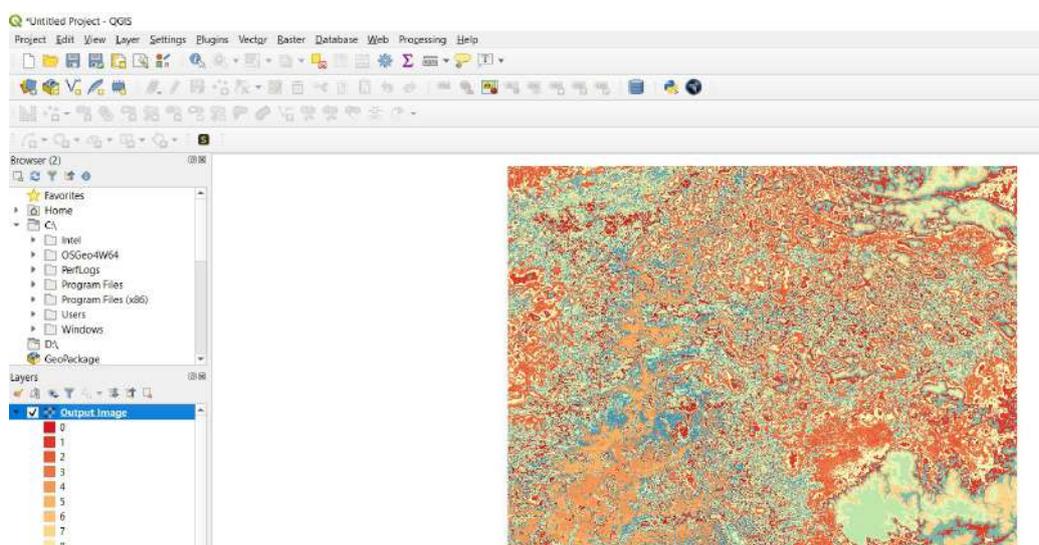
In the layer panel, right click on the output layer and select **Properties >> Symbology**. Change Render Type **SinglebandPseudocolor**.

- Select the **Color Ramp** (we selected spectral)
- Choose Mode **Equal Interval** (default selection is continous)

Change the number of **classes** from 5 to **20**.

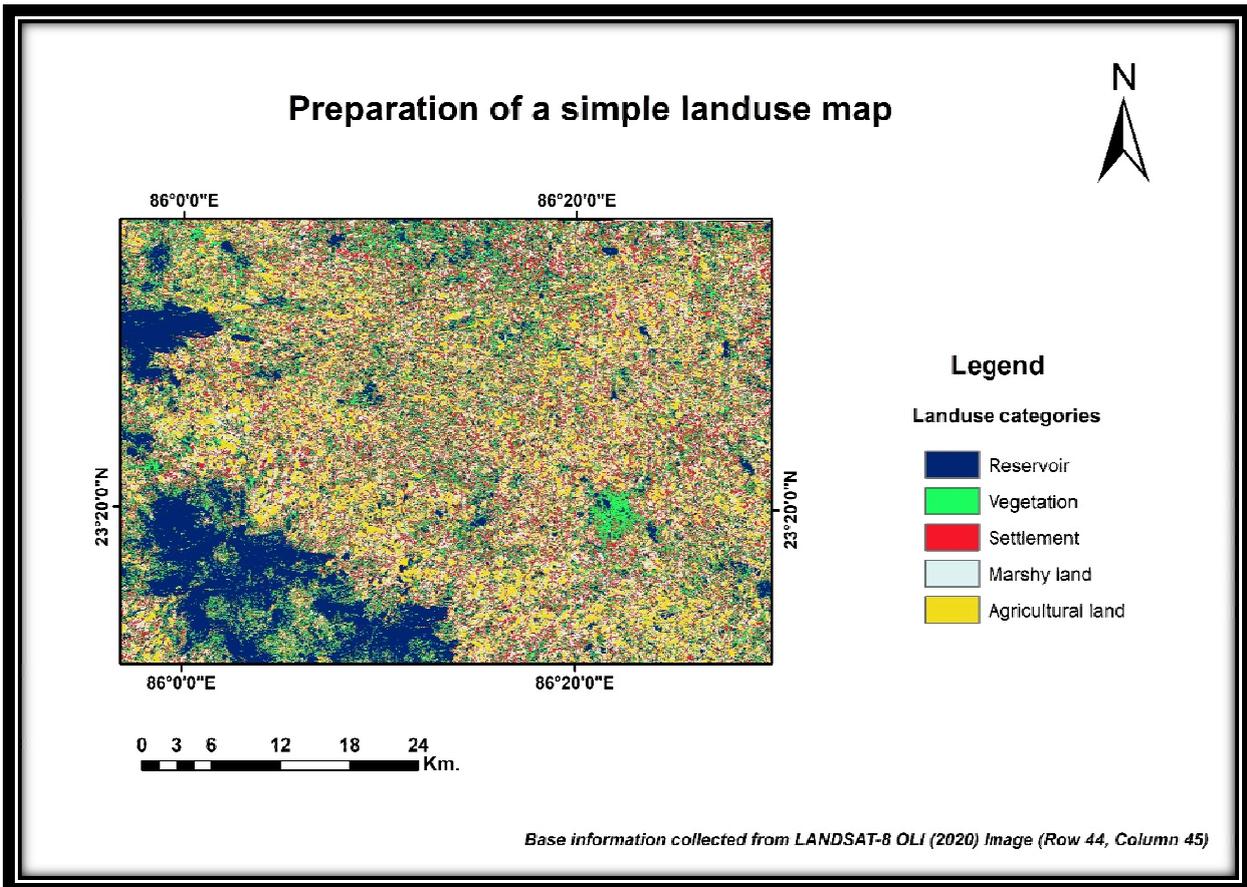


In the last click on **OK**. Output image is provided below. You can also classify according to discrete interpolation if desired



This is all about unsupervised classification using KMeansClassification. If you face any problem in implementing then please do comment.

Preparation of a simple landuse map



Interpretation:

The study area is Bankura District, is a region of West Bengal. This region have various of land use and cover features.

- **Land cover:** It is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground water etc. Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water.
- **Land use:** It not only shows how people use the landscape but also utilization of land resources naturally. Therefore, the land of a particular region can be used for the purpose of infrastructural development, settlements, amusement & recreation, conservation of wildlife and wildlife habitat, agriculture & farming or mixed uses and can be defined as 'land use'. Land use applications involve both baseline mapping and subsequent monitoring, since timely information is required to know what current quantity of land is in what type of use and to identify the land use changes from year to year.

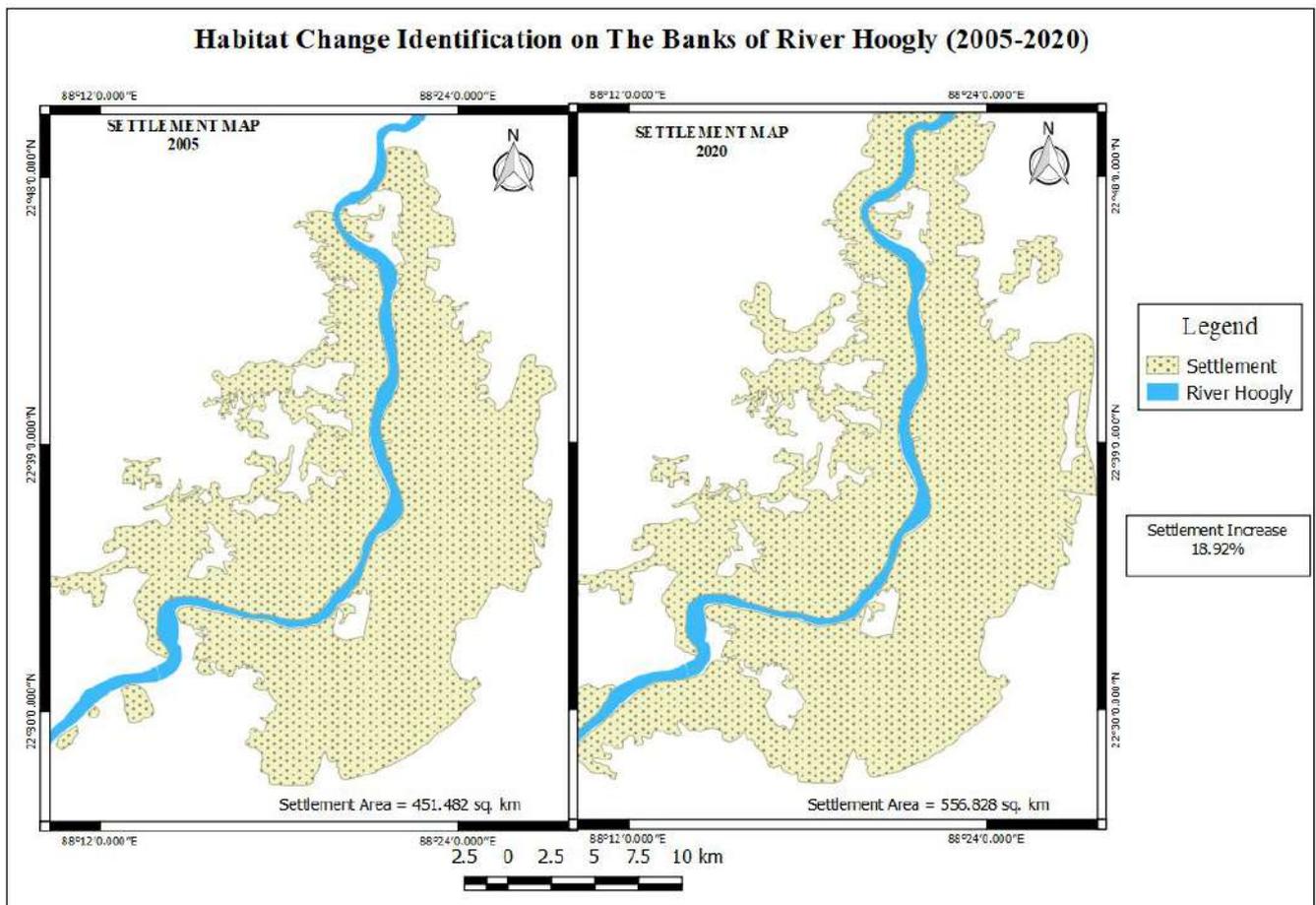
- **Vegetation:** Deciduous forest is mainly dominated by woody vegetation cover, i.e., >60% along with average plant height more than 2 metre. The floral communities dominated by the trees which hold broadleaves with an inimitable feature of annual cycle of leaf-on and leaf-off periods means the trees shed their leaves at a particular season of each year, mainly in late winter. Dense forest like Khatra, Ranibandh, Bishnupur, Sonamukhi, Bojora, Gangajal ghati occupies huge areas of the district, Bankura. Currently the land under forest department is approximately 21.5%. About 48% of the forest in this district is degraded type and alarmingly the forest/plant cover is depleting gradually. In addition to ecological utilities, the forests in this district also serve as the basis of livelihood of poor communities of the rural area and the tribes as well. Forests not only provide money but also are important for energy resources in form of fuel and forage for the disadvantaged folks. This type of forest mainly located West, East and South part of the district.

- **Cropland:** Temporarily cropped area followed by harvest and a bare soil period (e.g., single and multiple cropping systems). Different types of crop cultivation and cropping arrangement are specified according to the seasons (e.g., kharif, rabi, zaid). Cropland includes areas are used for the common crop production and are also used for the adapted crops for harvest. Agriculture in Bankura district is dominated by paddy cultivation in kharif season and mustard cultivation in rabi season. A large number of landraces of rice were cultivated by the tribal and rural community of farmers of Bankura district, so far 65 folk rice varieties are produced from Bankura District of West Bengal viz., Dharnagra, Suakalma, Vutmuri, Tulsibhog, Sitasal, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, Badsahabhog, Raghusal, Bhurisal, Khajurchari, Gangajali, Basmati and Kataribhog. Other crops are paddy, wheat, sugarcane, oilseeds etc.,

- **Water Body:** Bankura is drained by three major rivers e.g., Damodar, Darkeswar and Kangsabati along with their tributaries as Gandheswari, Silai and Kumari deserves special consideration. The rivers of the area are flowing from the north-east to the south-west in courses roughly parallel to one another. They are mostly rain-fed, hill streams, originating from hills in the west. The rivers come down in floods after heavy rains and subside as rapidly as they rise. In summer, their sand beds are almost always dry. Damodar river forms the northern boundary of the district along with Bardhaman district for about 72 kilometres and then flows into Bardhaman district. Saliriver which is one of the important tributaries of the Damodar, drains the northern part of the district.

- **Settlement:** Settlement is one of the major land use features. In the study area here almost every place has settlement. Mainly centre to east part of the district are dense population.
- **Upland:** Here I also noticed that the south, middle and west part of the district have some of uplands. Maximum river are generated from this area.

Human Habitation and Detection of Change from Two Satellite Image of (2005- 2020)



Interpretation:

Here we can see some changes of settlement on both sides of river Hooghly. According to our calculation settlement increases around 19% from 2005 to 2020. Mainly south part of map settlement increase massively. Where in 2005 the settlement area was only 451.48 sq.km. on 10km buffer of the river it increases in 2020 in 556.83 sq.km.. West part of the river is maximum settlement increase then the left part.

Spatial Plan Formulation and Layout Map of a Gram Panchayat

Step 1-Collect Mouza map from following Gram Panchyat.

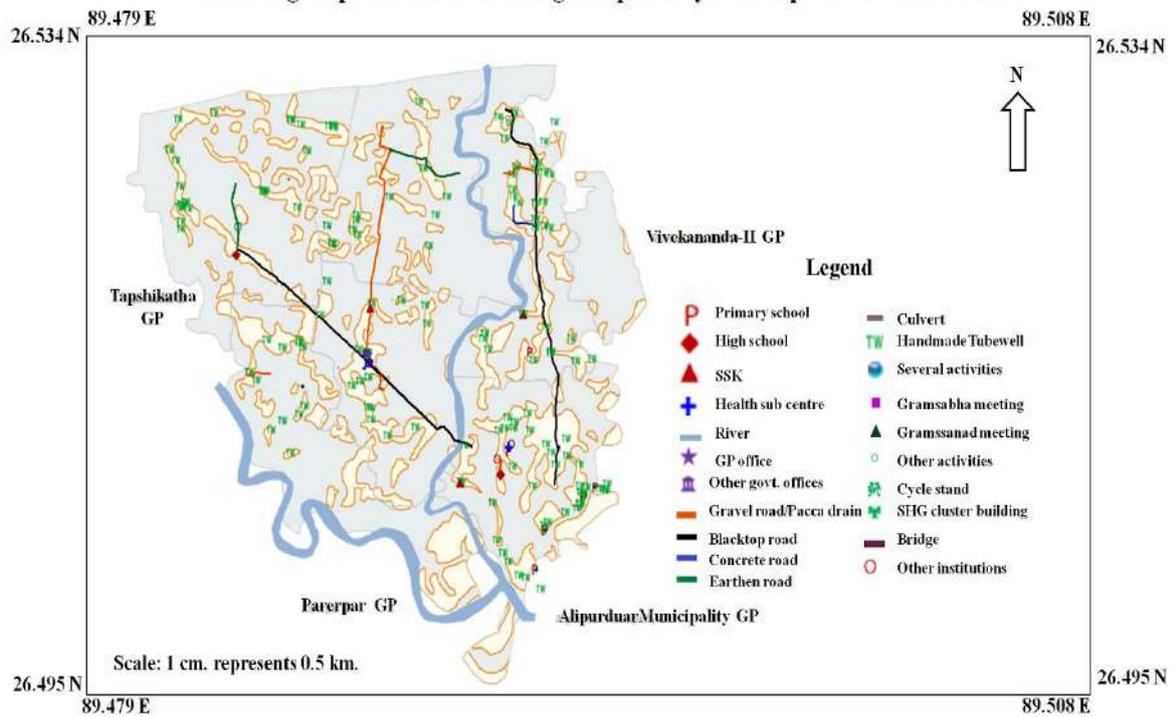
Step 2. Then using QGIS Georeference the the Mouza Map and clip the particular the village Boundary.

Step 3. Using GPS survey I collect every impotent place of the village like school, police station, any administrative building etc. it find from gram panchyat by secondary data.

Step4. Plot the places as a point and digitized settlements also Roads using Qgis.

Step 5. At the end prepare a layout map and add legends, north lines, scale and heading of the map.

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation:

Banchukamari is a Village in Alipurduar-i Block in Jalpaiguri District of West Bengal State, India. It belongs to Jalpaiguri Division . It is located 89 KM towards East from District head quarters Jalpaiguri. 4 KM from Alipurduar-I. 530 KM from State capital Kolkata. In this village planning map I put every impotent features. Here we see in village have 2 river one is run west boundary of the village and another is running centre part of the village. I noticed right sight of Centre River have maximum primary school then other side of the river. Also noticed here 2 high school one is west part of village and another is south east part of the village. Handmade tube well is available everywhere in the village. But here only 2 hospital or health centre located in the village. Centre of the village have Gram panchyat and govt. Offices. Here also noticed 2 SSK and one other institution.

2021

PRACTICAL Note Book

REGIONAL PLANNING & RURAL
DEVELOPMENT

 KINGSHUK MAITY

ROLL –BGC/MGM/SIV/21 NO-314

REG. NO.- 2014039009

GEOPDSE04P

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RESEARCH METHODS AND METHODOLOGY

MEANING OF RESEARCH

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge."¹ Redman and Mory define research as a "systematized effort to gain new knowledge."² Some people consider research as a movement, a movement from the known to the unknown. It is actually a voyage of discovery.

OBJECTIVES OF RESEARCH

- The purpose of research is to discover answers to questions through the application of scientific procedures.
- The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.
- Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:
- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies)
- To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies)
- To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies)
- To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

TYPES OF RESEARCH

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

There are a variety of approaches to research in any field of investigation, irrespective of whether it is applied research or basic research. Each particular research study will be unique in some ways because of the particular time, setting, environment, and place in which it is being undertaken.

Nevertheless, all research endeavours share a common goal of furthering our understanding of the problem and thus all traverse through certain basic stages, forming a process called the **research process**.

These 8 stages in the research process are;

1. Identifying the problem.
2. Reviewing literature.
3. Setting research questions, objectives, and hypotheses.
4. Choosing the study design.
5. Deciding on the sample design.
6. Collecting data.
7. Processing and analyzing data.
8. Writing the report.

Step – 1: Identifying the Problem

The first and foremost task in the entire process of scientific research is to identify a research problem.

A well-identified problem will lead the researcher to accomplish all-important phases of the research process, starting from setting objectives to the selection of the research methodology.

Step – 2: Reviewing literature

A literature review is a survey of scholarly sources on a specific topic. It provides an overview of current knowledge, allowing you to identify relevant theories, methods, and gaps in the existing research.

Identify literature gap:

After completed literature review researchers should find the gap, also considered the missing piece or pieces in the research literature, is the area that has not yet been explored or is under-explored. This could be a population or sample (size, type, location, etc.), research method, data collection and/or analysis, or other research variables or conditions.

- **RESEARCH PROBLEM**

A research problem is a specific issue, difficulty, contradiction, or gap in knowledge that you will aim to address in your research. You might look for practical problems aimed at contributing to change, or theoretical problems aimed at expanding knowledge.

Step- 3: Setting research questions, objectives, and hypotheses

After discovering and defining the research problem, researchers should make a formal statement of the problem leading to research objectives.

An **objective** will precisely say what should be researched, to delineate the type of information that should be collected, and provide a framework for the scope of the study. The best expression of a research objective is a well-formulated, testable research hypothesis.

A hypothesis is an unproven statement or proposition that can be refuted or supported by empirical data. Hypothetical statements assert a possible answer to a research question.

Step -4: Choosing the study design

The **research design** is the blueprint or framework for fulfilling objectives and answering research questions.

It is a master plan specifying the methods and procedures for collecting, processing, and analyzing the collected data. There are four basic research designs that a researcher can use to conduct his or her study;

1. survey,
2. experiment,
3. secondary data study, and
4. observational study.

Step – 5: Deciding on the sample design

Sampling is an important and separate step in the research process. The basic idea of sampling is that it involves any procedure that uses a relatively small number of items or portions (called a sample) of a universe (called population) to conclude the whole population.

Step-6: Collecting data.

While deciding about the method of data collection to be used for the study, the researcher should keep in mind two types of data viz., primary and secondary. The primary data are those which are collected afresh and for the first time, and thus happen to be original in character. The secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process.

Step-7: Processing and Analyzing Data

The data, after collection, has to be processed and analysed in accordance with the outline laid down for the purpose at the time of developing the research plan. This is essential for a

scientific study and for ensuring that we have all relevant data for making contemplated comparisons and analysis.

Step-8: Writing the report

This is the final steps when researcher write a brief description of the research work, It involves above steps to present the report in the form of thesis or Dissertation.



Focus Group Discussion (FGD)

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.

- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

TECHNIQUES AND FORMULATION OF RURAL PLANNING THOUGHT DATA ANALYSIS

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts.

Strengths

Strengths describe what an organization excels at and what separates it from the competition: a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

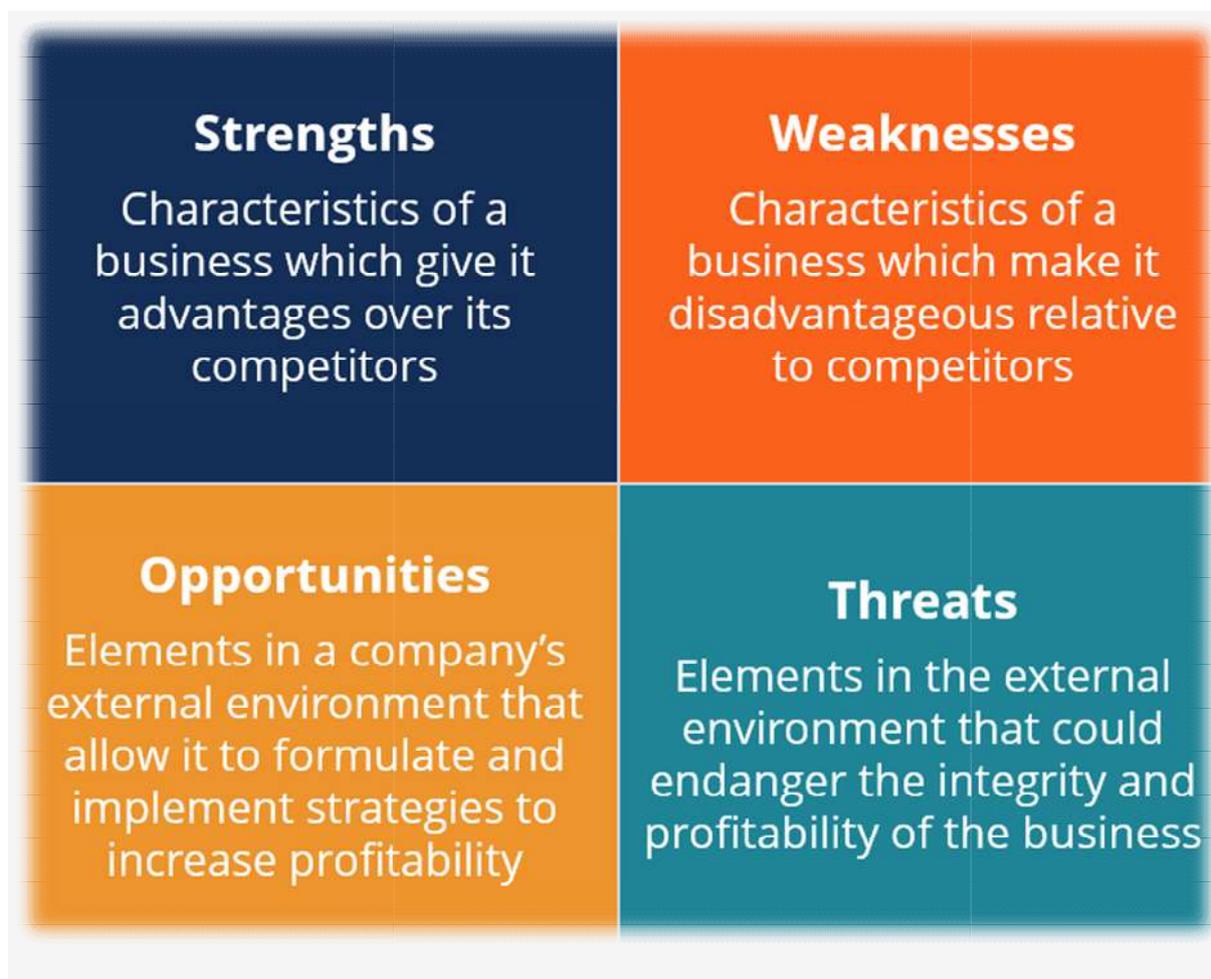
Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favourable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and market share.

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.



Population composition

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

The age structure

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way, people live their lives.

The sex ratio

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population.

In some countries, like U.S.A, the sex ratio is expressed in terms of number of males per thousand females and is calculated by using the formula:

$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of males per thousand females.

In India, the sex ratio is calculated in terms of number of females per thousand males. It is calculated as under

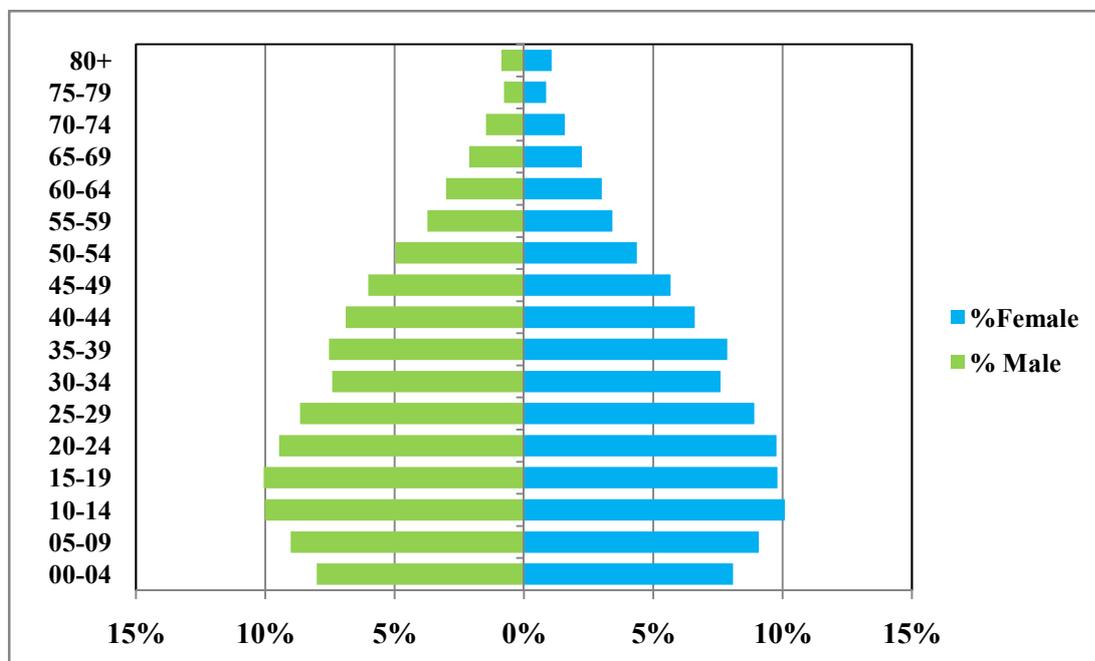
$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of females per thousand males.

Population pyramid

Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

Age-Sex Pyramid



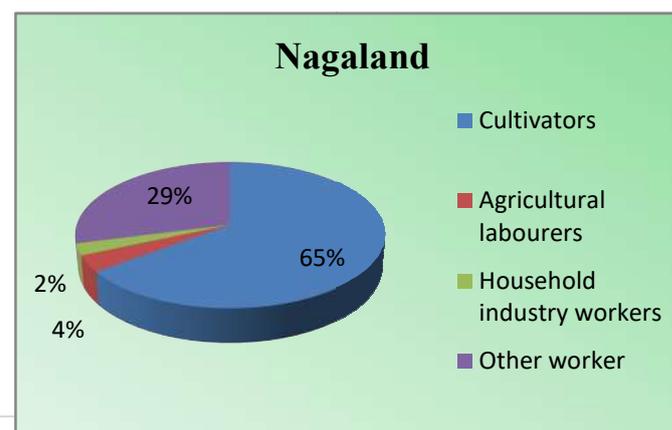
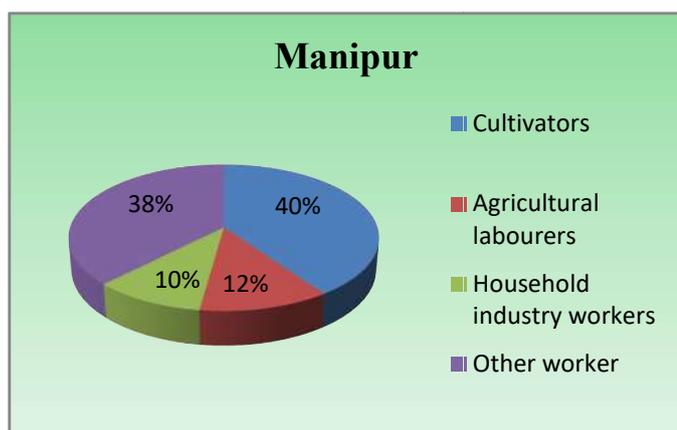
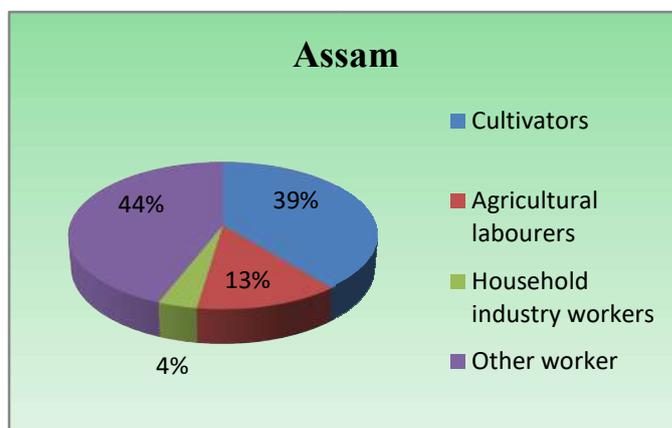
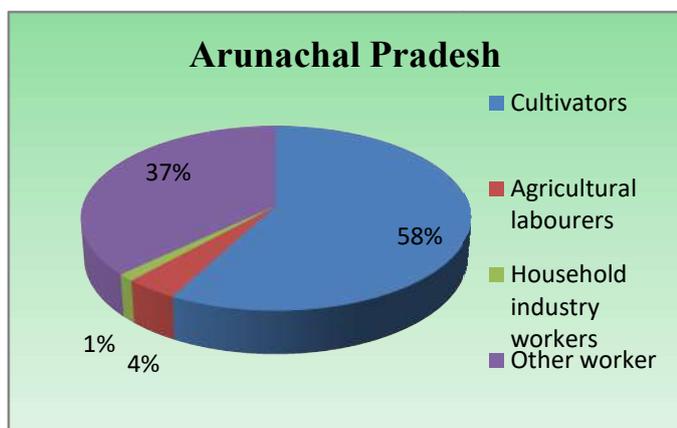
- In this pyramid the bottom heavy i.e. the population has a larger proportion of children, teenagers and young adults.
- The country's population for the age cohorts of 0-4, 5-9, 10-14 and 15-19 is roughly equal, whereas the numbers for older groups become progressively smaller.
- This means that the country's younger age groups have stopped growing in numbers now and are likely to shrink slightly soon.
- Except for the oldest groups, It have more males than females for every cohort.

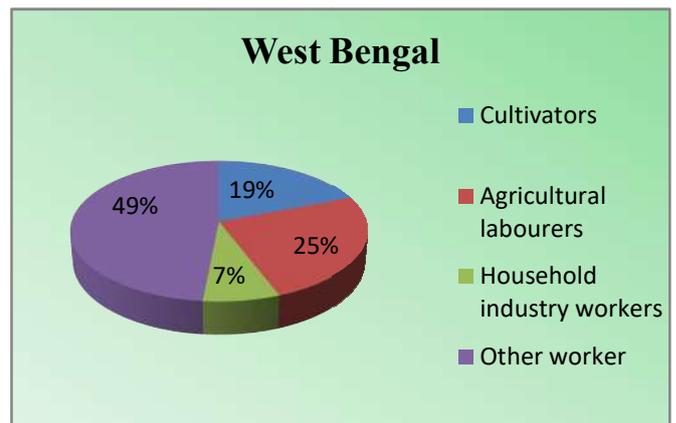
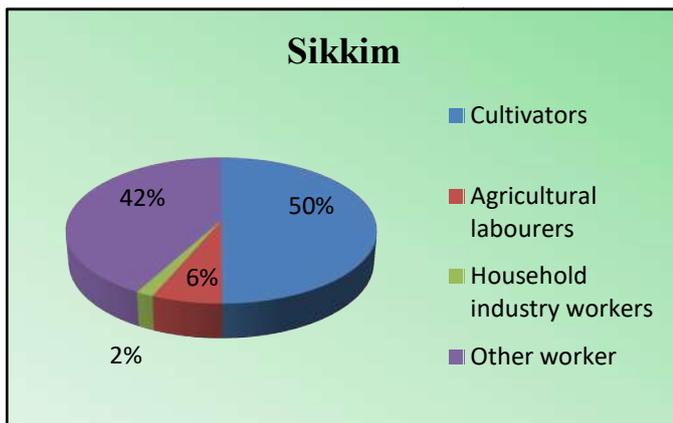
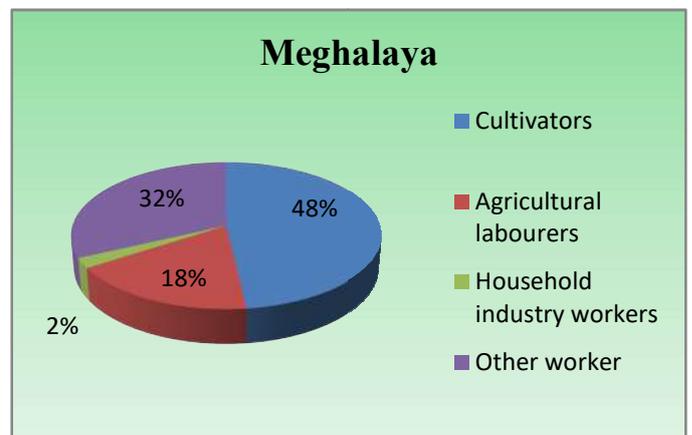
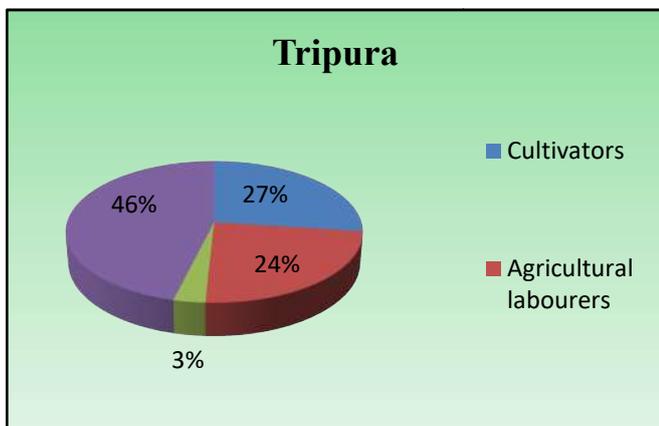
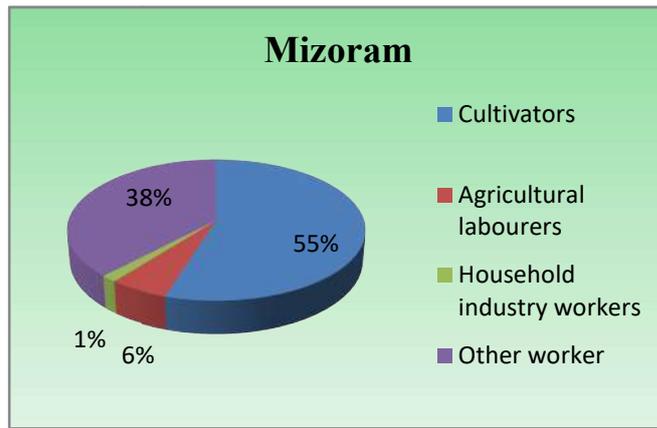
Occupational Structure

The working population takes place in various occupations ranging from agriculture, forestry, fishing, manufacturing, construction, commercial transport, services, communication and other unclassified services. Agriculture, forestry, fishing and mining are classified as primary activities, manufacturing as secondary, transport, communication and other services as tertiary and the jobs related to research and developing ideas as quaternary activities. The proportion of working population engaged in these four sectors is a good indicator of the levels of economic development of a nation. A developed economy with industries can accommodate more workers in the secondary, tertiary and quaternary sector. If the economy is in primitive stages, then the proportion of people engaged in primary activities would be high

STATES/UNION TERRITORY	CULTIVATORS	AGRICULTURAL LABOURERS	HOUSEHOLD INDUSTRY	OTHERS WORKERS
ASSAM	39.1	13.2	3.6	44
MEGHALAYA	48.1	17.7	2.2	32
MANIPUR	40.2	12	10.3	37.6
MIZORAM	54.9	5.7	1.5	37.9
NAGALAND	64.7	3.6	2.6	29
TRIPURA	27	23.8	3	46.1
ARUNACHAL PRADESH	57.8	3.9	1.3	37
SIKKIM	49.9	6.5	1.6	42
TOTAL	381.7	86.4	26.1	305.6

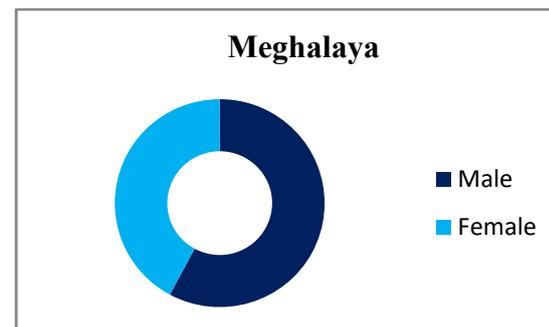
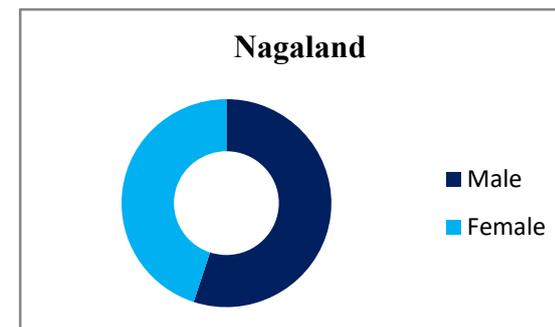
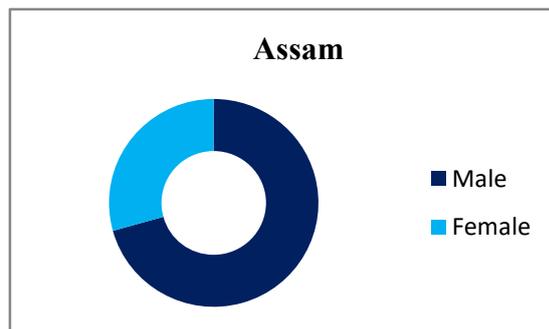
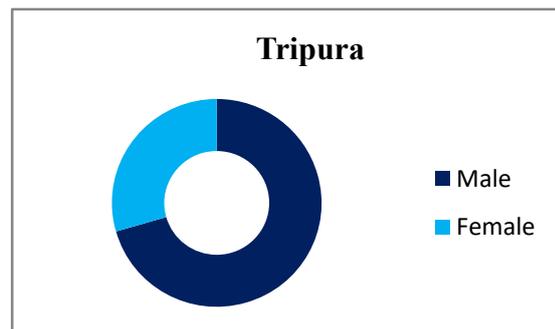
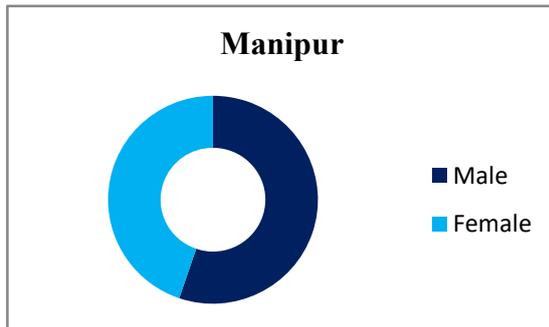
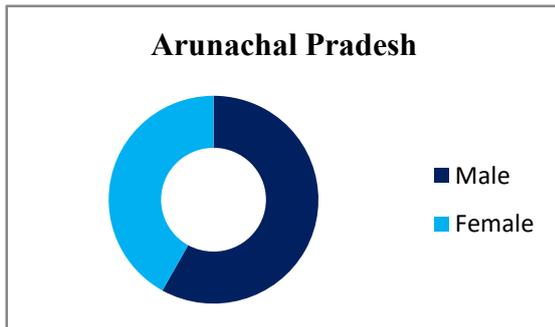
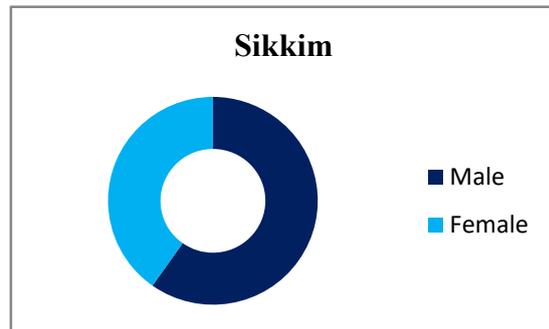
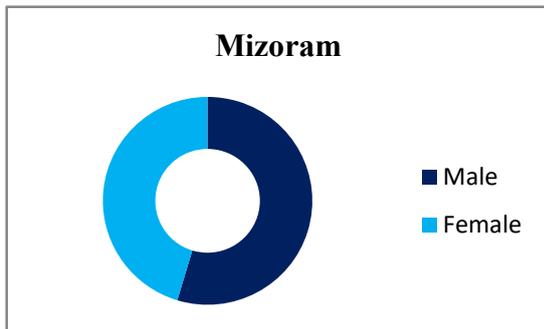
PIE Diagram Showing Distribution Of Workers By Category Of Workers





WORK PARTICIPATION RATE NORTH-EASTERN STATES OF INDIA (2001)

State	Male	Female
Mizoram	57.3	47.5
Sikkim	57.4	38.6
Arunachal Pradesh	50.6	36.5
Manipur	48.1	39
Nagaland	46.7	38.1
Meghalaya	48.3	35.1
Tripura	50.6	21.1
Assam	49.9	20.7



Dependency ratio

The dependency ratio is an agepopulation ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

Dependency ratio formula

$$\text{Dependency Ratio} = \frac{(\text{number of people aged 0 to 14}) + (\text{number of people aged 65 and over})}{\text{number of people aged 15 to 64}} \times 100$$

Migration

Human migration is the movement of people from one place in the world to another for the purpose of taking up permanent or semipermanent residence, usually across a political boundary. Migration People can either choose to move ("voluntary migration") or be forced to move ("involuntary migration"). Migration occurs at a variety of scales: intercontinental (between continents), intracontinental (between countries on a given continent), and interregional (within countries).

Migration One of the most significant migration patterns has been Rural to Urban migration—the movement of people from the countryside to cities in search of opportunities.

- **FACTORS OF MIGRATION**

Migration is a **global phenomenon** caused not only by economic factors but many other factors like **social, political, cultural, environmental, health, education** are included under the broader classification of **Push and Pull factors** of migration:

Push-factors Countries of origin	Migrants	Pull Countries
⇒ Population growth, young age structure	Demographic factors and social infrastructure	⇒ Stable population decline, decrease
⇒ Inadequate educational institutions, Medicare and social security		⇒ Welfare educational Medicare, s
⇒ Unemployment, low wages	Economic factors	⇒ Labour demand
⇒ Poverty, low consumption and living standard		⇒ Welfare, and living s
⇒ Dictatorships, shadow democracy, bad governance, political upheaval	Political factors	⇒ Democracy pluralism, p
⇒ Conflict, (civil) war, terrorism, human rights violation, oppression of minorities		⇒ Peace, security human a protection e
⇒ Ecologic disaster, desertification, lack of natural resources, water shortage, soil	Ecological factors	⇒ Better environment protection

Push Factor: Push factors are those that **compel** a person, due to different reasons, to leave a place of **origin** (out-migration) and migrate to some other place.

Pull Factor: Pull factors indicate the factors which **attract** migrant (in-migration) to an area (destination).

Types of migration

- **internal migration:** moving within a state, country, or continent
- **external migration:** moving to a different state, country, or continent
- **emigration:** leaving one country to move to another
- **immigration:** moving into a new country
- **return migration:** moving back to where you came from
- **seasonal migration:** moving with each season or in response to labour or climate conditions

VITAL STATISTICS METHOD OF MIGRATION:

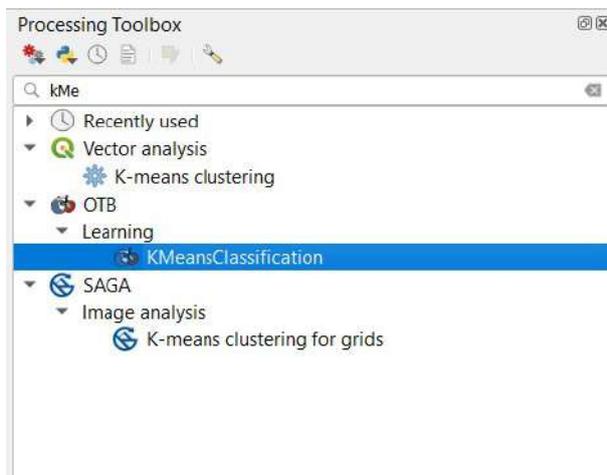
Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put in the following simple form:

$$\text{Net M} = (P_{+n}) - P_{-} - (B - D)$$

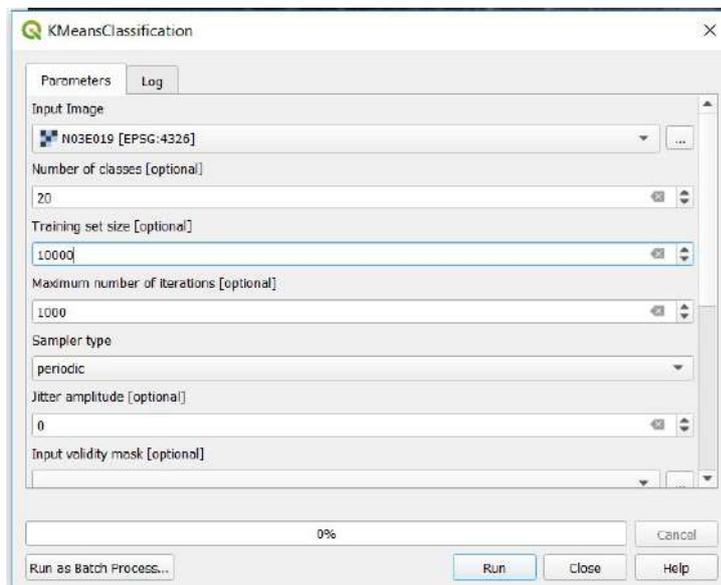
where for any given area Net M = net migration, P₋ is the population at the earlier census, P_{+n} is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to residents.

Land use map using Unsupervised classification

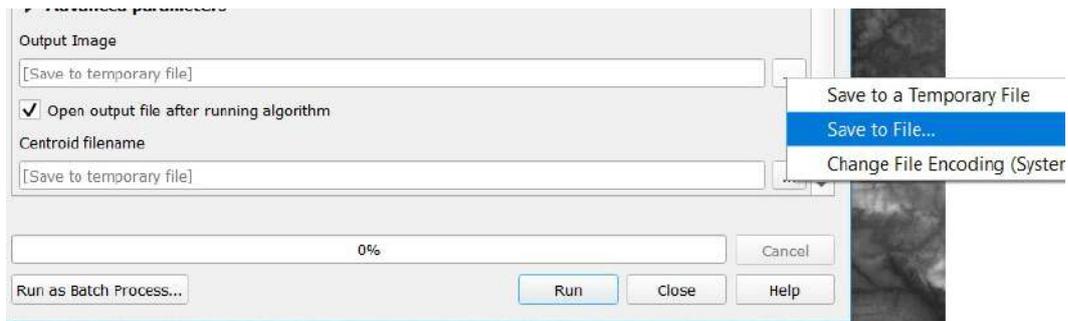
- Add a raster layer in a project **Layer >> Add Layer >> Add Raster Layer**.
- Go to the search box of Processing Toolbox , search **KMeans** and select the **KMeansClassification**.



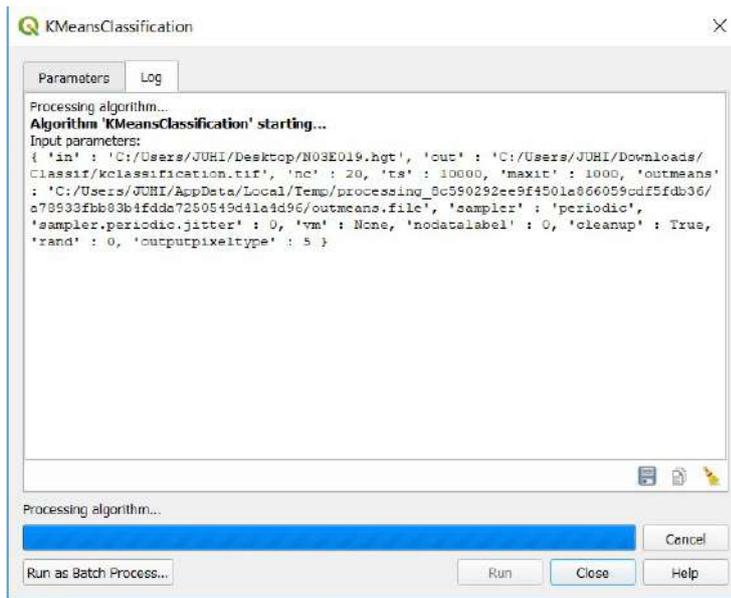
Select the input image. Type the Number of classes to 20 (default classes are 5)
Fill training size to 10000



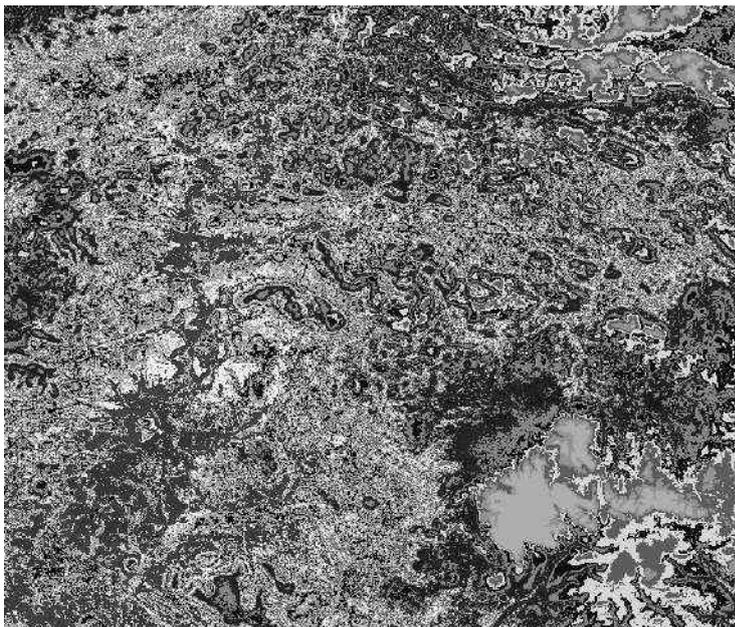
- Type the name of output image save to file.



- And in the last tap on **Run**



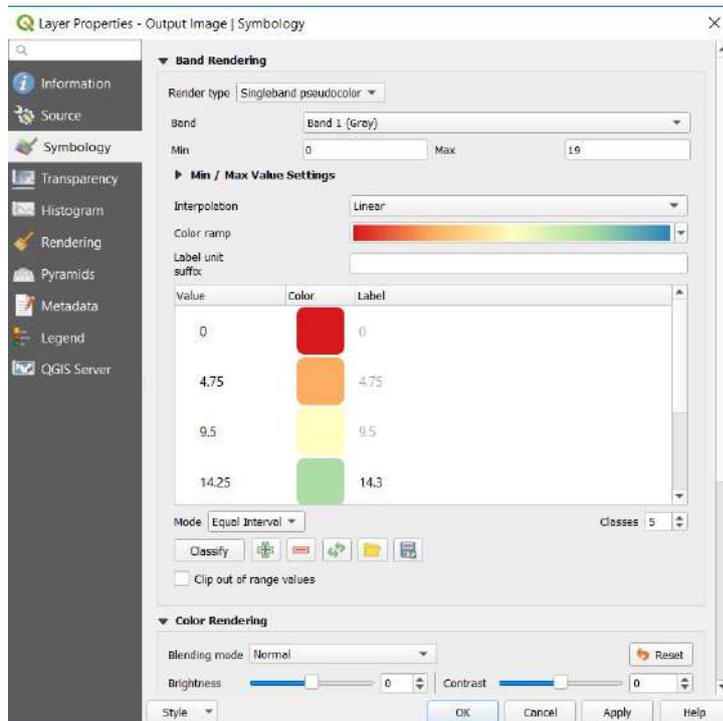
- Output image directly display on canvas. Image is shown below.



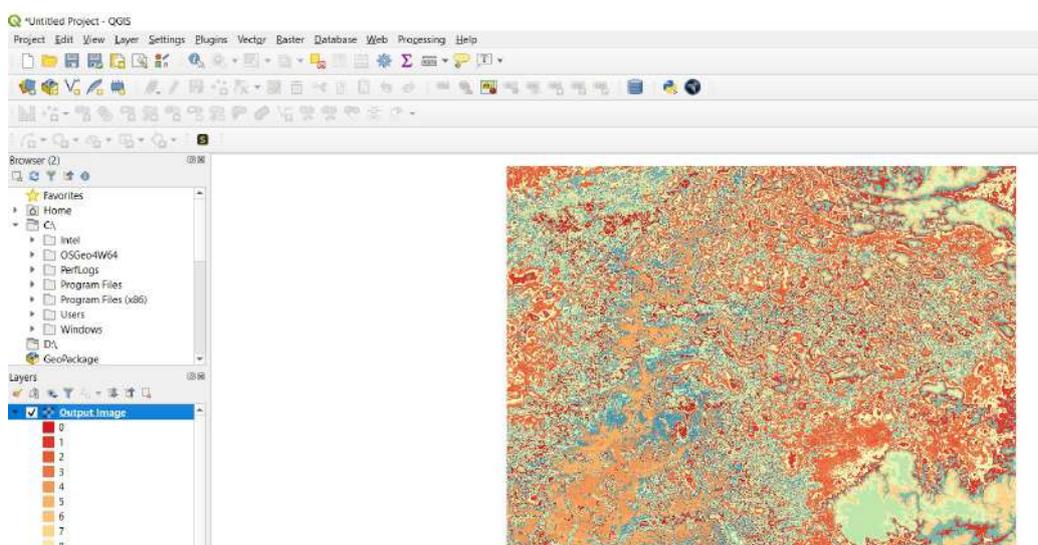
In the layer panel, right click on the output layer and select **Properties >> Symbology**. Change Render Type **SinglebandPseudocolor**.

- Select the **Color Ramp** (we selected spectral)
- Choose Mode **Equal Interval** (default selection is continous)

Change the number of **classes** from 5 to **20**.

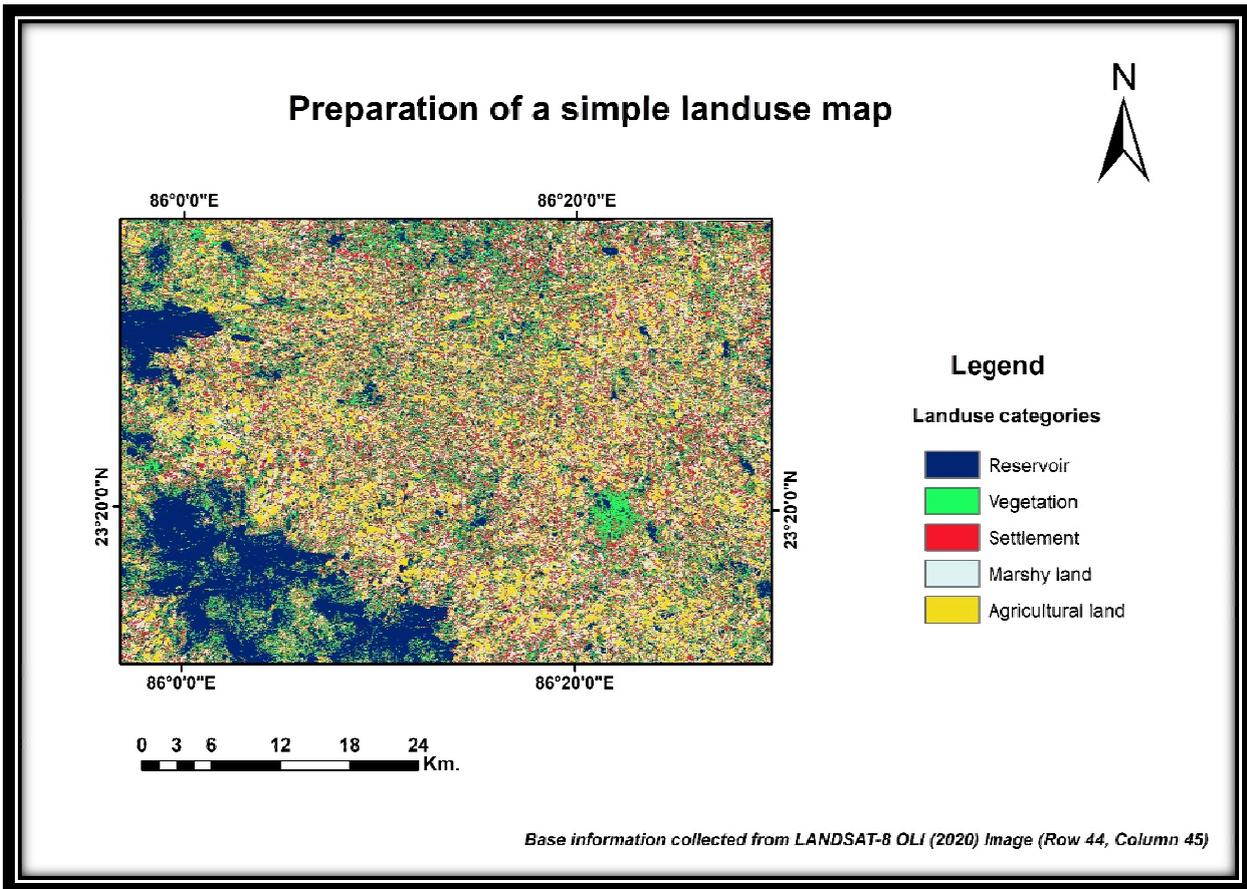


In the last click on **OK**. Output image is provided below. You can also classify according to discrete interpolation if desired



This is all about unsupervised classification using KMeansClassification. If you face any problem in implementing then please do comment.

Preparation of a simple landuse map



Interpretation:

The study area is Bankura District, is a region of West Bengal. This region have various of land use and cover features.

- **Land cover:** It is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground water etc. Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water.
- **Land use:** It not only shows how people use the landscape but also utilization of land resources naturally. Therefore, the land of a particular region can be used for the purpose of infrastructural development, settlements, amusement & recreation, conservation of wildlife and wildlife habitat, agriculture & farming or mixed uses and can be defined as 'land use'. Land use applications involve both baseline mapping and subsequent monitoring, since timely information is required to know what current quantity of land is in what type of use and to identify the land use changes from year to year.

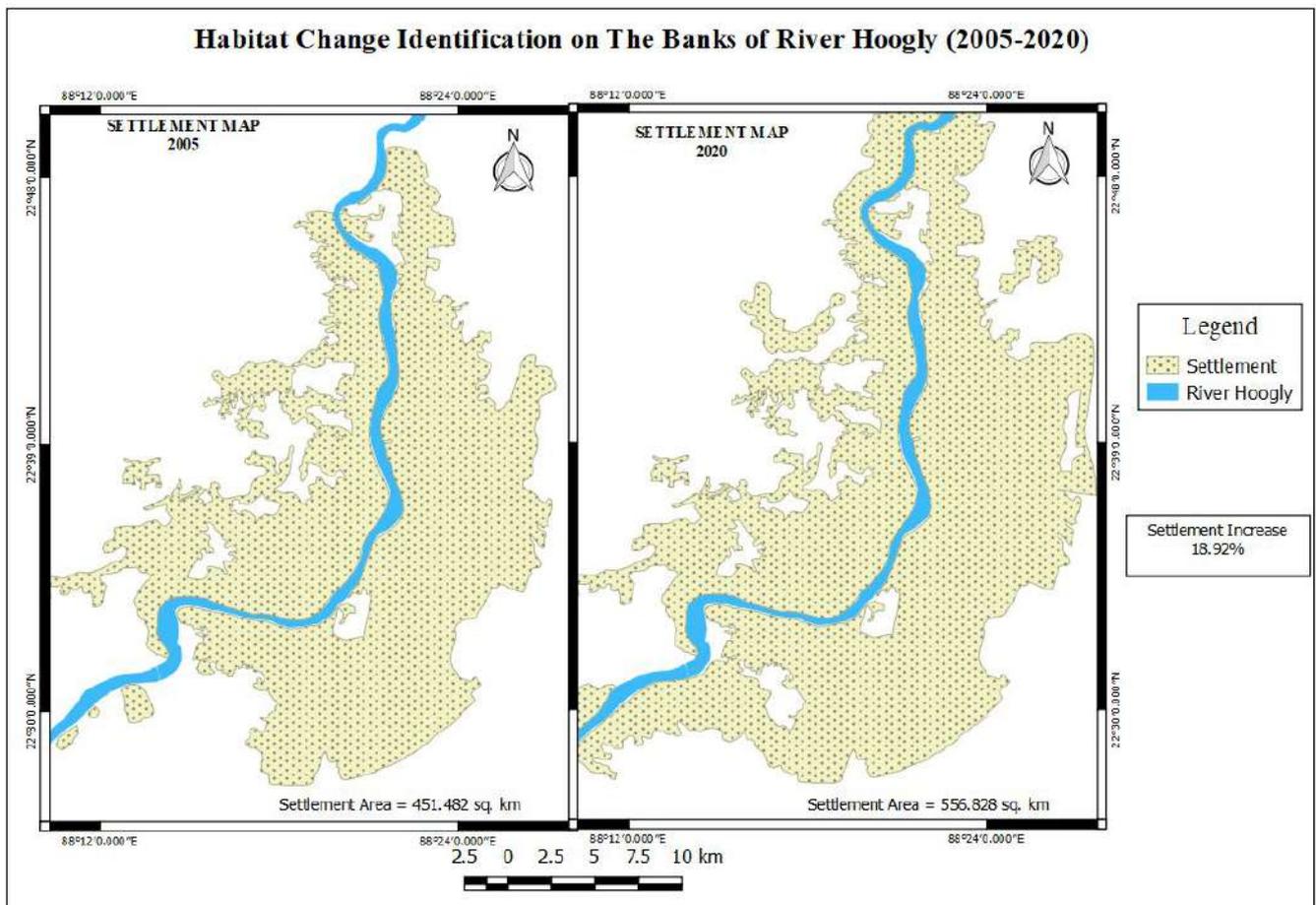
- **Vegetation:** Deciduous forest is mainly dominated by woody vegetation cover, i.e., >60% along with average plant height more than 2 metre. The floral communities dominated by the trees which hold broadleaves with an inimitable feature of annual cycle of leaf-on and leaf-off periods means the trees shed their leaves at a particular season of each year, mainly in late winter. Dense forest like Khatra, Ranibandh, Bishnupur, Sonamukhi, Bojora, Gangajal ghati occupies huge areas of the district, Bankura. Currently the land under forest department is approximately 21.5%. About 48% of the forest in this district is degraded type and alarmingly the forest/plant cover is depleting gradually. In addition to ecological utilities, the forests in this district also serve as the basis of livelihood of poor communities of the rural area and the tribes as well. Forests not only provide money but also are important for energy resources in form of fuel and forage for the disadvantaged folks. This type of forest mainly located West, East and South part of the district.

- **Cropland:** Temporarily cropped area followed by harvest and a bare soil period (e.g., single and multiple cropping systems). Different types of crop cultivation and cropping arrangement are specified according to the seasons (e.g., kharif, rabi, zaid). Cropland includes areas are used for the common crop production and are also used for the adapted crops for harvest. Agriculture in Bankura district is dominated by paddy cultivation in kharif season and mustard cultivation in rabi season. A large number of landraces of rice were cultivated by the tribal and rural community of farmers of Bankura district, so far 65 folk rice varieties are produced from Bankura District of West Bengal viz., Dharnagra, Suakalma, Vutmuri, Tulsibhog, Sitasal, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, Badsahabhog, Raghusal, Bhurisal, Khajurchari, Gangajali, Basmati and Kataribhog. Other crops are paddy, wheat, sugarcane, oilseeds etc.,

- **Water Body:** Bankura is drained by three major rivers e.g., Damodar, Darkeswar and Kangsabati along with their tributaries as Gandheswari, Silai and Kumari deserves special consideration. The rivers of the area are flowing from the north-east to the south-west in courses roughly parallel to one another. They are mostly rain-fed, hill streams, originating from hills in the west. The rivers come down in floods after heavy rains and subside as rapidly as they rise. In summer, their sand beds are almost always dry. Damodar river forms the northern boundary of the district along with Bardhaman district for about 72 kilometres and then flows into Bardhaman district. Saliriver which is one of the important tributaries of the Damodar, drains the northern part of the district.

- **Settlement:** Settlement is one of the major land use features. In the study area here almost every place has settlement. Mainly centre to east part of the district are dense population.
- **Upland:** Here I also noticed that the south, middle and west part of the district have some of uplands. Maximum river are generated from this area.

Human Habitation and Detection of Change from Two Satellite Image of (2005- 2020)



Interpretation:

Here we can see some changes of settlement on both sides of river Hooghly. According to our calculation settlement increases around 19% from 2005 to 2020. Mainly south part of map settlement increase massively. Where in 2005 the settlement area was only 451.48 sq.km. on 10km buffer of the river it increases in 2020 in 556.83 sq.km.. West part of the river is maximum settlement increase then the left part.

Spatial Plan Formulation and Layout Map of a Gram Panchayat

Step 1-Collect Mouza map from following Gram Panchyat.

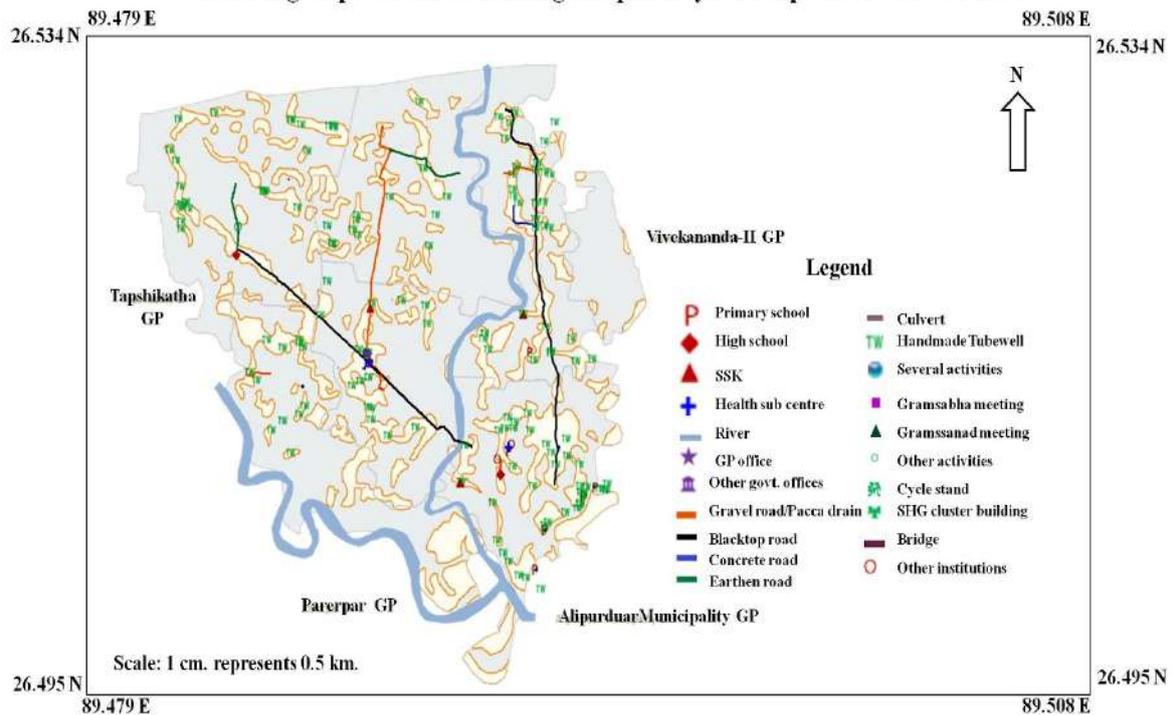
Step 2. Then using QGIS Georeference the the Mouza Map and clip the particular the village Boundary.

Step 3. Using GPS survey I collect every impotent place of the village like school, police station, any administrative building etc. it find from gram panchyat by secondary data.

Step4. Plot the places as a point and digitized settlements also Roads using Qgis.

Step 5. At the end prepare a layout map and add legends, north lines, scale and heading of the map.

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation:

Banchukamari is a Village in Alipurduar-i Block in Jalpaiguri District of West Bengal State, India. It belongs to Jalpaiguri Division . It is located 89 KM towards East from District head quarters Jalpaiguri. 4 KM from Alipurduar-I. 530 KM from State capital Kolkata. In this village planning map I put every impotent features. Here we see in village have 2 river one is run west boundary of the village and another is running centre part of the village. I noticed right sight of Centre River have maximum primary school then other side of the river. Also noticed here 2 high school one is west part of village and another is south east part of the village. Handmade tube well is available everywhere in the village. But here only 2 hospital or health centre located in the village. Centre of the village have Gram panchyat and govt. Offices. Here also noticed 2 SSK and one other institution.

NAME-BIDISHA DAS

ROLL NO. BGC/MGF/SIV/21 NO. 316

RESEARCH METHODS AND METHODOLOGY

MEANING OF RESEARCH

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge."¹ Redman and Mory define research as a "systematized effort to gain new knowledge."² Some people consider research as a movement, a movement from the known to the unknown. It is actually a voyage of discovery.

OBJECTIVES OF RESEARCH

- The purpose of research is to discover answers to questions through the application of scientific procedures.
- The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.
- Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:
- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies)
- To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies)
- To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies)
- To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

TYPES OF RESEARCH

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

There are a variety of approaches to research in any field of investigation, irrespective of whether it is applied research or basic research. Each particular research study will be unique in some ways because of the particular time, setting, environment, and place in which it is being undertaken.

Nevertheless, all research endeavours share a common goal of furthering our understanding of the problem and thus all traverse through certain basic stages, forming a process called the **research process**.

These 8 stages in the research process are;

1. Identifying the problem.
2. Reviewing literature.
3. Setting research questions, objectives, and hypotheses.
4. Choosing the study design.
5. Deciding on the sample design.
6. Collecting data.
7. Processing and analyzing data.
8. Writing the report.

Step – 1: Identifying the Problem

The first and foremost task in the entire process of scientific research is to identify a research problem.

A well-identified problem will lead the researcher to accomplish all-important phases of the research process, starting from setting objectives to the selection of the research methodology.

Step – 2: Reviewing literature

A literature review is a survey of scholarly sources on a specific topic. It provides an overview of current knowledge, allowing you to identify relevant theories, methods, and gaps in the existing research.

Identify literature gap:

After completed literature review researchers should find the gap, also considered the missing piece or pieces in the research literature, is the area that has not yet been explored or is under-explored. This could be a population or sample (size, type, location, etc.), research method, data collection and/or analysis, or other research variables or conditions.

- **RESEARCH PROBLEM**

A research problem is a specific issue, difficulty, contradiction, or gap in knowledge that you will aim to address in your research. You might look for practical problems aimed at contributing to change, or theoretical problems aimed at expanding knowledge.

Step- 3: Setting research questions, objectives, and hypotheses

After discovering and defining the research problem, researchers should make a formal statement of the problem leading to research objectives.

An **objective** will precisely say what should be researched, to delineate the type of information that should be collected, and provide a framework for the scope of the study. The best expression of a research objective is a well-formulated, testable research hypothesis.

A **hypothesis** is an unproven statement or proposition that can be refuted or supported by empirical data. Hypothetical statements assert a possible answer to a research question.

Step -4: Choosing the study design

The **research design** is the blueprint or framework for fulfilling objectives and answering research questions.

It is a master plan specifying the methods and procedures for collecting, processing, and analyzing the collected data. There are four basic research designs that a researcher can use to conduct his or her study;

1. survey,
2. experiment,
3. secondary data study, and
4. observational study.

Step – 5: Deciding on the sample design

Sampling is an important and separate step in the research process. The basic idea of sampling is that it involves any procedure that uses a relatively small number of items or portions (called a sample) of a universe (called population) to conclude the whole population.

Step-6: Collecting data.

While deciding about the method of data collection to be used for the study, the researcher should keep in mind two types of data viz., primary and secondary. The primary data are those which are collected afresh and for the first time, and thus happen to be original in character. The secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process.

Step-7: Processing and Analyzing Data

The data, after collection, has to be processed and analysed in accordance with the outline laid down for the purpose at the time of developing the research plan. This is essential for a scientific study and for ensuring that we have all relevant data for making contemplated comparisons and analysis.

Step-8: Writing the report

This is the final steps when researcher write a brief description of the research work, It involves above steps to present the report in the form of thesis or Dissertation.



Focus Group Discussion (FGD)

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.

- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

TECHNIQUES AND FORMULATION OF RURAL PLANNING THOUGHT DATA ANALYSIS

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a [company's competitive position](#) and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts.

Strengths

Strengths describe what an organization excels at and what [separates it from the competition](#): a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

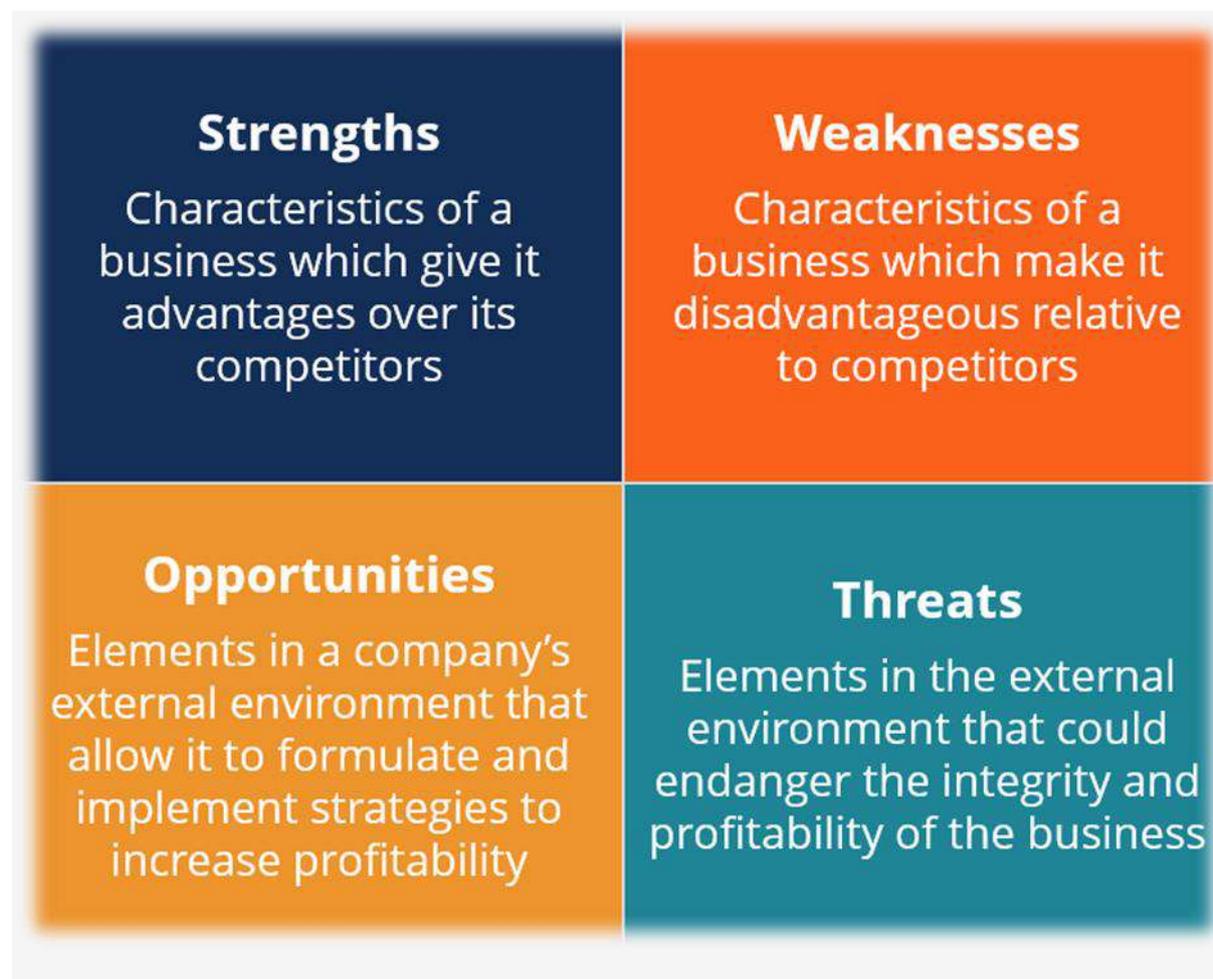
Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favorable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and [market share](#).

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.



Population composition

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

The age structure

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way, people live their lives.

The sex ratio

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population.

In some countries, like U.S.A, the sex ratio is expressed in terms of number of males per thousand females and is calculated by using the formula:

$$\frac{\textit{Male population}}{\textit{Female population}} \times 1000$$

Or the number of males per thousand females.

In India, the sex ratio is calculated in terms of number of females per thousand males. It is calculated as under

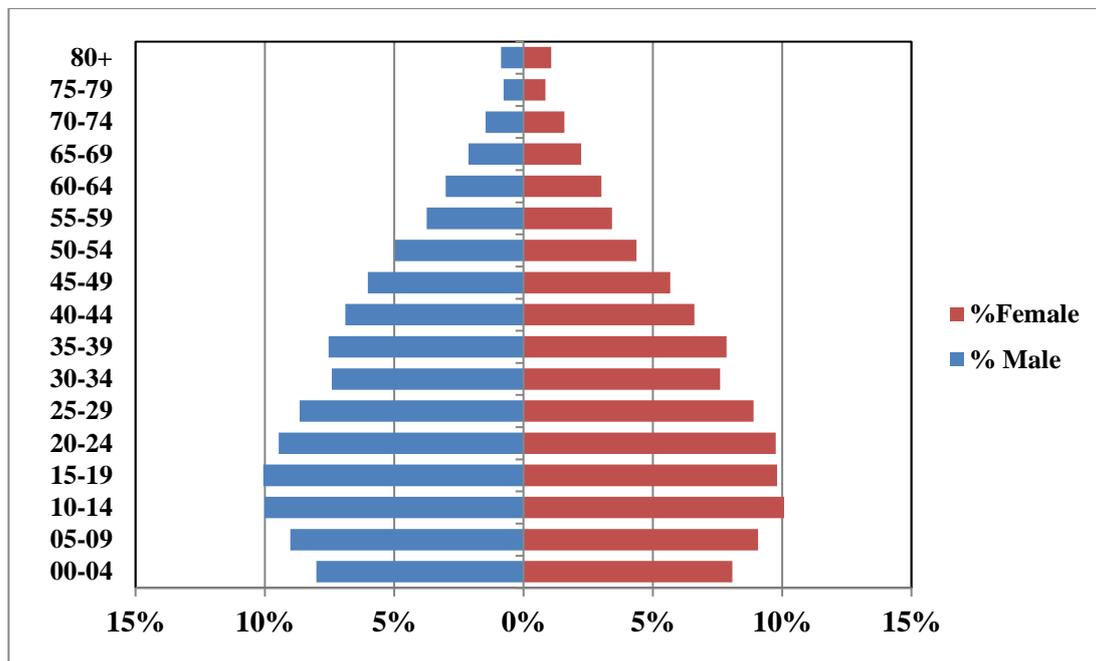
$$\frac{\textit{Male population}}{\textit{Female population}} \times 1000$$

Or the number of females per thousand males.

Population pyramid

Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

AGE-SEX PYRAMID



- In this pyramid the bottom heavy i.e. the population has a larger proportion of children, teenagers and young adults.
- The country's population for the age cohorts of 0-4, 5-9, 10-14 and 15-19 is roughly equal, whereas the numbers for older groups become progressively smaller.
- This means that the country's younger age groups have stopped growing in numbers now and are likely to shrink slightly soon.
- Except for the oldest groups, It have more males than females for every cohort.

Occupational Structure

The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a country who are employed in different sectors like agriculture, manufacturing and transport, among many others constitute the occupational structure of a nation.

Different nations have varied percentages of the population working in various sectors. A developing country like India had and continues to have a fair share of its population employed in agricultural and manufacturing divisions. In contrast, developed countries like the USA have a major share of people working in technology and research.

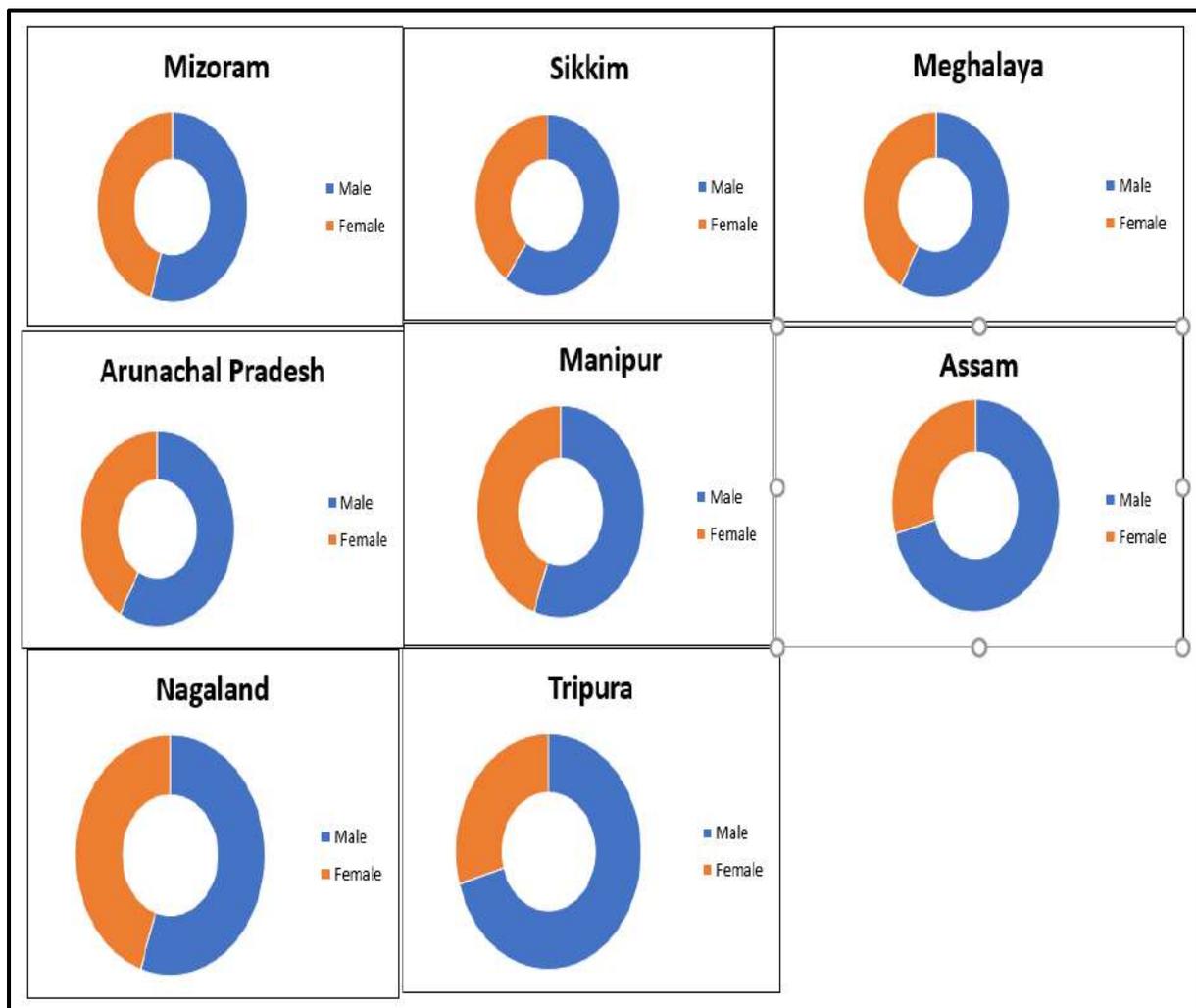
INDUSTRIAL COMPOSITION, NORTH INDIAN STATES, 2001

STATES/UNION TERRITORY	CULTIVATORS	AGRICULTURAL LABOURERS	HOUSEHOLD INDUSTRY	OTHERS WORKERS
ASSAM	39.1	13.2	3.6	44
MEGHALAYA	48.1	17.7	2.2	32
MANIPUR	40.2	12	10.3	37.6
MIZORAM	54.9	5.7	1.5	37.9
NAGALAND	64.7	3.6	2.6	29
TRIPURA	27	23.8	3	46.1
ARUNACHAL PRADESH	57.8	3.9	1.3	37
SIKKIM	49.9	6.5	1.6	42
TOTAL	381.7	86.4	26.1	305.6

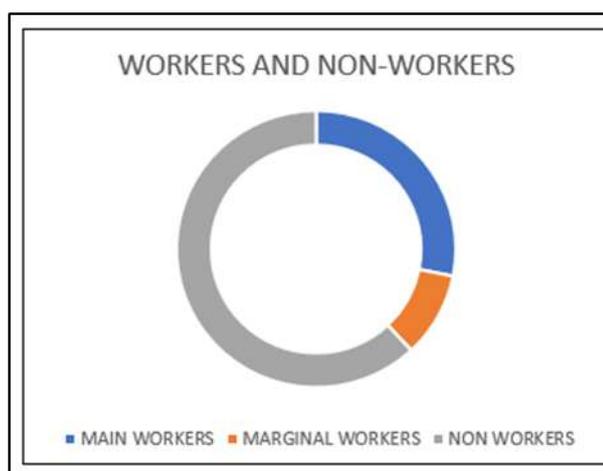
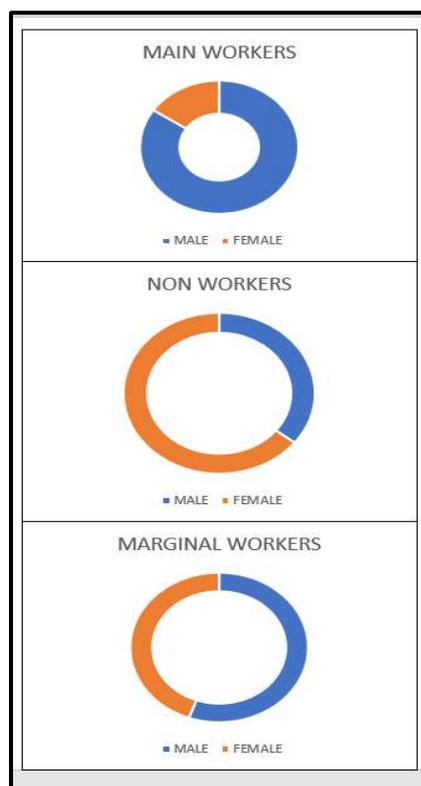


WORK PARTICIPATION RATE NORTH-EASTERN STATES OF INDIA (2001)

India: Work Participation Rate North-Eastern States (2001)			
State	Male	Female	
Mizoram	57.3	47.5	
Sikkim	57.4	38.6	
Arunachal	50.6	36.5	
Manipur	48.1	39	
Nagaland	46.7	38.1	
Meghalaya	48.3	35.1	
Tripura	50.6	21.1	
Assam	49.9	20.7	
Total	408.9	276.6	



WORKERS AND NONWORKERS			
	MALE	FEMALE	TOTAL
MAIN WORKERS	21678279	4008351	25686630
MARGINAL WORKERS	5037768	4031957	9069725
NON WORKERS	20092980	36426780	56519760



Dependency ratio

The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

Dependency ratio formula

$$\text{Dependency Ratio} = \frac{(\text{number of people aged 0 to 14}) + (\text{number of people aged 65 and over})}{\text{number of people aged 15 to 64}} \times 100$$

Migration

Human migration is the movement of people from one place in the world to another for the purpose of taking up permanent or semipermanent residence, usually across a political boundary. Migration

People can either choose to move (“voluntary migration”) or be forced to move (“involuntary migration”). Migration occurs at a variety of scales: intercontinental (between continents), intracontinental (between countries on a given continent), and interregional (within countries).

Migration One of the most significant migration patterns has been Rural to Urban migration—the movement of people from the countryside to cities in search of opportunities.

FACTORS OF MIGRATION

Migration is a **global phenomenon** caused not only by economic factors but many other factors like **social, political, cultural, environmental, health, education** are included under the broader classification of **Push and Pull factors** of migration:

Push-factors Countries of origin	Migrants	Pull-factors Countries of destination
⇒ Population growth, young age structure ⇒ Inadequate educational institutions, medicare and social security	Demographic factors and social infrastructure	⇒ Stable population, population decline, demographic ageing ⇒ Welfare state benefits, educational institutions, medicare, social security
⇒ Unemployment, low wages ⇒ Poverty, low consumption and living standard	Economic factors	⇒ Labour demand, high wages ⇒ Welfare, high consumption and living standard
⇒ Dictatorships, shadow democracy, bad governance, political upheaval ⇒ Conflict, (civil) war, terrorism, human rights violation, oppression of minorities	Political factors	⇒ Democracy, rule of law, pluralism, political stability ⇒ Peace, security, protection of human and civil rights, protection of minorities
⇒ Ecologic disaster, desertification, lack of natural resources, water shortage, soil erosion, lack of environmental policy	Ecological factors	⇒ Better environment, environmental policy, protection of natural resources and environmental protection
⇒ Decisions of the family or the clan ⇒ Information flows, media,	Migrant flows and migrant stocks	⇒ Diaspora, ethnic community ⇒ Information flows, media, transferred picture of

Push Factor: Push factors are those that **compel** a person, due to different reasons, to leave a place of **origin** (out-migration) and migrate to some other place.

Pull Factor: Pull factors indicate the factors which **attract** migrant (in-migration) to an area (destination).

Types of migration

- **internal migration:** moving within a state, country, or continent
- **external migration:** moving to a different state, country, or continent
- **emigration:** leaving one country to move to another
- **immigration:** moving into a new country
- **return migration:** moving back to where you came from
- **seasonal migration:** moving with each season or in response to labour or climate conditions

VITAL STATISTICS METHOD OF MIGRATION:

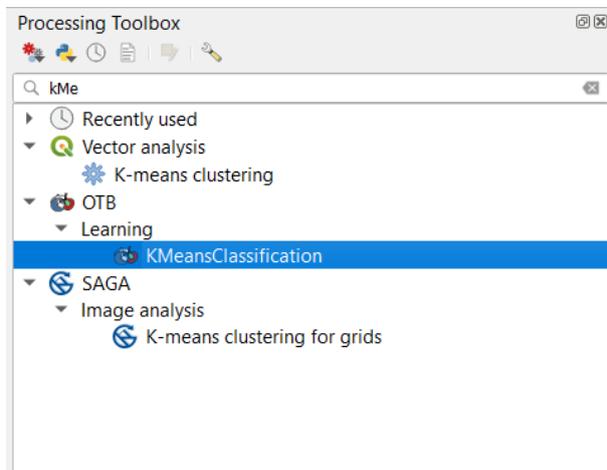
Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This “balancing equation” can be put in the following simple form:

$$\text{Net M} = (P.+n)-P.- (B-D)$$

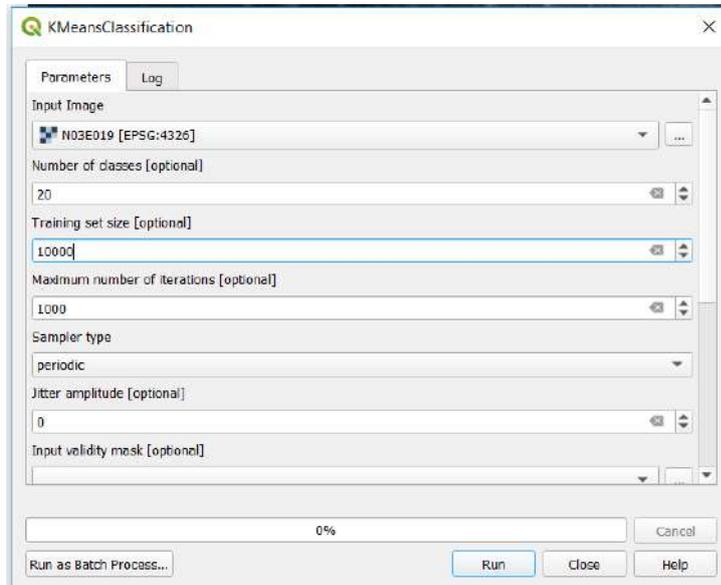
where for any given area *Net M = net migration*, *P.* is the population at the earlier census, *P.+n* is the population at the later census, *B* is the number of births that occurred to residents of the area during the intercensal period, and *D* is the number of deaths that occurred to residents.

UNSUPERVISED CLASSIFICATION USING KMEANS CLASSIFICATION IN QGIS

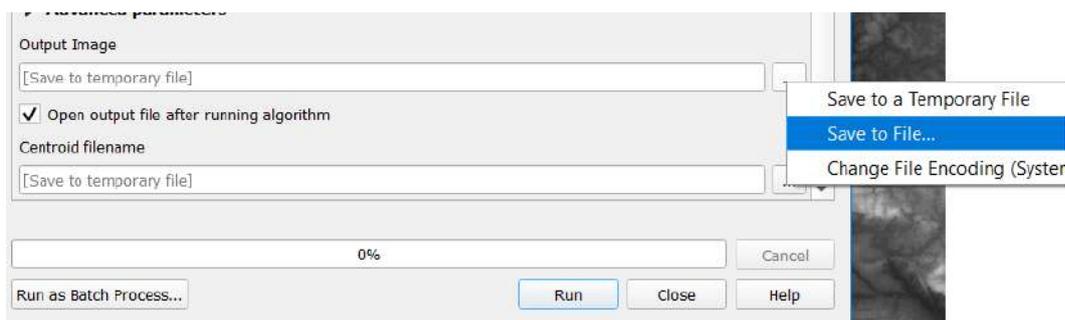
- Add a raster layer in a project **Layer >> Add Layer >> Add Raster Layer.**
- Go to the search box of Processing Toolbox , search **Kmeans** and select the **KmeansClassification.**



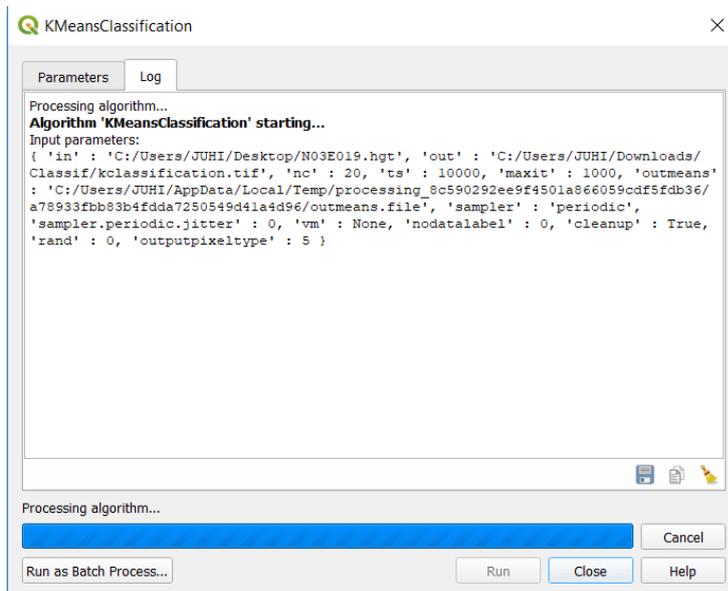
Select the input image. Type the Number of classes to 20 (default classes are 5)
Fill training size to 10000



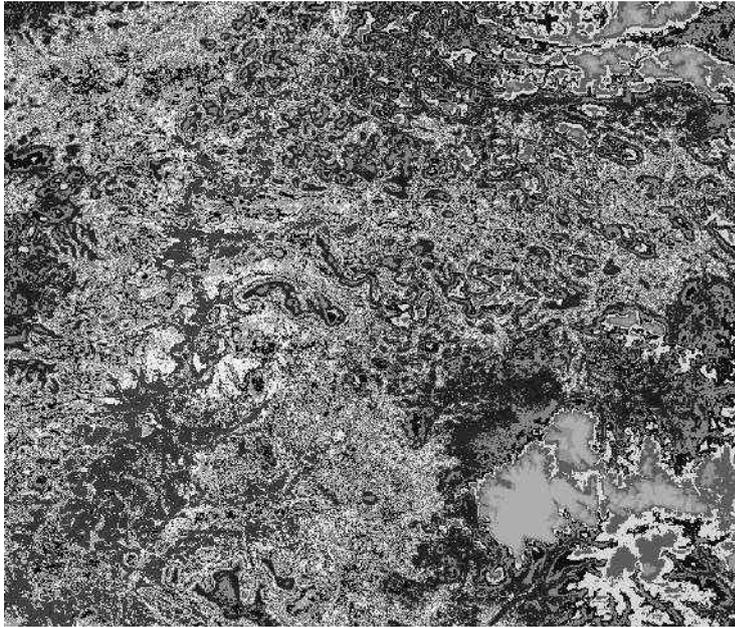
- Type the name of output image save to file.



- And in the last tap on **Run**



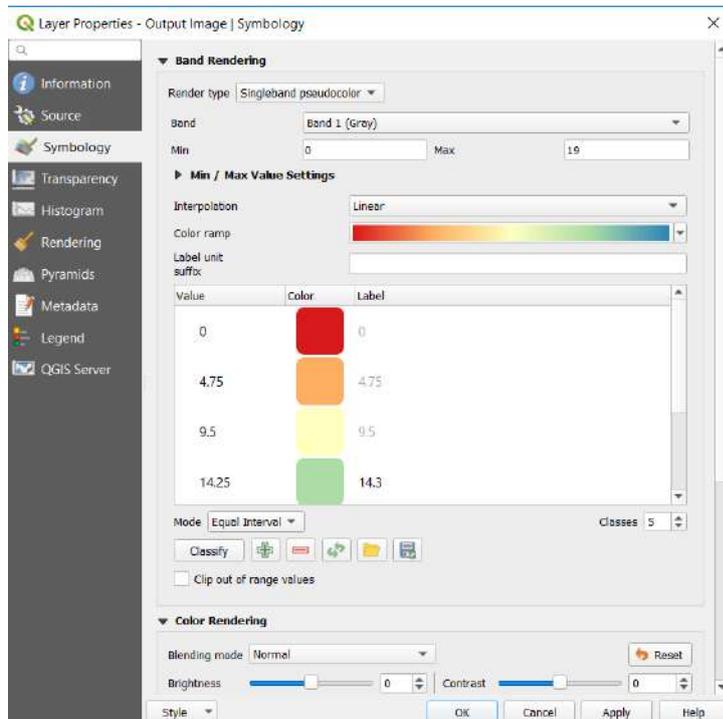
- Output image directly display on canvas. Image is shown below.



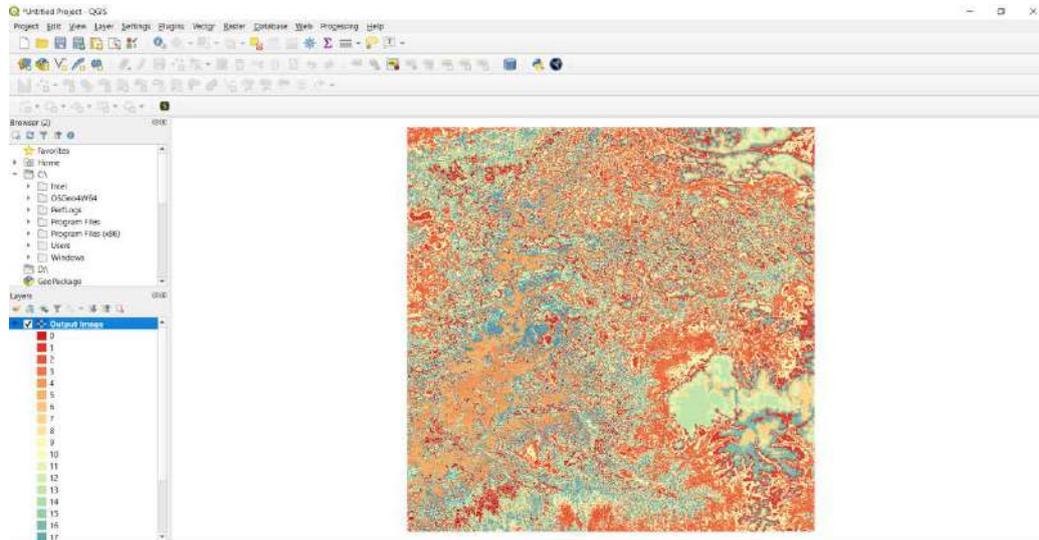
In the layer panel, right click on the output layer and select **Properties >> Symbology**. Change Render Type **Singleband Pseudocolor**.

- Select the **Color Ramp** (we selected spectral)
- Choose Mode **Equal Interval** (default selection is 16anchayat16)

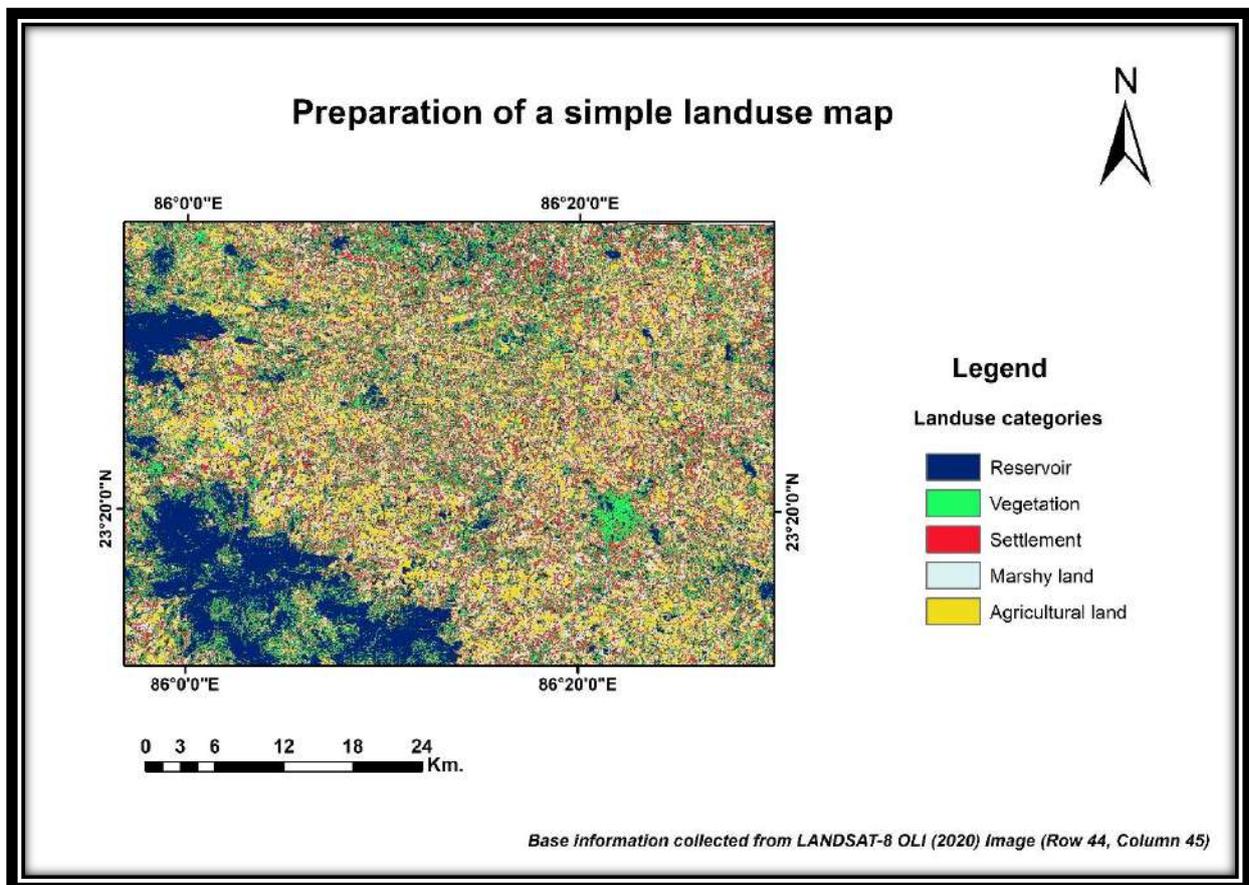
Change the number of **classes** from 5 to **20**.



In the last click on **OK**. Output image is provided below. You can also classify according to discrete interpolation if desired



This is all about unsupervised classification using KmeansClassification. If you face any problem in implementing then please do comment.



Interpretation:

INTRODUCTION

The study area is Bankura District, is a region of West Bengal. This region have various of land use and cover features.

- **Land cover:** It is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground water etc. Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water.
- **Land use:** It not only shows how people use the landscape but also utilization of land resources naturally. Therefore, the land of a particular region can be used for the purpose of infrastructural development, settlements, amusement & recreation, conservation of wildlife and wildlife habitat, agriculture & farming or mixed uses and can be defined as 'land use'. Land use applications involve both baseline mapping and subsequent monitoring, since timely information is required to know what current quantity of land is in what type of use and to identify the land use changes from year to year.
 - **Vegetation:** Deciduous forest is mainly dominated by woody vegetation cover, i.e., >60% along with average plant height more than 2 metre. The floral communities dominated by the trees which hold broadleaves with an inimitable feature of annual cycle of leaf-on and leaf-off periods means the trees shed their leaves at a particular season of each year, mainly in late winter. Dense forest like Khatra, Ranibandh, Bishnupur, Sonamukhi, Bojora, Gangajal ghati occupies huge areas of the district, Bankura. Currently the land under forest department is approximately 21.5%. About 48% of the forest in this district is degraded type and alarmingly the forest/plant cover is depleting gradually. In addition to ecological utilities, the forests in this district also serve as the basis of livelihood of poor communities of the rural area and the tribes as well. Forests not only provide money but also are important for energy resources in form of fuel and forage for the disadvantaged folks. This type of forest mainly located West, East and South part of the district.
 - **Cropland:** Temporarily cropped area followed by harvest and a bare soil period (e.g., single and multiple cropping systems). Different types of crop cultivation and cropping arrangement are specified according to the seasons (e.g., kharif, rabi, zaid). Cropland includes areas are used for the common crop production and are also used for the adapted crops for harvest. Agriculture in Bankura district is dominated by paddy cultivation in kharif season and mustard

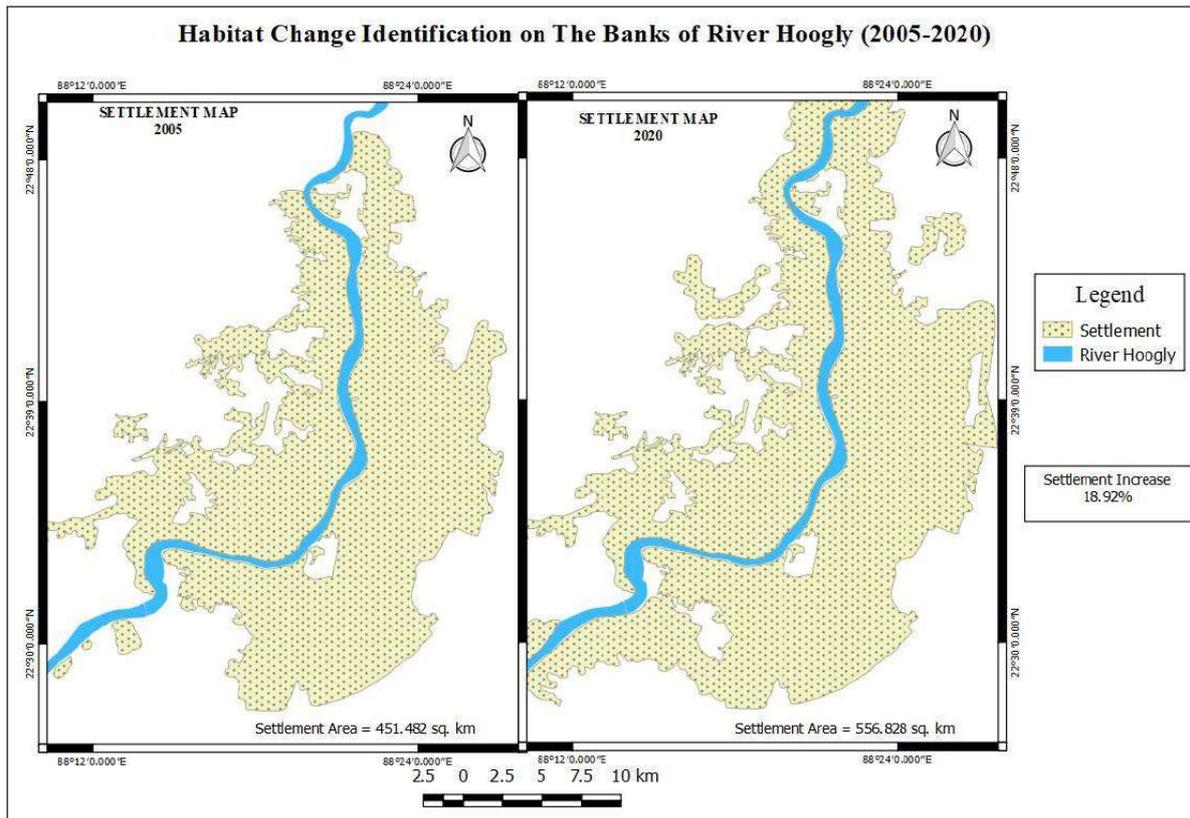
cultivation in rabi season. A large number of landraces of rice were cultivated by the tribal and rural community of farmers of Bankura district, so far 65 folk rice varieties are produced from Bankura District of West Bengal viz., Dharnagra, Suakalma, Vutmuri, Tulsibhog, Sitala, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, Badsahabhog, Raghusal, Bhurisal, Khajurchari, Gangajali, Basmati and Kataribhog. Other crops are paddy, wheat, sugarcane, oilseeds etc.,

- **Water Body:** Bankura is drained by three major rivers e.g., Damodar, Darkeswar and Kangsabati along with their tributaries as Gandheswari, Silai and Kumari deserves special consideration. The rivers of the area are flowing from the north-east to the south-west in courses roughly parallel to one another. They are mostly rain-fed, hill streams, originating from hills in the west. The rivers come down in floods after heavy rains and subside as rapidly as they rise. In summer, their sand beds are almost always dry. Damodar river forms the northern boundary of the district along with Bardhaman district for about 72 kilometres and then flows into Bardhaman district. Saliriver which is one of the important tributaries of the Damodar, drains the northern part of the district.

- **Settlement:** Settlement is one of the major land use features. In the study area here almost every place has settlement. Mainly centre to east part of the district are dense population.

- **Upland:** Here I also noticed that the south, middle and west part of the district have some of uplands. Maximum river are generated from this area.

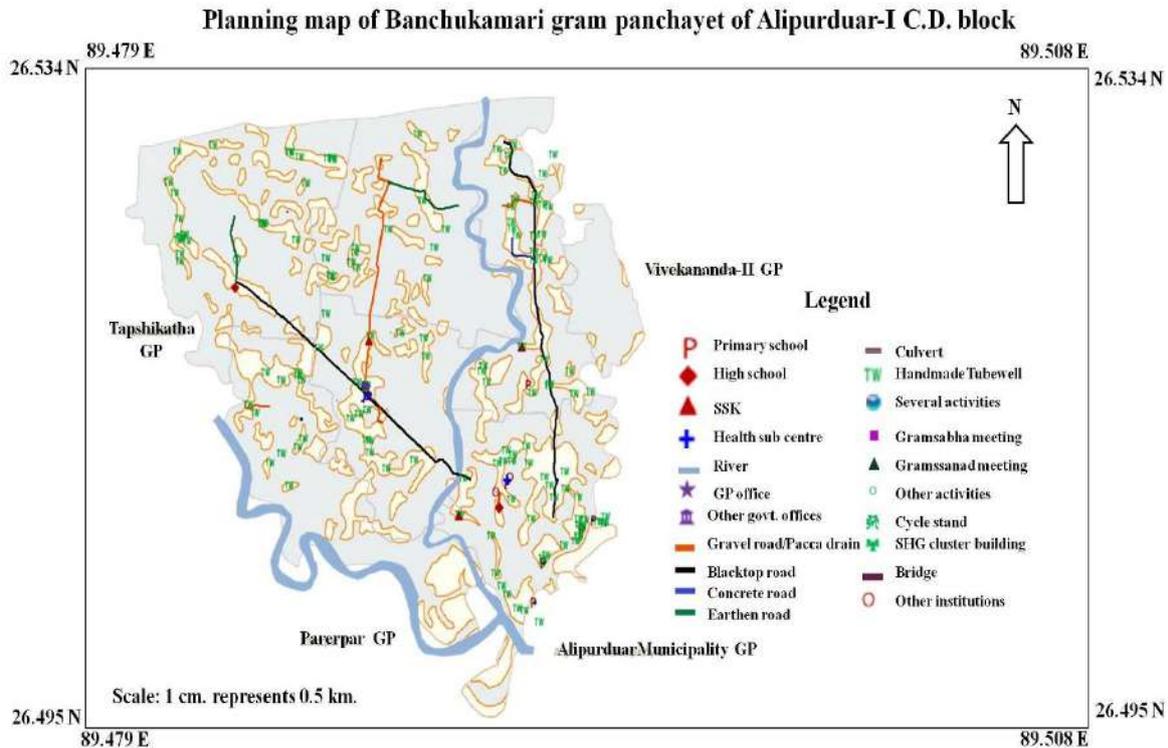
HUMAN HABITATION AND DETECTION OF CHANGE FROM TWO SATELLITE IMAGE OF (2005- 2020)



Interpretation:

Here we can see some changes of settlement on both sides of river Hooghly. Accrediting to our calculation settlement increases around 19% from 2005 to 2020. Mainly south part of map settlement increase massively. Where in 2005 the settlement area was only 451.48 sq.km. On 10km buffer of the river it increases in 2020 in 556.83 sq.km.. West part of the river is maximum settlement increase then the left part.

VILLAGE PLANING MAP OF BANCHUKAMARI GRAM PANCHAYET



Banchukamari is a Village in Alipurduar-I Block in Jalpaiguri District of West Bengal State, India. It belongs to Jalpaiguri Division . It is located 89 KM towards East from District head quarters Jalpaiguri. 4 KM from Alipurduar-I. 530 KM from State capital Kolkata. In this village planning map I put every impotent features. Here we see in village have 2 river one is run west boundary of the village and another is running centre part of the village. I noticed right sight of Centre River have maximum primary school then other side of the river. Also noticed here 2 high school one is west part of village and another is south east part of the village. Handmade tube well is available everywhere in the village. But here only 2 hospital or health centre located in the village. Centre of the village have Gram 21anchayat and govt. Offices. Here also noticed 2 SSK and one Other institution.

**REGIONAL PLANNING & RURAL
DEVELOPMENT PRACTICAL**

**Bhairab Ganguly College
(West Bengal State University)**

Department of Geography

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Semester: IV

Paper code: GEOPDSE04P

M.SC in Geography

What is Research: Definition, Methods, Types & Examples

What is Research?

Definition: Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.”

Inductive research methods analyse an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

Characteristics of research

1. Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
2. The analysis is based on logical reasoning and involves both inductive and deductive methods.
3. Real-time data and knowledge is derived from actual observations in natural settings.
4. There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
5. It creates a path for generating new questions. Existing data helps create more research opportunities.
6. It is analytical and uses all the available data so that there is no ambiguity in inference.

What is the purpose of research?

There are three main purposes:

1. **Exploratory:** As the name suggests, researchers conduct exploratory studies to explore a group of questions. The answers and analytics may not offer a conclusion to the perceived problem. It is undertaken to handle new problem areas that haven't been explored before. This exploratory process lays the foundation for more conclusive data collection and analysis.
2. **Descriptive:** It focuses on expanding knowledge on current issues through a process of data collection. Descriptive studies describe the behavior of a sample population. Only one variable is required to conduct the study. The three primary purposes of descriptive studies are describing, explaining, and validating the findings.
3. **Explanatory:** Causal or explanatory research is conducted to understand the impact of specific changes in existing standard procedures. Running experiments is the most popular form.

Types of research methods and example

Research methods are broadly classified as Qualitative and Quantitative.

Both methods have distinctive properties and data collection methods.

Qualitative methods -Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Plan to review the results and consider efficient methods to analyse and dissect results for interpretation Types of qualitative methods include:

1. One-to-one Interview
2. Focus Groups
3. Ethnographic studies
4. Text Analysis
5. Case Study

Quantitative methods -Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

Types of quantitative methods include:

1. Survey research
2. Descriptive research
3. Correlational research

8 tips for conducting accurate research

1. Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.
2. Keep track of the frequency with which each of the main findings appears.
3. Make a list of your findings from the most common to the least common.
4. Evaluate a list of the strengths, weaknesses, opportunities, and threats that have been identified in a SWOT analysis.
5. Prepare conclusions and recommendations about your study.
6. Act on your strategies
7. Look for gaps in the information, and consider doing additional inquiry if necessary

Literature search on research problem stated

Literature review-

A **literature review** is an overview of the previously published works on a specific topic. The term can refer to a full scholarly paper or a **section** of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

Producing a literature review is often a part of graduate and post-graduate student work, including in the preparation of a thesis, dissertation, or a journal article.

Why write a literature review?

When you write a thesis, dissertation, or research paper, you will have to conduct a literature review to situate your research within existing knowledge. The literature review gives you a chance to:

- Demonstrate your familiarity with the topic and scholarly context
- Develop a theoretical framework and methodology for your research
- Position yourself in relation to other researchers and theorists
- Show how your research addresses a gap or contributes to a debate

You might also have to write a literature review as a stand-alone assignment. In this case, the purpose is to evaluate the current state of research and demonstrate your knowledge of scholarly debates around a topic.

The content will look slightly different in each case, but the process of conducting a literature review follows the same steps.

There are five key steps:

1. **Search** for relevant literature
2. **Evaluate** sources
3. **Identify** themes, debates and gaps
4. **Outline** the structure
5. **Write** your literature review

A good literature review doesn't just summarize sources—it analyses, synthesizes, and critically evaluates to give a clear picture of the state of knowledge on the subject.

What is a research gap?

Let us begin with understanding what a research gap means. When you read papers or books on topics of your interest, you may realize there are some areas that have significant scope for more research but they have not been tapped by other researchers. In other words, no one has picked up or worked on these ideas. A research gap or a literature gap refers to such unexplored or underexplored areas that have scope for further research.

Here are 6 tips to identify research gaps:

1. Look for inspiration in published literature

- Read books and articles on the topics that you like the most. This will not only help you understand the depth of work done by researchers in your field but also provide an opportunity to ask questions that can lead you to a research gap.
- While reading research articles, you can focus on the Introduction section where the authors explain the importance of their research topic and the gaps they have identified and attempted to fill through their research. Also, look at the directions or suggestions for further research that the authors have made as that could be highly inspiring.
- Read meta-analyses and review papers to learn more about the developments and trends in research over the years in the area of your liking. This will help you get

acquainted with the problems that have been researched upon in the past as well as trending queries on those topics that you find interesting.

2. Seek help from your research advisor

- Discuss the issues and problems in your field with your research advisor to generate ideas for research. Articulating your ideas and knowing what others think and are working on may help you identify your study area or even identify mistakes in your approach. If you think a question would be interesting to work on, you can discuss it with your advisor and get their suggestions.

3. Use digital tools to seek out popular topics or most cited research papers

- To familiarize yourself with the trending queries in your field, you can use digital tools as they can save time and help you cast a wider net in your search for a research gap. Websites like [Essential Science Indicator](#) that identify the most cited papers in a field along with the emerging branches, influential contributors, publications, and countries in that field can be immensely useful to know which topics are considered important. You can also use [Google Trends](#) to learn more about the popular questions related to your research area. This will ease your search for an untapped area in your research field.

4. Check the websites of influential journals

- The websites of prominent journals often have a section called 'key concepts' where experts in an area highlight the central ideas in that field. Reading through this section can help you gain a lot of insights and generate new ideas as well. Moreover, you should also look through the reference section of these papers as it can lead you to important resources on the topic.

5. Make a note of your queries

- It is a good practice to note all the questions that cross your mind while reading any published literature. If possible, you should map the question to the resource it is based on. "[Keep track of what the authors told you and the questions that occur to you whenever you read anything - an article, a book, a book chapter, a dissertation, etc.](#)" advises Nadine Anderson, Behavioral Sciences and Women's and Gender Studies Librarian at the University of Michigan. She says that this will also help in

ensuring that there is no unintended plagiarism in your research paper. You can use tables, charts, pictures, or tools to maintain a record. This can help you in the long run when you are developing your idea into a research problem or even when writing your manuscript.

6. Research each question

- Once you have a list of questions that could be explored, you must conduct thorough research on them. What does this mean? Read more about each doubt or query that you have. Find out if other researchers have had similar questions and whether they have found answers to them. This will help you avoid duplication of work.

What is Research problem?

A research problem is a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. In some social science disciplines the research problem is typically posed in the form of a question. A research problem does not state how to do something, offer a vague or broad proposition, or present a value question.

The purpose of a problem statement is to:

Introduce the reader to the importance of the topic being studied. The reader is oriented to the significance of the study and the research questions or hypotheses to follow.

Places the problem into a particular context that defines the parameters of what is to be investigated.

Provides the framework for reporting the results and indicates what is probably necessary to conduct the study and explain how the findings will present this information.

How to identify a research problem?

After choosing a specific topic for your academic paper, you need to state it as a clear research problem that identifies all the issues that you'll address. It's not always simple for

students to formulate it. In some fields, they may end up spending a lot of time thinking, exploring, and studying before getting a clear idea of what research questions to answer.

Some research paper topics are too broad to give a researchable issue. For example, if you decide to study certain social issues, like child poverty, remember that they don't provide any researchable question. These are very broad to address and take a lot of time and resources to become unfeasible so that your study will lack enough focus and depth.

After doing this 3 steps ,we can do our research.

Framing research questions and hypothesis

Research questions-

research question is 'a question that a research project sets out to answer'. Choosing a research question is an essential element of both quantitative and qualitative research. Good research questions seek to improve knowledge on an important topic, and are usually narrow and specific.

How to frame a hypothesis from research question ?

A hypothesis by definition is a proposition or a number of propositions that reflect a prediction. In simpler words, a hypothesis is a statement that assumes a relationship between an independent variable and a dependent variable. In research, hypotheses provide the basis for data collection and data analysis. The data analysis is essentially applications of research tools and techniques to prove or disprove the hypothesis. However, before testing, it is important to frame the hypotheses properly. This sometimes poses a challenge.

Need for framing a hypothesis from research questions

Not all types of research require a hypothesis. The need for framing a hypothesis stems from the research questions and the research methodology. It depends on the research approach, research type, and research method. Framing a hypothesis is essential in cases:

When the research type was descriptive-

Descriptive research is the one that aims to collect information and analyse it statistically to draw conclusions. For example, let a primary study want to investigate the effects of organizational factors on job satisfaction of employees. Moreover, several organizational factors identified in the literature review are: remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and, scope of promotion. The hypothesis, in this case, will test the effect of these factors on job satisfaction of employees.

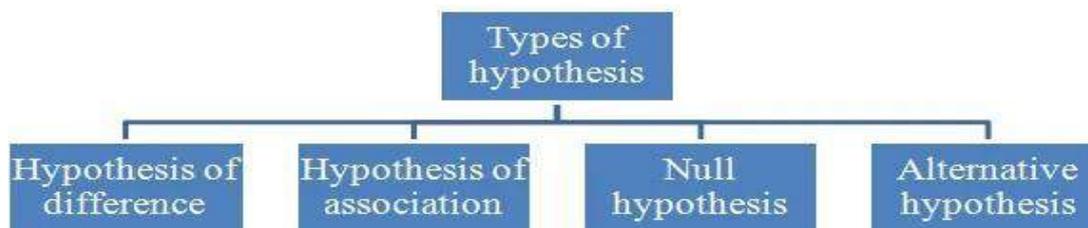
When the research approach is deductive-

A deductive approach of research emphasizes causality and aims to test a theory with the help of a hypothesis. Suppose one wants to examine the Economic theory of export-led growth. This theory states that a country can achieve an accelerated rate of growth by relying on the expansion of exports. There are several factors such as foreign direct investment (FDI), trade openness, exchange rate, bilateral and multilateral trade agreements among others that the literature identifies as related to export expansion. In this case, the hypothesis will be framed to determine the effects of these factors on the growth rate.

When the research method is quantitative-

A quantitative research method is the one that is based on the measurement of variables. It is useful to assess the effect of GDP and the current account deficit of a country on its fiscal deficit. GDP, current account deficit and fiscal deficit all are measured and published in monetary units. The hypothesis, in this case, will be framed to measure the effect of GDP and CAD on the fiscal deficit.

Types of hypothesis -



A hypothesis can be stated in a number of ways. Consider the example research on student performance (grades) in relation to counselling. These are the types of hypotheses that depend on the objective of the study.

- **The hypothesis of difference.** There is a significant difference between the average performance of students who receive counselling and those who do not.
- **The hypothesis of association.** There are equal numbers of students in the classroom who receive counselling and who do not receive counselling.
- **Null hypothesis.** There is no relationship between counselling and the grades received by students in the classroom.
- **Alternative hypothesis.** There is a significant relationship between counselling and the grades received by students in the classroom.

Furthermore, if the research predicts that there is a significant relationship between counselling and student performance. The alternative hypothesis reflects this prediction. The null hypothesis is framed in such a way that it can be refuted to confirm the alternative hypothesis.

Format of a hypothesis

Consider the example of organizational factors and job satisfaction mentioned above.

- Make a flow chart before framing the hypotheses. This is called a conceptual framework and it helps in framing the hypotheses in a systematic way. In the conceptual framework, list the independent variables or the factors on the left-hand side. The dependent variable 'job satisfaction' should be on the right-hand side. Use an arrow in between. The directionality of the arrow should be from the independent variables to the dependent variable.
- Following the conceptual framework, the independent variables should come on the left-hand side of the hypothesis. The dependent variable should be on the right-hand side of the hypothesis.
- Include words like 'impact', 'influence', 'effect', 'relationship' or 'association' within the hypothesis. This is to indicate what tests can be used in testing it.
- Use notation H_0 to denote the null hypothesis.
- Use notation H_A to denote the alternative hypothesis.

Following the above rules, the null and the alternative hypotheses in case of the above example are:

H_0 : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have no effect on the job satisfaction of employees.

H_A : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have a significant effect on the job satisfaction of employees.

Steps for constructing a hypothesis

- The first step before constructing a hypothesis is a thorough review of existing literature on the topic of research.
- After the literature review, identify gaps in the literature. Then narrow down the research problem to fulfill the gap.
- The research problem needs to be stated in terms of research objectives or research questions.
- Following the research question, identify the dependent and the independent variables.
- Frame statements or hypotheses that reflect a prediction and are testable.

- The results of hypothesis testing directly help to answer the research questions and draw conclusions for the study.

Important points

While framing hypotheses, these are the important points one needs to remember.

- The hypothesis should be precise and clear.
- It should be stated in simple terms.
- The hypothesis should propose a relationship between two variables or a set of variables namely dependent and independent variables.
- The scope of the hypothesis should be specific and narrow.
- The hypothesis should conform to the research questions.
- It should be consistent with the findings of the previous researches or facts that are known and established.
- The hypothesis should be testable with primary or secondary data.
- The results of hypothesis testing should address the study's aim and objectives adequately.

Selecting study area and target population

Selecting study area-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work” deally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

Target populations-

Before research can begin the target population must be identified and agreed upon. The target population is the entire population, or group, that a researcher is interested in researching and analysing. A sampling frame is then drawn from this target population. For example, if the research was to identify approximately how many parents read a particular article in their child's school newsletter, the target population would be all parents of children at that school. The target units would then be the individual parents, and the school could provide a list of parent contact details which would serve as a sampling frame.

Identifying and collecting relevant secondary data

Secondary Data- Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

Data classified as secondary for particular research may be said to be primary for another research. This is the case when data is being reused, making it primary data for the first research and secondary data for the second research it is being used for.

Steps of collecting secondary data-

1. **Termine your research question** – As indicated above, knowing exactly what you are looking for
2. **Locating data**– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.
3. **Evaluating relevance of the data** – Considering things like the data's original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. **Assessing credibility of the data** – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.
5. **Analysis** – This will generally involve a range of statistical processes as discussed in Chapter 13.

Survey schedule and questionnaire

- The research process is incomplete without the collection of data, which starts after the identification of the research problems and chalking out research design.
- There are several methods involved in the collection of primary data, like observation, interviews, questionnaires, schedules, etc.
- Both questionnaire and schedule are popularly used methods of collecting data in research surveys.
- There is much resemblance in the nature of these two methods and this fact has made many people to remark that from a practical point of view, the two methods can be taken to be the same.
- But from the technical point of view, there are many differences between the two common methods of data collection.

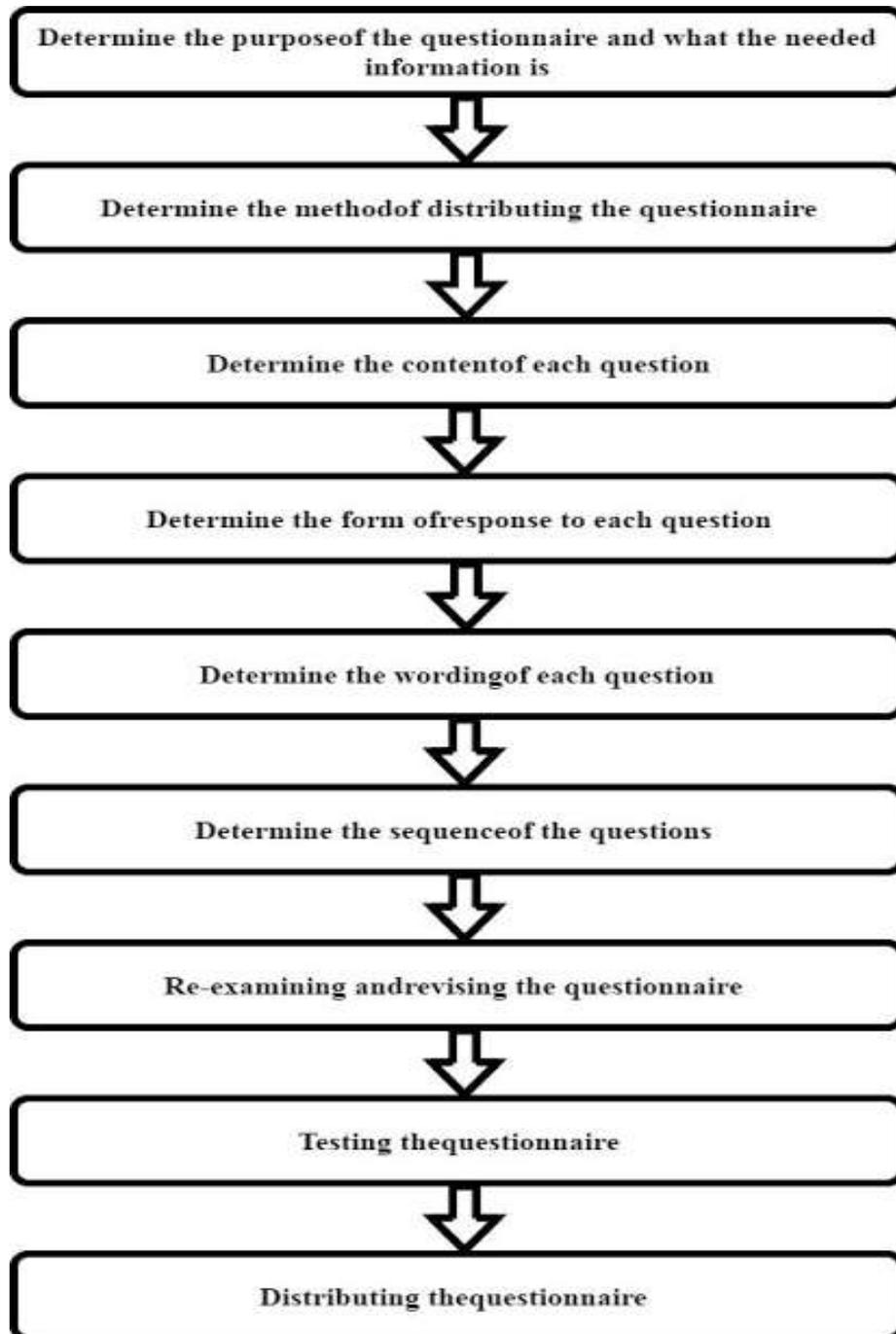
Similarities between survey and questionnaire-

- Both are set of related items having questions relating to a central problem.
- Both use mainly structured questions and these questions are so phased and interlocked that they have a built-in mechanism for testing the reliability and validity of the response.
- In both the same set of questions is administered to all the respondents and comparable results are obtained.
- Both these instruments have to be used with the same general principles of designs and have to take into account the same problems and basic difficulties they have to be limited in length.
- In both, the central problem has to be concentrated upon the following considerations involved in the problem of evolving the questionnaire and a schedule as a unit.
- Drawing the respondent into a situation through awake and interest.
- Proceeding from simple to complex questions.
- No early and sudden request for information of a personal and embracing intimate nature.
- Not asking embarrassing questions without giving the respondent an opportunity to explain himself.
- Moving smoothly from one item to another.
- In both certain types of questions have to be eliminated such as vague and ambiguous questions, emotionally charged questions, loaded and leading questions, questions eliciting no response and questions having a structured response to the queries, violence to the existing facts.
- In both pilot studies and pre-tests are necessary for formulating the instrument and for bringing them to the final form. They have to go through the same stages of development.

Differences between survey schedule and questionnaire -

- The questionnaire refers to a technique of data collection which consists of a series of written questions along with alternative answers.
- The schedule is a formalized set of questions, statements, and spaces for answers, provided to the enumerators who ask questions to the respondents and note down the answers.
- While a questionnaire is filled by the informants themselves, enumerators fill the schedule on behalf of the respondent.

Prepare a schedule-
Prepare a questionnaire-



ISSUES ON FIELD RESEARCH

PILOT STUDY BASED ON QUESTIONNAIRE

Definition: A pilot study is a preliminary small-scale study that researchers conduct in order to help them decide how best to conduct a large-scale research project. Using a pilot study, a researcher can identify or refine a research question, figure out what methods are best for pursuing it, and estimate how much time and resources will be necessary to complete the larger version, among other things.

Process of Piloting a Survey Questionnaire

- **Selecting the pilot sample:** For large or complex surveys, it is a good idea to do a full pilot before starting actual data collection. To do a pilot a researcher need to test all the survey steps from start to finish with a reasonably large sample. The size of the pilot sample depends on how big the actual sample of the researcher is, and how many data collectors the researcher has. For a typical baseline or endline survey a sample of around 30-50 people is usually enough to identify any major bugs in the system.
- **Implementation of all the steps from start to finish:** The researcher will start by training his data collectors, if he has them. Then the researcher will distribute and collect the survey, after which he will enter the completed surveys into the database that he has planned to use and will test the analysis that he has planned to perform.
- **Making improvements:** Assuming that the survey was pretested, piloting will normally identify practical problems with implementation, rather than problems with the survey design. For example, lack of staff training, challenges with the logistics of distributing and collecting the survey, or errors in data entry. These can then be fixed before the researcher do the actual survey.

Advantages of Conducting a Pilot Study:

Pilot studies are useful for a number of reasons, including:

- Identifying or refining a research question or set of questions
- Identifying or refining a hypothesis or set of hypotheses
- Identifying and evaluating a sample population, research field site, or data set
- Testing research instruments like survey questionnaires, interview, discussion guides, or statistical formulas
- Evaluating and deciding upon research methods
- Identifying and resolving as many potential problems or issues as possible
- Estimating the time and costs required for the project
- Gauging whether the research goals and design are realistic
- Producing preliminary results that can help secure funding and other forms of institutional investment

After conducting a pilot study and taking the steps listed above, a researcher will know what to do in order to proceed in a way that will make the study a success.

ETHNOGRAPHIC FIELD DIARY

Ethnographic data is collected in a variety of ways that involve the researcher being embedded in the field in a variety of ways. Ethnographers collect data by observing in the field. This includes both structured and unstructured observations, along with participant observations. In addition, ethnographers engage in formal and informal interviews and focus groups with subjects. Often researchers will engage in a variety of methods for one research project and this data collection will occur over a period of time. An ethnographer may spend days, months or even year in one **field site** to observe an interview research subject. A field site is the location on the environment an ethnographer is studying. It can be virtually any place- a school, workplace, community, home, street and even in the online world. This **triangulation** of ethnographic methods- using a variety of methods in a field site--- help the researcher to gather as much data as possible to identify trend, patterns and nuances of the field they are studying.

As a result of the intensive data collection method that ethnographers engage, researchers often end up with a good deal of data to analyze. It is therefore important for ethnographers to have a plan on exactly they will collect their data before they head into the field.

LONGITUDINAL STUDY

Definition: A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

Working procedure of Longitudinal Study:

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Benefits of Longitudinal Study:

A longitudinal study can provide unique insight that might not be possible any other way. This method allows researchers to look at changes over time. Because of this, longitudinal methods are particularly useful when studying development and lifespan issues. Researchers can look at how certain things may change at different points in life and explore some of the reasons why these developmental shifts take place.¹For example, consider longitudinal studies that looked at how identical twins reared together versus those reared apart differ on a variety of variables. Researchers tracked participants from childhood into adulthood to look at how growing up in a different environment influences things such as personality and achievement. Since the participants share the same genetics, it is assumed that any differences are due to environmental factors. Researchers can then look at what the participants have in common versus where they differ to see which characteristics are more strongly influenced by either genetics or experience.

Drawbacks of Longitudinal Study:

- **Longitudinal Studies Can Be Expensive:** Longitudinal studies require enormous amounts of time and are often quite expensive. Because of this, these studies often have only a small group of subjects, which makes it difficult to apply the results to a larger population.
- **Participants Tend to Drop Out Over Time:** Another problem is that participants sometimes drop out of the study, shrinking the sample size and decreasing the amount of data collected. This tendency is known as selective attrition. Participants might drop out for a number of reasons, like moving away from the area, illness, or simply losing the motivation to participate. In some cases, this can influence the results of the longitudinal study. If the final group no longer reflects the original representative sample, attrition can threaten the validity of the experiment. Validity refers to whether or not a test or experiment accurately measures what it claims to measure. If the final group of participants is not a representative sample, it is difficult to generalize the results to the rest of the population.

CASE STUDY RESEARCH

Definition: Case study research is that in which the subject of the research is studied within its social, political, organizational, or economic context and it is one of the commonest approaches across the social and management sciences.

Many authors cite Yin, who describes case study research as:

" ... an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, location no. 638-650).

In other words, the subject of the research is comprehensively studied as an example of a real live phenomenon, within the context in which it happens.

How & when is the Case Study method used?

According to Yin (2006), case study research is best applied when the research addresses descriptive or explanatory questions: i.e. what happened, how, and why?

It is also good for describing a situation or phenomenon occurring in the present, where in-depth description is useful and where the researcher does not need to manipulate events.

Yin (2003) identifies three types of case studies:

1. Exploratory: the case study is used to define questions and hypotheses – or to test out a research procedure – for a further piece of research, such as a large-scale survey.
2. Descriptive: the case study is used to describe a particular phenomenon within its context. It can be used to expand on a particular theme unearthed by a survey.
3. Explanatory: the case study explores cause-effect relationships, and/or how events happen.

Only the third of these approaches can stand up as a method in its own right, and not as an ancillary to other quantitative approaches such as surveys or field experiments.

Advantages of the Case Study as a Research Method

- a) Case studies are "real" – they offer a chance to get a snapshot of real life: a rich and thick picture. As such, they are most appropriate for dealing with a subject that is context dependent, complex, unusual, or where there is some ambiguity.
- b) In direct contrast to positivist approaches, which seek to generalise, the case study offers particularity: i.e. the opportunity for a holistic approach without the distraction of too many variables (Gummesson, 2007).
- c) While it offers depth and specificity, case study research also offers breadth and diversity in terms of methods of data collection and analytical techniques. For example, one case study can incorporate surveys, interviews, direct observation, and

archival research. This offers the possibility of several different layers of analysis which can reveal several different perspectives, with the added benefit of triangulation of the results.

- d) According to Woodside (2010, pp. 2-3) the usefulness of case study research lies in the fact that it encourages research methods that help measure thinking over an ongoing period, for example by multiple interviews.
- e) It can also be a useful method when the unit of analysis, or the subject under consideration, is a collective entity such as an organisation or a community.

Disadvantages of the Case Study as a Research Method

- a) The most common objection to case study research is that it is insufficiently rigorous. Quite often this criticism relates not to the method as such, but to the way case studies are presented: the author does not leave a clear audit trail detailing his or her research and explaining the conclusions.
- b) Case studies are often seen as a "bolt-on" to a major research project, defining research questions or throwing further light on an issue that has been revealed by a survey. That explanatory research can offer an understanding of a phenomenon is viewed with scepticism by some, on the grounds that a single case study cannot yield a sufficient volume of evidence on which to generalise.

ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

In order to act on the data collection, a researcher will most likely have to engage with his student population and other stakeholders. When approaching students with data collection requests it is important to be aware of certain ethical considerations.

Ethical considerations refer to the ethical practices of how data is collected, stored or shared. These can include securing clear and informed consent, how to safely store data or how to secure permissions to use or share data. Here are some common ethical considerations that a researcher needs to think through before collecting his data:

Informed Consent: Informed consent refers to written consent by a person to participate in any given evaluation activity where private data and information may be collected. A document is typically prepared that outlines the goals of the evaluation, why data is being collected from whom and how, how it will be stored, for how long and who will have access to it. Facilitators or data collectors are required to ensure that participants understand this information and provide informed consent.

Confidentiality and Anonymity: Confidential data refers to information that is connected to a particular individual but kept confidential such as medical or service records. Anonymous data is information that cannot be traced to a particular individual. Both kinds of data may prove useful, but it is important to ensure that participants know if and how the information they provide is either confidential or anonymous.

Clear Communication and Data Sharing: While it is important to have clear processes for collecting data, it is equally important to have clear processes for sharing data. This is especially true when individual data is private and sensitive such as mental health or

addiction related information. It is useful to let participants know that any information gathered is aggregated in the analysis process as a way of ensuring privacy of individual data.

PARTICIPATORY RURAL APPRAISAL

Definition

Participatory rural appraisal (PRA) Or participatory learning and action (PLA) is the fieldworkers use of participatory approach. The PRA continues to evolve so fast that no definitions can be final and has to be updated several times. PRA is defined and updated several times by Prof. Robert Chambers. PRA has been described as

and analyse the realities of their lives and condition, and themselves to plan, monitor and evaluate their actions (Chambers, 1994).

empower people to share, analyse and enhance their knowledge of life and conditions, and to plan, act, monitor, evaluate and reflect (Chambers, 2004).

PRA is a flexible, low cost and time saving set of approaches and methods used to enable workers to collect and analyze information in terms of past, present and future situations to understand the rural populace and the condition that exists in rural areas which would provide a thorough and comprehensive idea regarding problems, potentials, resources and solutions to formulate realistic development practitioners to achieve the desired goals within specific time (Chambers 1992). Participatory approaches like PRA are now becoming a basic approach in rural development and a wide range of examples can be found in the literature for natural resources and communally owned land: resource economics (Pretty and Scoones 1989), resource planning (Scoones and McCracken 1989), and community forestry (Molnar 1989 and Messerschmidt 1991). The use of the PRA also brought forth the adaptability of PRA tools and their use in the research process (Szymanski, et.al 1997). Locally, participatory processes create the possibility for creating linkages between survival strategies, knowledge systems, knowledge network and sustainable livelihoods (Gupta, 1997).

The PLA/PRA approach is used with the following assumptions:

1. Rural communities form active foundation for rural development
2. Communities need committed local leaders to stir up their development
3. Communities have knowledge and information but it needs to be organized
4. Communities have resources but they need to be mobilized. They can introduce projects, acting primarily on their own resources.
5. Community organizations are among the many, which are under utilized resources available for development efforts.
6. External units such as Government technical experts and extension workers, NGOs, and international organizations often can provide substantial technical, financial or managerial assistance that is critical to rural communities.

7. Thus, PLA/PRA brings together on the one hand, development needs defined by the community members and on the other, skills of Government, donor agencies and NGOs. It integrates traditional knowledge systems and external technical knowledge in the development process.

PRA helps communities to:

- Mobilize their human and natural resources
- Define problems
- Consider previous successes and failures
 - Evaluate priorities and opportunities
 - Prepare a systematic and site specific plan of action (CPA)

The objectives of the PRA

The content included in the PRA are simple and do not require high caliber or mathematical thinking. But require minds which are prepared to accept a new way of learning, a new of doing things and that we have limited knowledge of something. The ultimate aim of PLA/PRA workshop is:

1. To build up a permanent “people first” attitudes in the minds of the participants. To show that “people are capable agents to change their own lives” but require limited out side assistance.
2. To establish a notion of “respect” to the people’s knowledge in the life of professionals and their institutions.
3. To provide simple analytical tools to analyze rural situations.
4. To show some of the analytical tools to the community in the field setting and understand their suitability to farmer situation.
5. To enhance participant’s ability to plan with the community.

PRA TECHNIQUES AND METHODS

The most common methods are the following:

Diagramming, Mapping and Modeling: - transects - maps (resource, social, farm)

venn diagrams - seasonally analysis - historical analysis (time lines, trend lines, activity profiles)

Ranking and scoring - pair wise ranking - matrix ranking - matrix scoring - well-being analysis and wealth ranking - proportional piling –

pie charts (injera charts) Problem analysis - identification and specification - causal chaining - prioritization **Maps and Models** – Diagrams

APPLICATION AND USES OF PRA

The PRA is not purely a new method, but is an adoption and development of various other methods/approaches that were developed before it, such as:

1. **Andragogy of Education**

A well-known expert in education from Brazil, Paulo Freire (1971), gave plenty of critics on the education system that was not participative and did not empower the students. He criticized the conventional education and counseling ways—by referring to it as domestication—as a form of imperialism in the education system. This philosophy of participative education in the system of education and counseling is adopted by the PRA method.

2. **The Field of Research and Science**

According to Robert Chambers (1992) there are five main trends that decorate the principle method of PRA:

a) **Participatory Action Research**, born from the suggestion of Paulo Freire, stating that the poor can and have the possibility to analyze their own facts and conditions. Recognition of the ability of the village community in analyzing their problems is adopted into PRA;

b) **Agro-ecosystem Analysis**, is a combination between system analysis with ownership system by analyzing space, time and the cause-effect relation, relative values and decision making. The methods that were adopted into PRA from this method are the transect technique (locational trace), mapping, seasonal calendar, Venn diagram (inter-party relations) and ranking matrix;

c) **Applied Anthropology**, created as an effect of the critics to the science of pure anthropology that emphasize more on the comprehension of the community. Applied Anthropology is intended to judge the ability and validity of village community knowledge and to differ between the soul-frame of the outsider with the insider. What PRA adopts from applied anthropology is that studying outside in the fields is a flexible art and not a science that is rigid, the difference between emic (community norms) and etic (scientific norms), the validity of indigenous technical knowledge of the village community;

d) **Field Research on Farming System**, the focus of attention is in field research participation, because the farmers as the main actors in agriculture are very experienced people that have their own ways to maintain the life of their agricultural system. This method contributes to PRA its yard/garden sketching technique;

e) **Rapid Rural Appraisal/PRA**, developed because of a number of reasons. The first being the increase of disappointment against anti-poverty bias as the result of “village development tourism”. The bias referred to are: spatial bias (people only come to visit villages that are still close to the city, the main roads and village center, and ignore the

borderline villages); project bias (only provide attention and support for villages that are in a project's area); personnel bias (favors men better than women, the elite than the poor, the service users than the non-users, etc.); seasonal bias (preference to visit the villages during the dry season or during harvest time compared to the wet season or time of famine); diplomatic bias (people from the outside do not wish to meet poor people or see appalling conditions that can touch their hearts). All those biases can combine to conceal the worst poverty of all. The second reason is the disappointment of conventional survey methods. For years and in many places, experience has shown that surveys using questionnaire tend to be over-rated, boring and confusing. The data received are often inaccurate. It also takes a long time to report, is boring and difficult to use, which in the end is often abandoned. The third reason is there has been efforts to find a new and better method that is more effective, by empowering the indigenous technical knowledge of the village community as a source of information to analyze and use for the experts from outside.

FOCUS GROUP DISCUSSION

Definition

A focus group discussion involves **gathering people from similar backgrounds or experiences** together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group.

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.
- Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not dominate it, and so that those participants who tend not to be highly verbal are able to share their views.

- Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES

Who are stakeholders?

Stakeholders are persons, groups or institutions with interest in the project or programme. Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively. Secondary stakeholders are the intermediaries in the aid delivery process. This definition of stakeholder includes both winners and losers and those involved or excluded from decision making process. Key stakeholders are those, who can significantly influence or are important to the success of the project (ODA, 1995). This wide definition clearly includes ourselves (researchers) and farmers along with other disciplinary categories such as policy makers, extension officers, relevant government & nongovernmental organisations.

The word 'stakeholder' was first recorded in 1708 as 'a person who holds the stake or stakes in a bet' (Ramirez, 2001). In business context, a stakeholder as defined by Freeman (1984) is 'any group or individual who can affect or is affected by the achievement of a corporation's purpose'. However, Rölting and Wagemakers (1998), in the context of natural resource management defined stakeholders as 'natural resource users and managers'.

According to ODA (1995) and Allen and Kilvington (2001), there are two types of stakeholders.

i) Primary stakeholders: They are those who are (will be) ultimately affected either positively (e.g., beneficiaries) or negatively (e.g., those involuntarily resettled). They are immediate communities of interest.

ii) Secondary stakeholders: They are the intermediaries in the aid delivery process. They may include government agencies and other institutional bodies. Often these groups do not consider themselves as stakeholders because they feel they own the process.

There is another party called the *Tertiary Stakeholders*. This group consists of those individuals or organizations that do not have any particular 'stake' in the initiative. However, their activities affect the project's functioning and outcome.

What Is Stakeholder Analysis?

A "stakeholder" can be defined as: Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

According to ODA (1995), stakeholder analysis is a tool by which the key stakeholders of a project are identified, their interest in the project is assessed and the ways in which are interest affects project riskiness and viabilities are judged.

Although stakeholder analysis finds its origin to business and managerial science, it is currently used in fields ranging from political science to policy development and international relations (Chevalier, 2001). The concept and related methodology have made significant

inroads to poverty reduction studies and applied research pertaining to issues of sustainable livelihood, community based natural resource and conflict management (Ramirez, 1999).

Applications of Stake holder Analysis (SA):

Although SA can be usefully applied to a wide range of policy and management contexts. It is more relevant in complex situations where there are compatibility problems between objectives and stake holders. It is suggested that SA is particularly relevant to natural resource issues where they are characterized by:

- Cross cutting systems and stake holder interests
- Multiple users and users of the resources
- Multiple objectives and concerns
- Temporal trade-offs
- Poverty and under representation
- Market failure

Steps in Stakeholder Analysis:

There are eight major steps in the process:

1. Planning the process: The first step in conducting a stakeholder analysis is to define the purpose of the analysis, identify the potential users of the information, and devise a plan for using the information. A discussion of these issues should be led by the “sponsor,” or initiator, of the stakeholder analysis.

2. Selecting and defining a policy: For a stakeholder analysis to be useful, it must be focused on a specific policy or issue. Again, policy is used in this document to refer to any national, regional, local, or institutional project, program, law, regulation, or rule. In most cases, the sponsor of the stakeholder analysis will have identified a policy, but it is important to ensure that the policy in question is an appropriate topic for a stakeholder analysis before the process begins.

3. Identifying key stakeholders: Identifying the key stakeholders is extremely important to the success of the analysis. Based on the resources available, the working group should decide on the maximum number of stakeholders to be interviewed.

4. Adapting the tools: Generally, very little secondary information is available on stakeholders. As a result, the working group should plan to interview the priority stakeholders identified to gain accurate information on their positions, interests, and ability to affect the process.

5. Collecting and recording the information: Before beginning the interviews, the working group should gather and review secondary information on the priority stakeholders. It should include any statements regarding the stakeholders’ positions on the policy, any goals or objectives of the organizations the stakeholders represent.

6. Filling in the stakeholder table: This step of the process involves taking detailed and often lengthy answers from the interviews and arranging them into a more concise and systematized format.

7. Analyzing the stakeholder table: Once the stakeholder table is complete, the information needs to be "analysed." Such an analysis should focus on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests, positions, and possible allies regarding the policy in question.

8. Using the information: Using the information generated by the preceding analysis is an integral part of the stakeholder analysis process.

Benefits/Advantages of stakeholder analysis:

- Identity stakeholders with conflicting interest and provide opportunity for finely adoption of conflict resolution strategies.
- The opinions and views of powerful and influential stakeholders serve as valuable inputs.
- The support and co-ordination of stakeholders are ensured.
- Ensure resource mobilization (both in terms of financial and non-financial).
- Help to identify relations between stakeholders who can be built upon and may enable 'Coalition' of project sponsorship, our-ship and co-operation.
- Identify stakeholders who are sources of risk as threat to the project.
- Identify stakeholders who need empowerment through capacity building or institutional building.
- Help to assess the appropriate type of participation by different stakeholders at successive stage of the project cycle.
- Help to avoid allocation of time and resources to unnecessary individuals or organizations.

Limitations of SA:

1. Though a powerful tool for problem analysis and illuminating the interests of underrepresented, it cannot in itself provide answers to problems.
2. SA, mirrors the groupings and interest of society and in itself does not try to make changes.
3. The process of analysis cannot be extended for examining the role of very large number of stake holders.
4. Cannot be tried to quantify stake holders' likely gains and losses, this is inherently qualitative tool and can best be employed as an illustrative aid to decision making.

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OR ANY SECTOR

A SWOT analysis makes it possible to assess the various strengths, weaknesses, opportunities and threats (SWOTs) within an organization or within the agricultural extension system as a whole. This factsheet examines the four elements of SWOT and the process of conducting an analysis. It provides tips for conducting the analysis and a ready-to-use SWOT analysis template. The factsheet concludes by looking at scenarios when a SWOT analysis is most appropriate, as well as its advantages and disadvantages.

What is SWOT analysis?

SWOT is an acronym for Strengths, Weaknesses, Opportunities, Threats. Occasionally, it may also be found as a 'WOTS up' analysis or the TOWS analysis. The technique is credited to Albert Humphrey who led a research project at Stanford University in the 1960s and 1970s using data from leading companies involved in long range planning processes.

A SWOT analysis is a planning tool used to understand key factors - strengths, weaknesses, opportunities, and threats - involved in a project or in an organisation. It involves stating the objective of the organisation or project and identifying the internal and external factors that are either supportive or unfavourable to achieving that objective. SWOT is often used as part of a strategic or planning process, but can be applied to help understand an organisation or a situation, and also for decision-making for many different scenarios.

The SWOT framework:

A SWOT analysis process generates information that is helpful in matching an organisation or group's goals, programs, and capacities to the environment in which it operates. The 'SWOT' itself is only a data capture exercise - the analysis follows later.

Strengths: positive tangible and intangible attributes, internal to an organisation and within the organisation's control.

Weaknesses: internal factors within an organisation's control that detract from the organisation's ability to attain the desired goal. Which areas might the organisation improve?

Opportunities: external attractive factors that represent the reason for an organisation to exist and develop. What opportunities exist in the environment, which will propel the organisation? Identify them by their 'time frames'.

Threats: external factors beyond the organisation's control which could place the organisation mission or operation at risk. The organisation may benefit by having contingency plans to address them if they should occur. Classify them by their severity and probability of occurrence.

The SWOT process:

Doing a SWOT analysis can be very straight forward, but its strengths lie in its flexibility and experienced application.

- Decide how the information is to be collected and by whom (often a team approach is much more powerful than one person's view).
- Identify appropriate sources of information.

- Gather the information - it's useful to use a template as the basis for exploring the factors and recording the information. See our practical and ready-to-use template below.
- Plot the findings.
- Identify the most important issues.
- Identify strategic options.
- Write a discussion document.
- Disseminate and discuss the findings.
- Decide which activities are a priority in the context of the organisation's goals and values – a possible action plan framework appears below.

The SWOT analysis tips:

Some useful tips for carrying out a SWOT analysis:

1. Collaborate - an analysis that involves multiple perspectives will deliver a better outcome.
2. Use expertise and resources that are already available within the organisation.
3. Use SWOT analysis in conjunction with other techniques, such as PESTLE analysis.
4. Incorporate the analysis into an ongoing process for monitoring changes in the business environment.
5. Try not to get bogged down collecting vast amounts of detailed information without analysing and understanding your findings appropriately.
6. Don't jump to conclusions about the future based on the past or present.

When to use a SWOT analysis:

A SWOT analysis can be used for:

- Workshop sessions.
- Generating ideas and solutions.
- Problem solving.
- Planning.
- Strategic planning (with PESTLE).
- Product evaluation.
- Competitor evaluation (with Porter's five forces).
- Personal development planning.
- Decision making (with Lewin's force field analysis).

For example, using SWOT in a team meeting might include the following steps:

- Invite contributors to participate in the SWOT process.
- Explain the process and establish ground rules.
- Identify strengths.
- Identify weaknesses.
- Identify or list the opportunities and threats – this may well have been identified from a PESTLE analysis previously.
- Establish priorities – from your mission, vision and values work.
- Question each list.

Advantages and Disadvantages of using SWOT analysis:

There are a number of advantages and disadvantages of using the SWOT approach to analysis. Advantages include:

- ❖ It's a simple four box framework.
- ❖ It facilitates an understanding of the strengths and weaknesses of the organisation.
- ❖ It encourages the development of strategic thinking.
- ❖ It enables senior managers to focus on strengths and build opportunities.
- ❖ It can enable an organisation to anticipate future business threats and take action to avoid or minimise their impact.
- ❖ It can enable an organisation to spot business opportunities and exploit them fully. It's flexible.

Disadvantages include:

- ❖ Some SWOT analysis users oversimplify the amount of data used for decisions – it's easy to use insufficient data.
- ❖ The risk of capturing too much data may lead to 'paralysis by analysis'.
- ❖ The data used may be based on assumptions that later prove to be unfounded.
- ❖ Access to quality internal data sources can be time consuming and politically difficult (especially in more complex organisations – parent company, etc).
- ❖ It lacks detailed structure, so key elements may get missed.
- ❖ The pace of change makes it increasingly difficult to anticipate developments that may affect an organisation in the future.
- ❖ To be effective, the process needs to be repeated on a regular basis.

DEFINITION OF AGE SEX PYRAMID

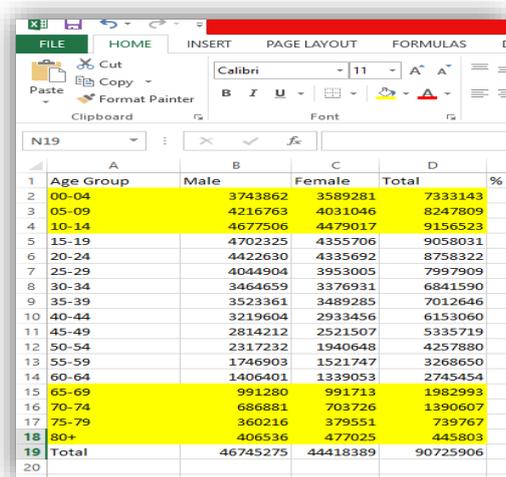
A population **pyramid** or " **age-sex pyramid** " is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically forms the shape of a pyramid when the population is growing.

HOW TO CREATE AGE SEX PYRAMID

STEPS –

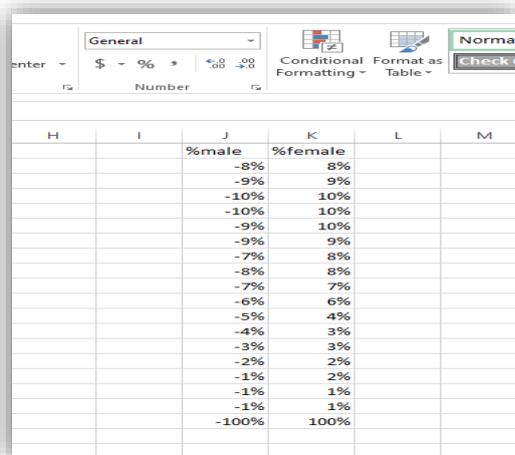
1 . First add the data on excel sheet

2.calculate the % of the male and female population from the data



The screenshot shows an Excel spreadsheet with the following data:

Age Group	Male	Female	Total	% f
00-04	3743862	3589281	7333143	
05-09	4216763	4031046	8247809	
10-14	4677506	4479017	9156523	
15-19	4702325	4355706	9058031	
20-24	4422630	4335692	8758322	
25-29	4044904	3953005	7997909	
30-34	3464659	3376931	6841590	
35-39	3523361	3489285	7012646	
40-44	3219604	2933456	6153060	
45-49	2814212	2521507	5335719	
50-54	2317232	1940648	4257880	
55-59	1746903	1521747	3268650	
60-64	1406401	1339053	2745454	
65-69	991280	991713	1982993	
70-74	686881	703726	1390607	
75-79	360216	379551	739767	
80+	406536	477025	445803	
Total	46745275	44418389	90725906	



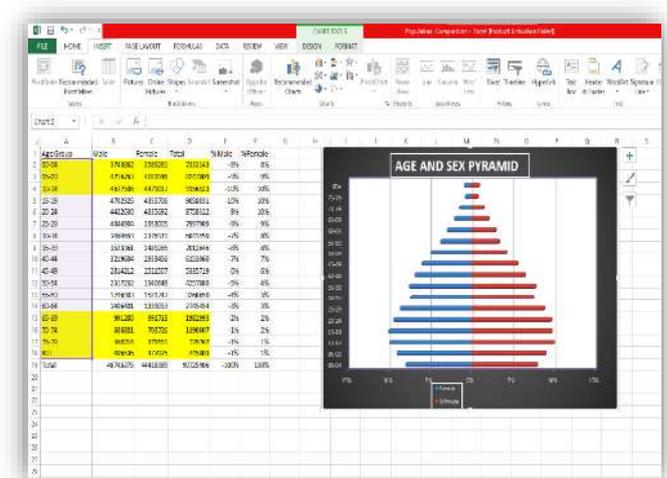
The screenshot shows an Excel spreadsheet with the following data:

	%male	%female
	-8%	8%
	-9%	9%
	-10%	10%
	-10%	10%
	-9%	10%
	-9%	9%
	-7%	8%
	-8%	8%
	-7%	7%
	-6%	6%
	-5%	4%
	-4%	3%
	-3%	3%
	-2%	2%
	-1%	2%
	-1%	1%
	-1%	1%
	-100%	100%

After Calculating the % of the male and female population from the data select the age group with both male and female % population

Age Group	Male	Female	Total	% Male	%Female	%male	%female
00-04	3743862	3589281	7333143	-8%	8%	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%	-3%	3%
65-69	991280	991713	1982993	-2%	2%	-2%	2%
70-74	686881	703726	1390607	-1%	2%	-1%	2%
75-79	360216	379551	739767	-1%	1%	-1%	1%
80+	406536	470225	876761	-1%	1%	-1%	1%
Total	46745275	44418389	90725906	-100%	100%	-100%	100%

Then go to insert select a suitable bar



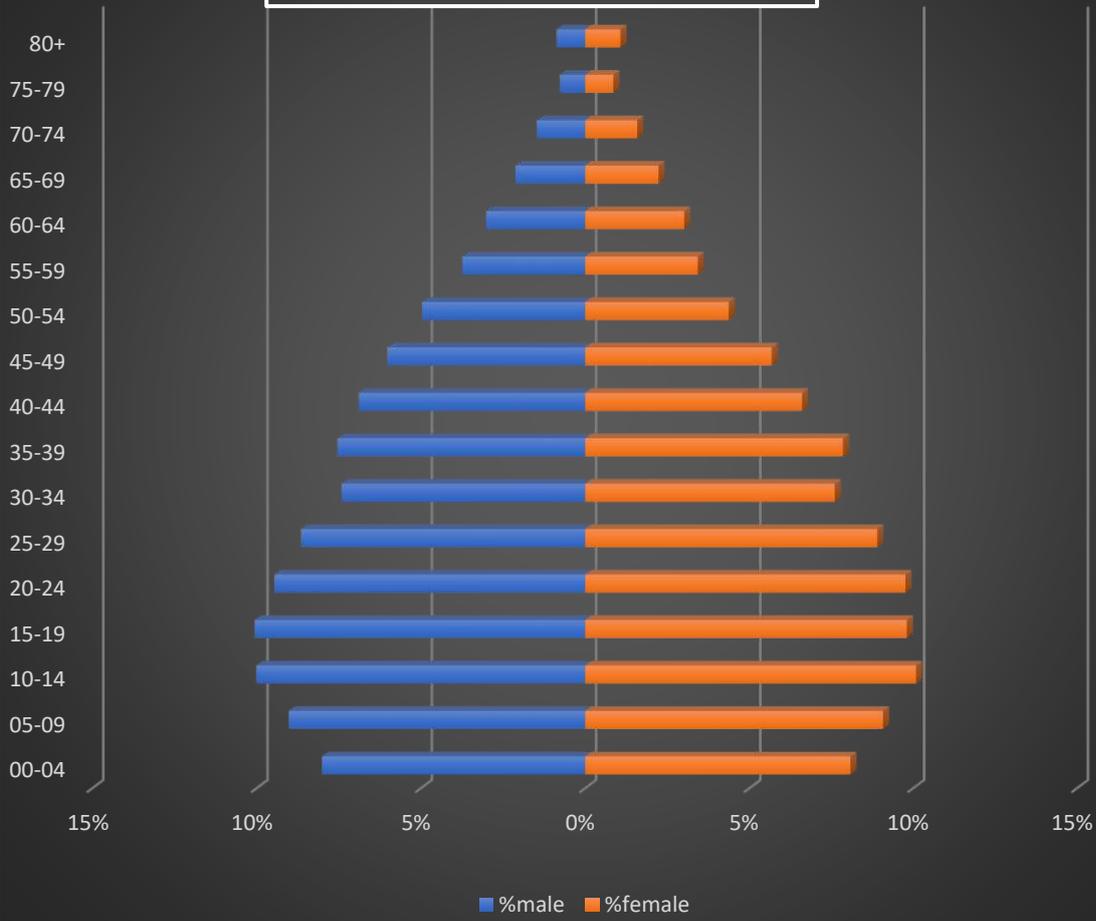
1. After your age and sex pyramid was appear thn you have to remove [-] Portion from the horizontal plane --- right click on it ----then format axis.



Then this type of tool box was open > go to number> click on customs

1. than this type of tool box was open > go to number> click on customs

AGE AND SEX PYRAMID



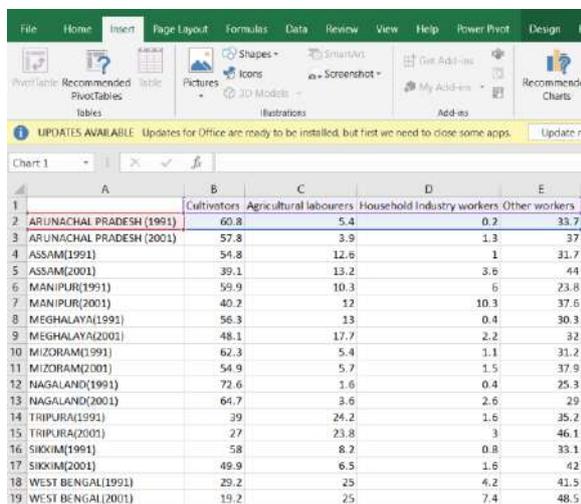
Occupational Structure

What is Occupational Structure?

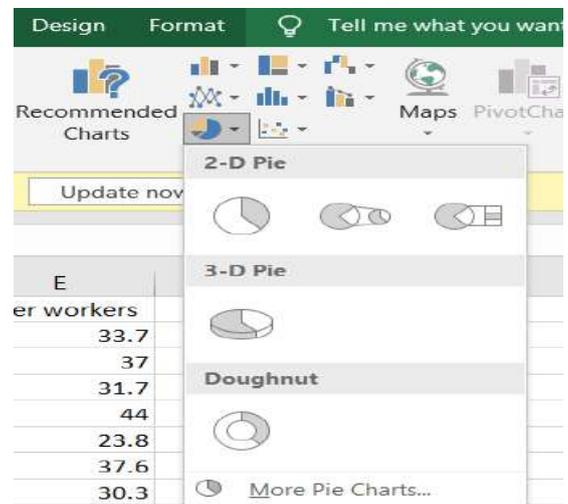
The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a country who are employed in different sectors like agriculture, manufacturing and transport, among many others constitute the occupational structure of a nation.

Steps for occupational structure:

1. At first add the data on excel sheet.
2. Now select the data according to your choice → go to Insert → select recommended charts and click 3a-D Pie → ok.

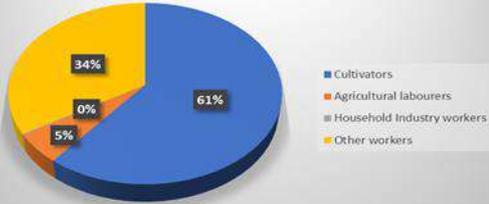


	A	B	C	D	E
1		Cultivators	Agricultural labourers	Household Industry workers	Other workers
2	ARUNACHAL PRADESH (1991)	60.8	5.4	0.2	33.7
3	ARUNACHAL PRADESH (2001)	57.8	3.9	1.3	37
4	ASSAM(1991)	54.8	12.6	1	31.7
5	ASSAM(2001)	39.1	13.2	3.6	44
6	MANIPUR(1991)	59.9	10.3	6	23.8
7	MANIPUR(2001)	40.2	12	10.3	37.6
8	MEGHALAYA(1991)	56.3	13	0.4	30.3
9	MEGHALAYA(2001)	48.1	17.7	2.2	32
10	MIZORAM(1991)	62.3	5.4	1.1	31.2
11	MIZORAM(2001)	54.9	5.7	1.5	37.9
12	NAGALAND(1991)	72.6	1.6	0.4	25.3
13	NAGALAND(2001)	64.7	3.6	2.6	29
14	TRIPURA(1991)	39	24.2	1.6	35.2
15	TRIPURA(2001)	27	23.8	3	46.1
16	SIKKIM(1991)	58	8.2	0.8	33.1
17	SIKKIM(2001)	49.9	6.5	1.6	42
18	WEST BENGAL(1991)	29.2	25	4.2	41.5
19	WEST BENGAL(2001)	19.2	25	7.4	48.5

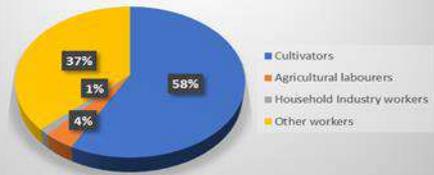


3. After that select the pie diagram → then copy and paste the diagram and merge → save as image → ok.

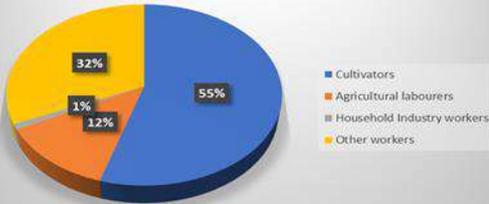
ARUNACHAL PRADESH (1991)



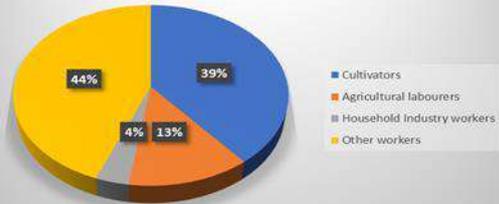
ARUNACHAL PRADESH (2001)



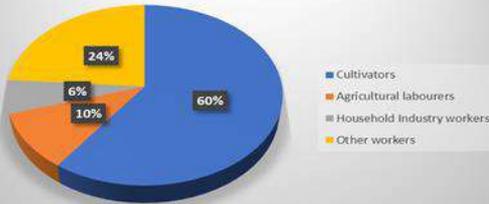
ASSAM(1991)



ASSAM(2001)



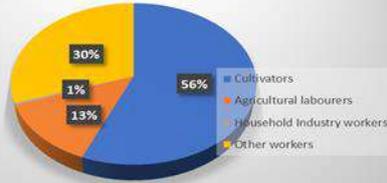
MANIPUR(1991)



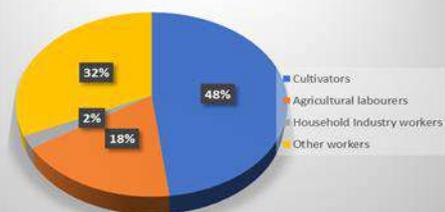
MANIPUR(2001)

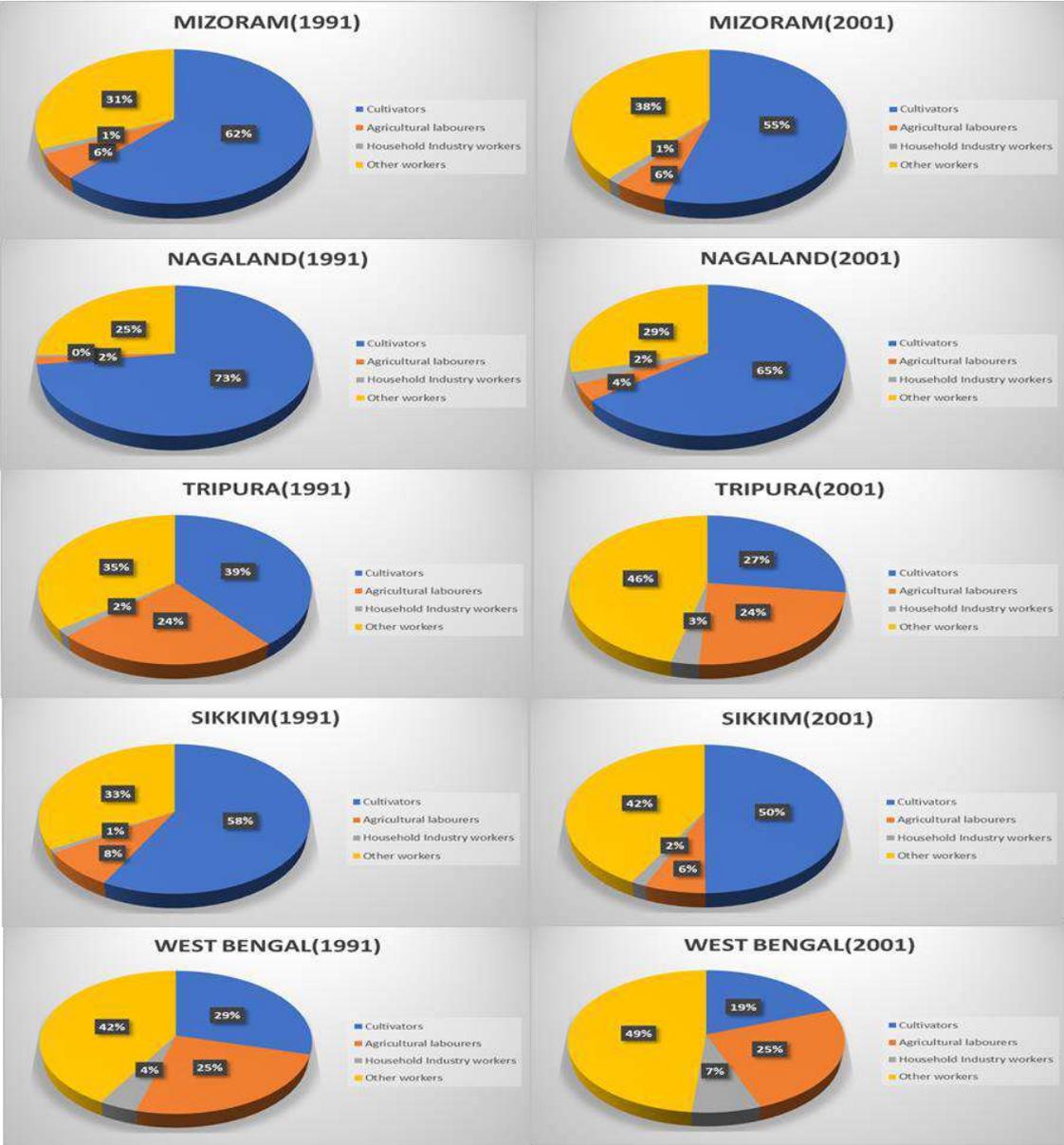


MEGHALAYA(1991)



MEGHALAYA(2001)





MIGRATION

Defination

Migration is the progress of people from one place to another, to establish their permanent or semi-permanent residence at the destination. Immigration is an essential component of change, [structure](#), and population growth, as are birth rates and mortality.

There are attraction factors and pushing factors in one place, which influence a person's decision to move. The first are those that attract people to stay, such as low crime rates, pleasant weather, political stability, and excellent employment opportunities. Push factors encourage people to leave the place, such as poverty, war, and floods. [Migration] is usually voluntary, but there are many specific reasons why a person can do it. Sometimes it is forced. Immigration has been a widespread phenomenon throughout the history of humanity; However, nomadic movements are non-migratory, since their purpose is not to settle permanently or semi-permanently in one place. Nor are tourist trips, pilgrimages, and other actions that do not have this end.

Causes

The causes vary, from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area. The roots of [migration] are the following:

Economic Seek employment, start or continue a career, in particular, take advantage of the economic benefits of a specific country, and so on.

Social stay close or live with the family, seek a better quality of lifestyle, and so on.

Policies from persecutions, wars, and other types of problems or political conflicts that put lives at risk.

Cultural prove the quality of [education](#), seek religious affinity or tolerance, taste for the culture of the country, and so on.

Environmental Escape from natural disasters, find a place with a more pleasant climate, and so on.

TYPES OF MIGRATION

1. Internal migration :

Internal migration is a migration that takes place within the borders of a country or territory;

2. External or internationale migration :

migration is international when it refers to changes in habitual residence between countries ;

3. "lifetime" migration:

The "lifetime" migration is defined by relating the place of birth and the place of residence to a reference date. The migrant "life-time" is any individual who resides in an administrative entity other than his or her place of birth.

4. Migratoire flows :

Migration flows refer to movements (in and out) of population (nationals and foreigners) that occur at the borders of a given country ;

5. Stock of migrants :

Migrant stocks are referred to as the number of migrants (immigrants and emigrants) residing in a country with a certain length of stay, irrespective of the socioeconomic characteristics (migrant workers, refugees, students, etc.) of migrants ;

6. Diaspora :

A diaspora is defined both as the dispersion of a people in foreign countries and the formation of a community of that people in those countries ;

7. clandestine/irregular migration :

There is "clandestine migration" when an foreigner enters a country without respecting the entry conditions or has entered illegally, remains there beyond the time allowed by law.

LAND USE AND LAND COVER MAPS

The terms land use and land cover are often used interchangeably, but each term has its own unique meaning. Land cover refers to the surface cover on the ground like vegetation, urban infrastructure, water, bare soil etc. Identification of land cover establishes the baseline information for activities like thematic mapping and change detection analysis. Land use refers to the purpose the land serves, for example, recreation, wildlife habitat, or agriculture.

When used together with the phrase Land Use / Land Cover (LULC) generally refers to the categorization or classification of human activities and natural elements on the landscape within a specific time frame based on established scientific and statistical methods of analysis of appropriate source materials. Land cover is the physical material at the surface of the earth. Land use is the description of how people utilize the land for the socio-economic activities.

Reason to use Land use and Land cover maps :-

- LULC maps play a significant and prime role in **planning, management and monitoring programmes** at local, regional and national levels. This type of information, on one hand, provides a better understanding of **land utilization aspects** and on the other hand, it plays an important role in **the formation of policies and programme required for development planning**.
- For ensuring sustainable development, it is necessary to **monitor the on going process on land use/land cover** pattern over a period of time.
- **In order to achieve sustainable urban development** and to **check the haphazard development** of towns and cities, it is necessary that authorities associated with the urban development generate such planning models so that every bit of available land can be used in most rational and optimal way.
- LULC maps also help us to **study the changes** that are happening in our ecosystem and environment and **we can make policies and launch programmes to save our environment**.

LULC classification :-

LULC classification is one of the most widely used applications in remote sensing. The most commonly used approaches include :

Unsupervised classification, Supervised classification, Image segmentation, NDVI

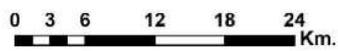
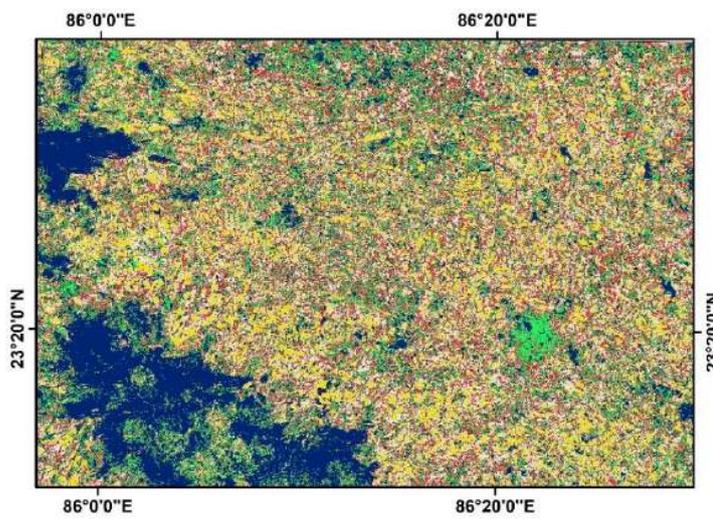
Applications of LULC maps :-

- Natural resource management
- Wildlife habitat protection
- Baseline mapping for GIS input
- Urban expansion / encroachment
- Routing and logistics planning for seismic / exploration/resource extraction activities
- Damage delineation (tornadoes, flooding, volcanic, seismic, fire)
- Legal boundaries for tax and property evaluation. Target detection - identification of landing strips, roads, clearings, bridges, land/water interface.

Steps to create Land use and Land cover Maps :-

Data downloading → Downloading vector data → Downloading ESA Global land cover dataset → Data pre-processing → loading vector data into QGIS → Extracting shape file for chosen area → Adding ESA land cover data to QGIS → clipping ESA Global land cover dataset → Data preparation → Install SCP Plugin in QGIS → QGIS Install Plugin Window → SCP Dock → Import Data → Select Directory SCP Plugin → Creating a Bandset → SCP Bandset Page → SCP Plugin Bandset window with the single band list loaded → Pixel information for each band → Area image before changing band rendering → Create training input → Create classes → Change Band Rendering → Create ROIs → Assess ROIs → Spectral Signature Plot → Run classification → Ground cover classification → SCP land cover change outputs → Layer Properties, Symbology → Land cover change output map

Preparation of a simple landuse map



Legend

Landuse categories

-  Reservoir
-  Vegetation
-  Settlement
-  Marshy land
-  Agricultural land

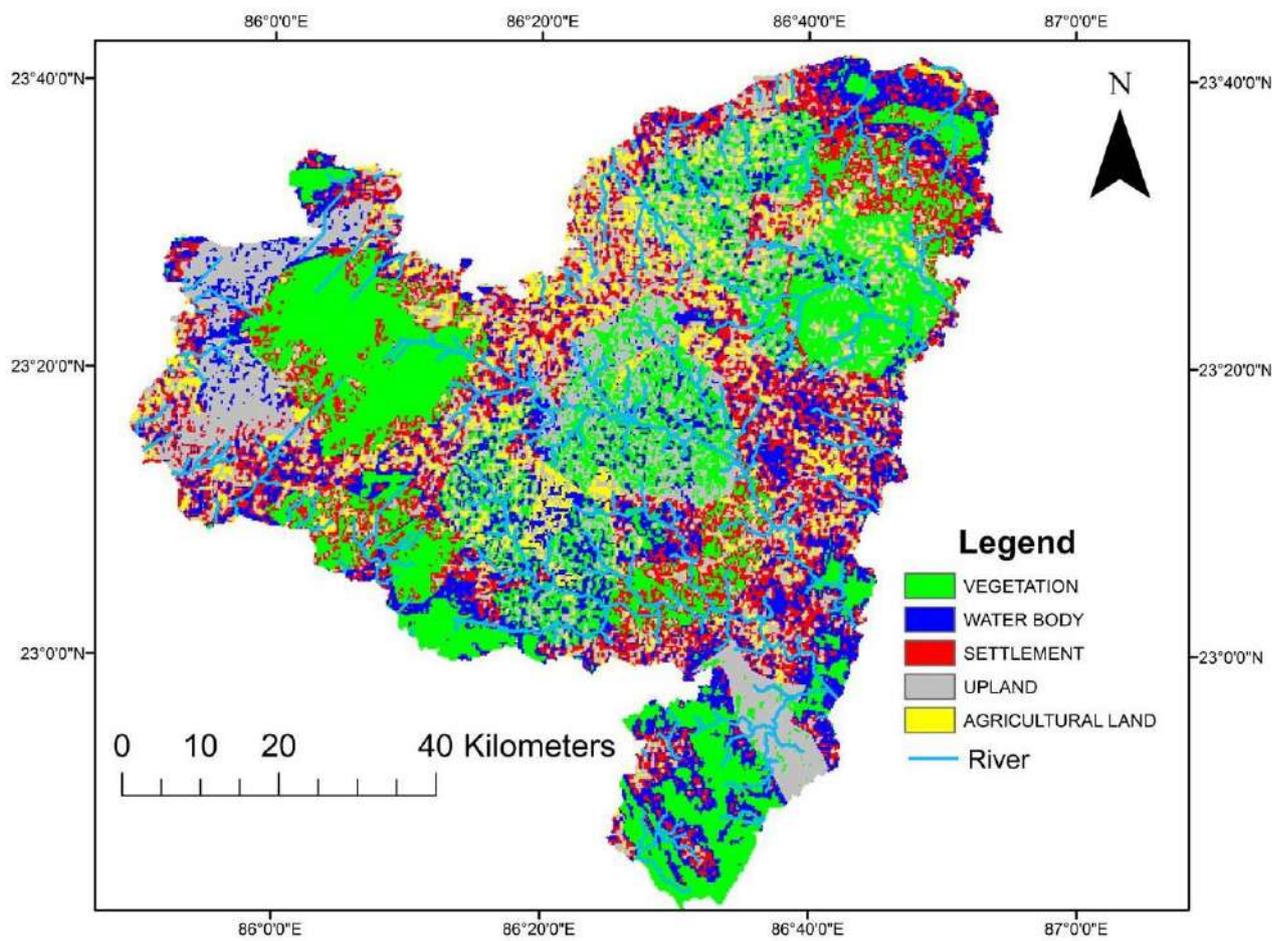
Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation :-

Here in this land use map, there is a reservoir in the north-east side of the area, which is indicated by blue. We can notice, most of this area is covered by agricultural land, which is highlighted by yellow. There are some vegetation in this area which is covered with green. In this area we can see settlement with medium density as red colour. There are marshy land which is noticed very often and this is noticed as grey colour.

We can get a land use and land cover map of Purulia district.

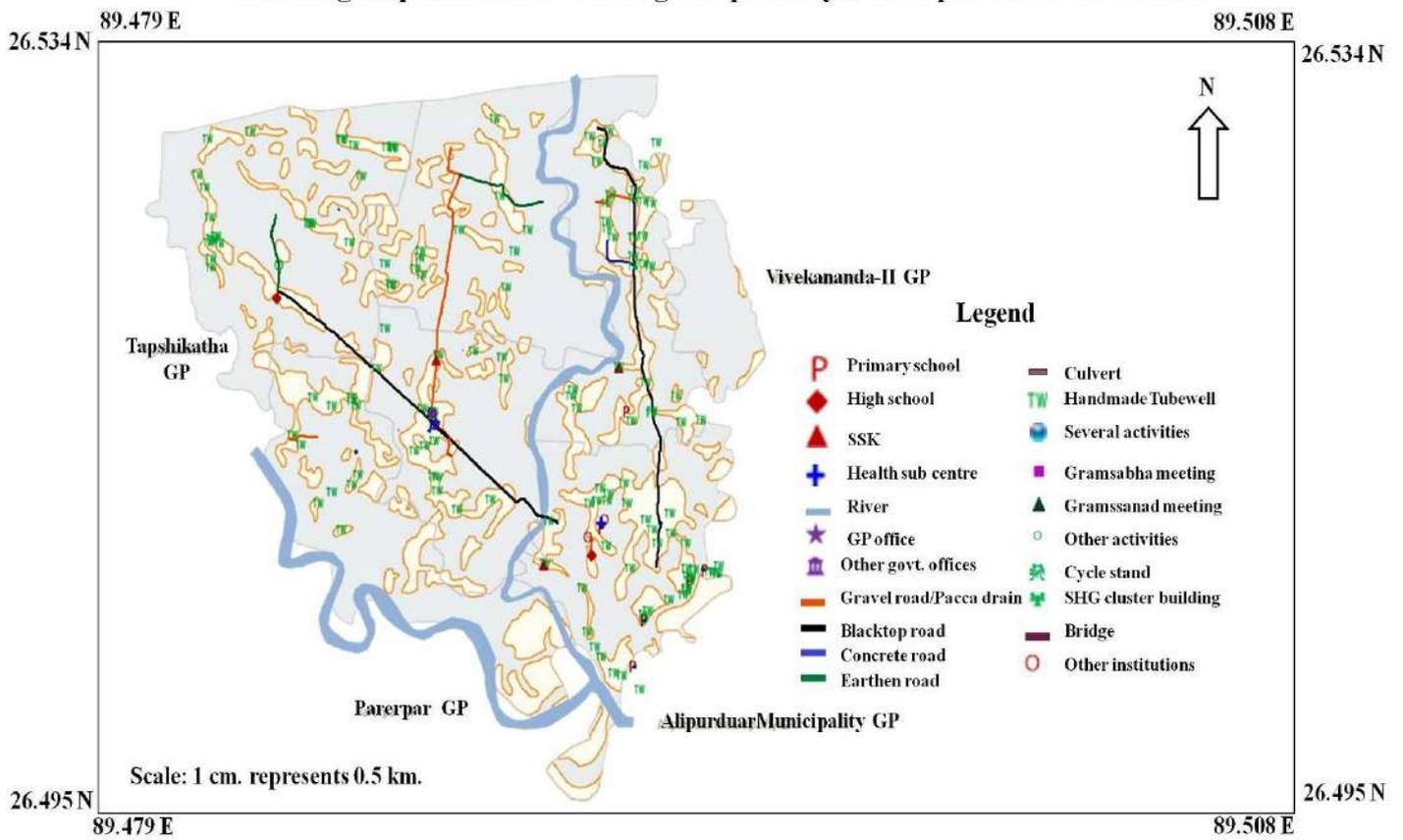
LANDUSE MAP OF PURULIA DISTRICT (2019)



Interpretation :-

In this land use map, there are vegetation in northern part and also in east and north-east, middle side of Purulia, which is high in density and indicated as green. We can noticed reticulated river which is flow from north to east and also some tributary river in the northern side of Purulia district, the river is mentioned by sky blue. There are agricultural land in all over the area of this locality and is highlighted by yellow. In the northern side and eastern side there are upland which is mentioned as grey. There are dense settlement pattern all over the area of Purulia district, this is highlighted in red colour. There are thick water body in north and east part of the area and also some water body can noticed all over the area of this map. The water body is indicated by deep blue.

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation :-

In this planning map of Banchukumari gram panchayet of Alipurduar, we can see a river running from north to east and a tributary river is joined from north-east side of the area. There are four primary school in the east corner. Also there are two high schools and two SSK, health centre, GP office, other government office in the same direction. So we can say that many of these official buildings, education and health sector is located in the east corner of this area. In this block there have pacca drain and gravel road in the middle portion of the area. There are two blacktop road in the middle and east part of this block. Each locality have there own handmade tubewell. There are concrete road in the north and north-east side of this block.

**REGIONAL PLANNING AND RURAL
DEVELOPMENT PRACTICAL**

Practical Copy

**Bhairab Ganguly College
(West Bengal State University)**

Department of the Geography

Submitted By

Snigdha Maity

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Semester: IV

Subject: Geography (PG)

Paper Code: GEOPDSE04P

M.Sc. in Geography

Pre-field Issues on Rural Research:

What is Research?

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.”

Inductive research methods analyse an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

Characteristics of research:

1. Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
2. The analysis is based on logical reasoning and involves both inductive and deductive methods.
3. Real-time data and knowledge is derived from actual observations in natural settings.
4. There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
5. It creates a path for generating new questions. Existing data helps create more research opportunities.
6. It is analytical and uses all the available data so that there is no ambiguity in inference.

What is the purpose of research?

There are three main purposes:

1. **Exploratory:** As the name suggests, researchers conduct exploratory studies to explore a group of questions. The answers and analytics may not offer a conclusion to the perceived problem. It is undertaken to handle new problem areas that haven't been explored before. This exploratory process lays the foundation for more conclusive data collection and analysis.
2. **Descriptive:** It focuses on expanding knowledge on current issues through a process of data collection. Descriptive studies describe the behavior of a sample population. Only one variable is required to conduct the study. The three primary purposes of descriptive studies are describing, explaining, and validating the findings.
3. **Explanatory:** Causal or explanatory research is conducted to understand the impact of specific changes in existing standard procedures. Running experiments is the most popular form.

Types of research methods and example:

Research methods are broadly classified as Qualitative and Quantitative.

Both methods have distinctive properties and data collection methods.

Qualitative methods -Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-

numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Types of qualitative methods include:

1. One-to-one Interview
2. Focus Groups
3. Ethnographic studies
4. Text Analysis
5. Case Study

Quantitative methods -Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

Types of quantitative methods include:

1. Survey research
2. Descriptive research
3. Correlational research

8 tips for conducting accurate research

1. Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.
2. Keep track of the frequency with which each of the main findings appears.
3. Make a list of your findings from the most common to the least common.
4. Evaluate a list of the strengths, weaknesses, opportunities, and threats that have been identified in a SWOT analysis.
5. Prepare conclusions and recommendations about your study.
6. Act on your strategies
7. Look for gaps in the information, and consider doing additional inquiry if necessary
8. Plan to review the results and consider efficient methods to analyse and dissect results for interpretation.

Literature search on research problem stated

Literature review-

A **literature review** is an overview of the previously published works on a specific topic. The term can refer to a full scholarly paper or a **section** of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

Producing a literature review is often a part of graduate and post-graduate student work, including in the preparation of a thesis, dissertation, or a journal article.

Why write a literature review?

When you write a thesis, dissertation, or research paper, you will have to conduct a literature review to situate your research within existing knowledge. The literature review gives you a chance to:

- Demonstrate your familiarity with the topic and scholarly context
- Develop a theoretical framework and methodology for your research
- Position yourself in relation to other researchers and theorists
- Show how your research addresses a gap or contributes to a debate

You might also have to write a literature review as a stand-alone assignment. In this case, the purpose is to evaluate the current state of research and demonstrate your knowledge of scholarly debates around a topic.

The content will look slightly different in each case, but the process of conducting a literature review follows the same steps.

There are five key steps:

1. **Search** for relevant literature
2. **Evaluate** sources
3. **Identify** themes, debates and gaps
4. **Outline** the structure
5. **Write** your literature review

A good literature review doesn't just summarize sources—it analyses, synthesizes, and critically evaluates to give a clear picture of the state of knowledge on the subject.

What is a research gap?

Let us begin with understanding what a research gap means. When you read papers or books on topics of your interest, you may realize there are some areas that have significant scope for more research but they have not been tapped by other researchers. In other words, no one has picked up or worked on these ideas. A research gap or a literature gap refers to such unexplored or underexplored areas that have scope for further research.

Here are 6 tips to identify research gaps:

1. Look for inspiration in published literature

- Read books and articles on the topics that you like the most. This will not only help you understand the depth of work done by researchers in your field but also provide an opportunity to ask questions that can lead you to a research gap.
- While reading research articles, you can focus on the Introduction section where the authors explain the importance of their research topic and the gaps they have

identified and attempted to fill through their research. Also, look at the directions or suggestions for further research that the authors have made as that could be highly inspiring.

- Read meta-analyses and review papers to learn more about the developments and trends in research over the years in the area of your liking. This will help you get acquainted with the problems that have been researched upon in the past as well as trending queries on those topics that you find interesting.

2. Seek help from your research advisor

- Discuss the issues and problems in your field with your research advisor to generate ideas for research. Articulating your ideas and knowing what others think and are working on may help you identify your study area or even identify mistakes in your approach. If you think a question would be interesting to work on, you can discuss it with your advisor and get their suggestions.

3. Use digital tools to seek out popular topics or most cited research papers

- To familiarize yourself with the trending queries in your field, you can use digital tools as they can save time and help you cast a wider net in your search for a research gap. Websites like [Essential Science Indicator](#) that identify the most cited papers in a field along with the emerging branches, influential contributors, publications, and countries in that field can be immensely useful to know which topics are considered important. You can also use [Google Trends](#) to learn more about the popular questions related to your research area. This will ease your search for an untapped area in your research field.

4. Check the websites of influential journals

- The websites of prominent journals often have a section called ‘key concepts’ where experts in an area highlight the central ideas in that field. Reading through this section can help you gain a lot of insights and generate new ideas as well. Moreover, you should also look through the reference section of these papers as it can lead you to important resources on the topic.

5. Make a note of your queries

- It is a good practice to note all the questions that cross your mind while reading any published literature. If possible, you should map the question to the resource it is

based on. "Keep track of what the authors told you and the questions that occur to you whenever you read anything - an article, a book, a book chapter, a dissertation, etc." advises Nadine Anderson, Behavioral Sciences and Women's and Gender Studies Librarian at the University of Michigan. She says that this will also help in ensuring that there is no unintended plagiarism in your research paper. You can use tables, charts, pictures, or tools to maintain a record. This can help you in the long run when you are developing your idea into a research problem or even when writing your manuscript.

6. Research each question

- Once you have a list of questions that could be explored, you must conduct thorough research on them. What does this mean? Read more about each doubt or query that you have. Find out if other researchers have had similar questions and whether they have found answers to them. This will help you avoid duplication of work.

What is Research problem?

A research problem is a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. In some social science discipline the research problem is typically posed in the form of a question. A research problem does not state how to do something, offer a vague or broad proposition, or present a value question.

The purpose of a problem statement is to:

Introduce the reader to the importance of the topic being studied. The reader is oriented to the significance of the study and the research questions or hypotheses to follow.

Places the problem into a particular context that defines the parameters of what is to be investigated.

Provides the framework for reporting the results and indicates what is probably necessary to conduct the study and explain how the findings will present this information.

How to identify a research problem?

After choosing a specific topic for your academic paper, you need to state it as a clear research problem that identifies all the issues that you'll address. It's not always simple for students to formulate it. In some fields, they may end up spending a lot of time thinking, exploring, and studying before getting a clear idea of what research questions to answer.

Some research paper topics are too broad to give a researchable issue. For example, if you decide to study certain social issues, like child poverty, remember that they don't provide any researchable question. These are very broad to address and take a lot of time and resources to become unfeasible so that your study will lack enough focus and depth.

After doing these 3 steps, we can do our research.

Framing research questions and hypothesis

Research questions-

research question is 'a question that a research project sets out to answer'. Choosing a research question is an essential element of both quantitative and qualitative research. Good research questions seek to improve knowledge on an important topic, and are usually narrow and specific.

How to frame a hypothesis from research question?

A hypothesis by definition is a proposition or a number of propositions that reflect a prediction. In simpler words, a hypothesis is a statement that assumes a relationship between an independent variable and a dependent variable. In research, hypotheses provide the basis for data collection and data analysis. The data analysis is essentially applications of research tools and techniques to prove or disprove the hypothesis. However, before testing, it is important to frame the hypotheses properly. This sometimes poses a challenge.

Need for framing a hypothesis from research questions

Not all types of research require a hypothesis. The need for framing a hypothesis stems from the research questions and the research methodology. It depends on the research approach, research type, and research method. Framing a hypothesis is essential in cases:

When the research type was descriptive-

Descriptive research is the one that aims to collect information and analyse it statistically to draw conclusions. For example, let a primary study want to investigate the effects of

organizational factors on job satisfaction of employees. Moreover, several organizational factors identified in the literature review are: remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and, scope of promotion. The hypothesis, in this case, will test the effect of these factors on job satisfaction of employees.

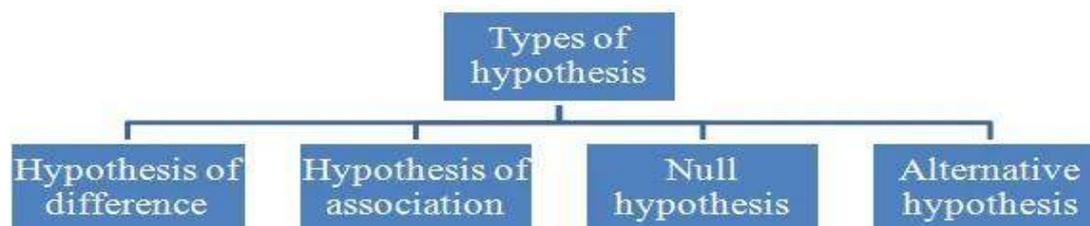
When the research approach is deductive-

A deductive approach of research emphasizes causality and aims test a theory with the help of a hypothesis. Suppose one wants to examine the Economic theory of export-led growth. This theory states that a country can achieve an accelerated rate of growth by relying on the expansion of exports. There are several factors such as foreign direct investment (FDI), trade openness, exchange rate, bilateral and multilateral trade agreements among others that the literature identifies as related to export expansion. In this case, the hypothesis will be framed to determine the effects of these factors on the growth rate.

When the research method is quantitative-

A quantitative research method is the one that is based on the measurement of variables. It useful to assess the effect of GDP and the current account deficit of a country on its fiscal deficit. GDP, current account deficit and fiscal deficit all are measured and published in monetary units. The hypothesis, in this case, will be framed to measure the effect of GDP and CAD on the fiscal deficit.

Types of hypothesis



A hypothesis can be stated in a number of ways. Consider the example research on student performance (grades) in relation to counselling. These are the types of hypotheses that depend on the objective of the study.

- **The hypothesis** of difference. There is a significant difference between the average performance of students who receive counselling and those who do not.
- The hypothesis of association. There are equal numbers of students in the classroom who receive counselling and who do not receive counselling.
- **Null hypothesis.** There is no relationship between counselling and the grades received by students in the classroom.
- **Alternative hypothesis.** There is a significant relationship between counselling and the grades received by students in the classroom.

Furthermore, if the research predicts that there is a significant relationship between counselling and student performance. The alternative hypothesis reflects this prediction. The null hypothesis is framed in such a way that it can be refuted to confirm the alternative hypothesis.

Format of a hypothesis:

Consider the example of organizational factors and job satisfaction mentioned above.

- Make a flow chart before framing the hypotheses. This is called a conceptual framework and it helps in framing the hypotheses in a systematic way. In the conceptual framework, list the independent variables or the factors on the left-hand side. The dependent variable 'job satisfaction' should be on the right-hand side. Use an arrow in between. The directionality of the arrow should be from the independent variables to the dependent variable.
- Following the conceptual framework, the independent variables should come on the left-hand side of the hypothesis. The dependent variable should be on the right-hand side of the hypothesis.
- Include words like 'impact', 'influence', 'effect', 'relationship' or 'association' within the hypothesis. This is to indicate what tests can be used in testing it.
- Use notation H_0 to denote the null hypothesis.
- Use notation H_A to denote the alternative hypothesis.

Following the above rules, the null and the alternative hypotheses in case of the above example are:

H_0 : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have no effect on the job satisfaction of employees.

H_A : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have a significant effect on the job satisfaction of employees.

Steps for constructing a hypothesis:

- The first step before constructing a hypothesis is a thorough review of existing literature on the topic of research.
- After the literature review, identify gaps in the literature. Then narrow down the research problem to fulfill the gap.
- The research problem needs to be stated in terms of research objectives or research questions.

- Following the research question, identify the dependent and the independent variables.
- Frame statements or hypotheses that reflect a prediction and are testable.
- The results of hypothesis testing directly help to answer the research questions and draw conclusions for the study.

Important points:

While framing hypotheses, these are the important points one needs to remember.

- The hypothesis should be precise and clear.
- It should be stated in simple terms.
- The hypothesis should propose a relationship between two variables or a set of variables namely dependent and independent variables.
- The scope of the hypothesis should be specific and narrow.
- The hypothesis should conform to the research questions.
- It should be consistent with the findings of the previous researches or facts that are known and established.
- The hypothesis should be testable with primary or secondary data.
- The results of hypothesis testing should address the study's aim and objectives adequately.

Selecting study area and target population

Selecting study area-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work” deally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

Target populations-

Before research can begin the target population must be identified and agreed upon. The target population is the entire population, or group, that a researcher is interested in researching and analysing. A sampling frame is then drawn from this target population. For example, if the research was to identify approximately how many parents read a particular article in their child's school newsletter, the target population would be all parents of children at that school. The target units would then be the individual parents, and the school could provide a list of parent contact details which would serve as a sampling frame.

Identifying and collecting relevant secondary data

Secondary Data- Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

Data classified as secondary for particular research may be said to be primary for another research. This is the case when data is being reused, making it primary data for the first research and secondary data for the second research it is being used for.

Steps of collecting secondary data-

1. **Termine your research question** – As indicated above, knowing exactly what you are looking for
2. **Locating data**– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.
3. **Evaluating relevance of the data** – Considering things like the data's original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. **Assessing credibility of the data** – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.
5. **Analysis** – This will generally involve a range of statistical processes as discussed in Chapter 13.

Survey schedule and questionnaire

- The research process is incomplete without the collection of data, which starts after the identification of the research problems and chalking out research design.
- There are several methods involved in the collection of primary data, like observation, interviews, questionnaires, schedules, etc.
- Both questionnaire and schedule are popularly used methods of collecting data in research surveys.

- There is much resemblance in the nature of these two methods and this fact has made many people to remark that from a practical point of view, the two methods can be taken to be the same.
- But from the technical point of view, there are many differences between the two common methods of data collection.

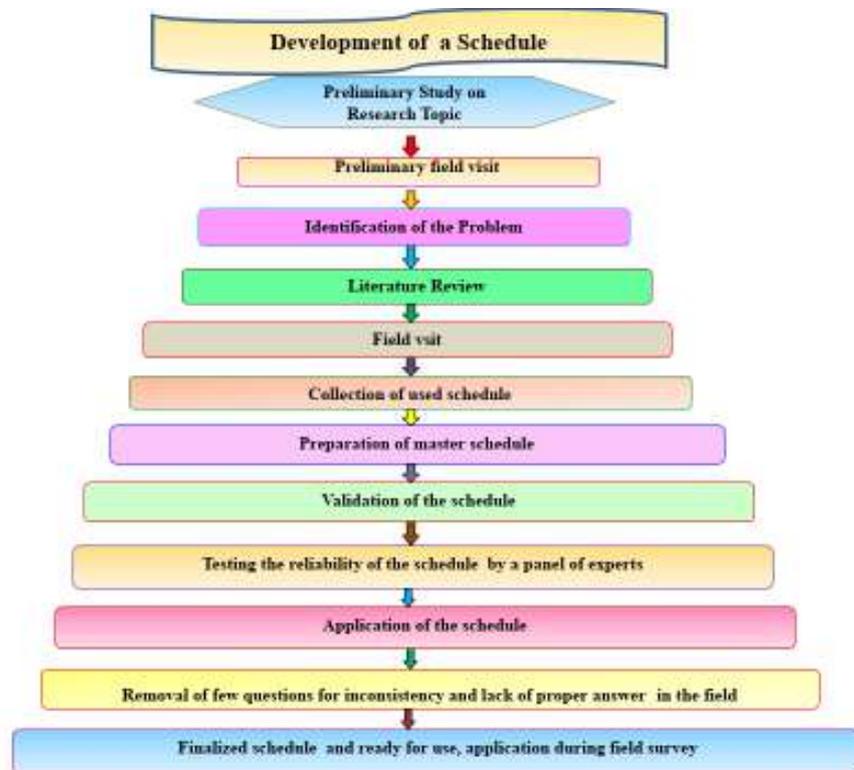
Similarities between survey and questionnaire-

- Both are set of related items having questions relating to a central problem.
- Both use mainly structured questions and these questions are so phased and interlocked that they have a built-in mechanism for testing the reliability and validity of the response.
- In both the same set of questions is administered to all the respondents and comparable results are obtained.
- Both these instruments have to be used with the same general principles of designs and have to take into account the same problems and basic difficulties they have to be limited in length.
- In both, the central problem has to be concentrated upon the following considerations involved in the problem of evolving the questionnaire and a schedule as a unit.
- Drawing the responding into a situation through awake and interest.
- Proceeding from simple to complex questions.
- No early and sudden request for information of a personal and embracing intimate nature.
- Not asking embarrassing questions without giving the respondent an opportunity to explain himself.
- Moving smoothly from one item to another.
- In both certain types of questions have to be eliminated such as vague and ambiguous questions, emotionally charged questions, loaded and leading questions, questions eliciting no response and questions having a structured response to the queries, violence to the existing facts.
- In both pilot studies and pre-tests are necessary for formulating the instrument and for bringing them to the final form. They have to go through the same stages of development.

Differences between survey schedule and questionnaire -

- The questionnaire refers to a technique of data collection which consists of a series of written questions along with alternative answers.
- The schedule is a formalized set of questions, statements, and spaces for answers, provided to the enumerators who ask questions to the respondents and note down the answers.
- While a questionnaire is filled by the informants themselves, enumerators fill the schedule on behalf of the respondent.

Prepare a schedule-
Prepare a questionnaire-



ISSUES ON FIELD RESEARCH

PILOT STUDY BASED ON QUESTIONNAIRE

Definition: A pilot study is a preliminary small-scale study that researchers conduct in order to help them decide how best to conduct a large-scale research project. Using a pilot study, a researcher can identify or refine a research question, figure out what methods are best for pursuing it, and estimate how much time and resources will be necessary to complete the larger version, among other things.

Process of Piloting a Survey Questionnaire

- Selecting the pilot sample: For large or complex surveys, it is a good idea to do a full pilot before starting actual data collection. To do a pilot a researcher need to test all the survey steps from start to finish with a reasonably large sample. The size of the pilot sample depends on how big the actual sample of the researcher is, and how many data collectors the researcher has. For a typical baseline or endline survey a sample of around 30-50 people is usually enough to identify any major bugs in the system.
- Implementation of all the steps from start to finish: The researcher will start by training his data collectors, if he has them. Then the researcher will distribute and collect the survey, after which he will enter the completed surveys into the database that he has planned to use and will test the analysis that he has planned to perform.
- Making improvements: Assuming that the survey was pretested, piloting will normally identify practical problems with implementation, rather than problems with the survey design. For example, lack of staff training, challenges with the logistics of distributing and collecting the survey, or errors in data entry. These can then be fixed before the researcher do the actual survey.

Advantages of Conducting a Pilot Study:

Pilot studies are useful for a number of reasons, including:

- Identifying or refining a research question or set of questions
- Identifying or refining a hypothesis or set of hypotheses
- Identifying and evaluating a sample population, research field site, or data set
- Testing research instruments like survey questionnaires, interview, discussion guides, or statistical formulas
- Evaluating and deciding upon research methods
- Identifying and resolving as many potential problems or issues as possible
- Estimating the time and costs required for the project
- Gauging whether the research goals and design are realistic
- Producing preliminary results that can help secure funding and other forms of institutional investment

After conducting a pilot study and taking the steps listed above, a researcher will know what to do in order to proceed in a way that will make the study a success.

ETHNOGRAPHIC FIELD DIARY

Ethnographic data is collected in a variety of ways that involve the researcher being embedded in the field in a variety of ways. Ethnographers collect data by observing in the field. This includes both structured and unstructured observations, along with participant observations. In addition, ethnographers engage in formal and informal interviews and focus groups with subjects. Often researchers will engage in a variety of methods for one research project and this data collection will occur over a period of time. An ethnographer may spend days, months or even year in one **field site** to observe an interview research subject. A field site is the location on the environment an ethnographer is studying. It can be virtually any place- a school, workplace, community, home, street and even in the online world. This **triangulation** of ethnographic methods- using a variety of methods in a field site--- help the researcher to gather as much data as possible to identify trend, patterns and nuances of the field they are studying.

As a result of the intensive data collection method that ethnographers engage, researchers often end up with a good deal of data to analyze. It is therefore important for ethnographers to have a plan on exactly they will collect their data before they head into the field.

LONGITUDINAL STUDY

Definition: A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

Working procedure of Longitudinal Study:

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and

how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Benefits of Longitudinal Study:

A longitudinal study can provide unique insight that might not be possible any other way. This method allows researchers to look at changes over time. Because of this, longitudinal methods are particularly useful when studying development and lifespan issues. Researchers can look at how certain things may change at different points in life and explore some of the reasons why these developmental shifts take place.¹For example, consider longitudinal studies that looked at how identical twins reared together versus those reared apart differ on a variety of variables. Researchers tracked participants from childhood into adulthood to look at how growing up in a different environment influences things such as personality and achievement. Since the participants share the same genetics, it is assumed that any differences are due to environmental factors. Researchers can then look at what the participants have in common versus where they differ to see which characteristics are more strongly influenced by either genetics or experience.

Drawbacks of Longitudinal Study:

- **Longitudinal Studies Can Be Expensive:** Longitudinal studies require enormous amounts of time and are often quite expensive. Because of this, these studies often have only a small group of subjects, which makes it difficult to apply the results to a larger population.
- **Participants Tend to Drop Out Over Time:** Another problem is that participants sometimes drop out of the study, shrinking the sample size and decreasing the amount of data collected. This tendency is known as selective attrition. Participants might drop out for a number of reasons, like moving away from the area, illness, or simply losing the motivation to participate. In some cases, this can influence the results of the longitudinal study. If the final group no longer reflects the original representative sample, attrition can threaten the validity of the experiment. Validity refers to whether or not a test or experiment accurately measures what it claims to measure. If the final group of participants is not a representative sample, it is difficult to generalize the results to the rest of the population.

CASE STUDY RESEARCH

Definition: Case study research is that in which the subject of the research is studied within its social, political, organizational, or economic context and it is one of the commonest approaches across the social and management sciences.

Many authors cite Yin, who describes case study research as:

" ... an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, location no. 638-650).

In other words, the subject of the research is comprehensively studied as an example of a real live phenomenon, within the context in which it happens.

How & when is the Case Study method used?

According to Yin (2006), case study research is best applied when the research addresses descriptive or explanatory questions: i.e. what happened, how, and why?

It is also good for describing a situation or phenomenon occurring in the present, where in-depth description is useful and where the researcher does not need to manipulate events.

Yin (2003) identifies three types of case studies:

1. Exploratory: the case study is used to define questions and hypotheses – or to test out a research procedure – for a further piece of research, such as a large-scale survey.
2. Descriptive: the case study is used to describe a particular phenomenon within its context. It can be used to expand on a particular theme unearthed by a survey.
3. Explanatory: the case study explores cause-effect relationships, and/or how events happen.

Only the third of these approaches can stand up as a method in its own right, and not as an ancillary to other quantitative approaches such as surveys or field experiments.

Advantages of the Case Study as a Research Method

- a) Case studies are "real" – they offer a chance to get a snapshot of real life: a rich and thick picture. As such, they are most appropriate for dealing with a subject that is context dependent, complex, unusual, or where there is some ambiguity.
- b) In direct contrast to positivist approaches, which seek to generalise, the case study offers particularity: i.e. the opportunity for a holistic approach without the distraction of too many variables.
- c) While it offers depth and specificity, case study research also offers breadth and diversity in terms of methods of data collection and analytical techniques. For example, one case study can incorporate surveys, interviews, direct observation, and archival research. This offers the possibility of several different layers of analysis which can reveal several different perspectives, with the added benefit of triangulation of the results.

- d) According to Woodside (2010, pp. 2-3) the usefulness of case study research lies in the fact that it encourages research methods that help measure thinking over an ongoing period, for example by multiple interviews.
- e) It can also be a useful method when the unit of analysis, or the subject under consideration, is a collective entity such as an organisation or a community.

Disadvantages of the Case Study as a Research Method

- a) The most common objection to case study research is that it is insufficiently rigorous. Quite often this criticism relates not to the method as such, but to the way case studies are presented: the author does not leave a clear audit trail detailing his or her research and explaining the conclusions.
- b) Case studies are often seen as a "bolt-on" to a major research project, defining research questions or throwing further light on an issue that has been revealed by a survey. That explanatory research can offer an understanding of a phenomenon is viewed with scepticism by some, on the grounds that a single case study cannot yield a sufficient volume of evidence on which to generalise.

ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

In order to act on the data collection, a researcher will most likely have to engage with his student population and other stakeholders. When approaching students with data collection requests it is important to be aware of certain ethical considerations.

Ethical considerations refer to the ethical practices of how data is collected, stored or shared. These can include securing clear and informed consent, how to safely store data or how to secure permissions to use or share data. Here are some common ethical considerations that a researcher needs to think through before collecting his data:

Informed Consent: Informed consent refers to written consent by a person to participate in any given evaluation activity where private data and information may be collected. A document is typically prepared that outlines the goals of the evaluation, why data is being collected from whom and how, how it will be stored, for how long and who will have access to it. Facilitators or data collectors are required to ensure that participants understand this information and provide informed consent.

Confidentiality and Anonymity: Confidential data refers to information that is connected to a particular individual but kept confidential such as medical or service records. Anonymous data is information that cannot be traced to a particular individual. Both kinds of data may prove useful, but it is important to ensure that participants know if and how the information they provide is either confidential or anonymous.

Clear Communication and Data Sharing: While it is important to have clear processes for collecting data, it is equally important to have clear processes for sharing data. This is especially true when individual data is private and sensitive such as mental health or addiction related information. It is useful to let participants know that any information gathered is aggregated in the analysis process as a way of ensuring privacy of individual data.

PARTICIPATORY RURAL APPRAISAL

Definition

Participatory rural appraisal (PRA) Or participatory learning and action (PLA) is the fieldworkers use of participatory approach. The PRA continues to evolve so fast that no definitions can be final and has to be updated several times. PRA is defined and updated several times by Prof. Robert Chambers. PRA has been described as

and analyse the realities of their lives and condition, and themselves to plan, monitor and evaluate their actions (chambers, 1994).

empower people to share, analyse and enhance their knowledge of life and conditions, and to plan, act, monitor, evaluate and reflect (Chambers, 2004).

PRA is a flexible, low cost and time saving set of approaches and methods used to enable workers to collect and analyze information in terms of past, present and future situations to understand the rural populace and the condition that exists in rural areas which would provide a thorough and comprehensive idea regarding problems, potentials, resources and solutions to formulate realistic development practitioners to achieve the desired goals within specific time (Chambers1992). Participatory approaches like PRA are now becoming a basic approach in rural development and a wide range of examples can be found in the literature for natural resources and communally owned land: resource economics (Pretty and Scoones 1989), resource planning (Scoones and McCracken 1989), and community forestry (Molnar 1989 and Messerschmidt 1991). The use of the PRA also brought forth the adaptability of PRA tools and their use in the research process (Szymanski, et.al 1997). Locally, participatory processes create the possibility for creating linkages between survival strategies, knowledge systems, knowledge network and sustainable livelihoods (Gupta, 1997).

The PLA/PRA approach is used with the following assumptions:

1. Rural communities form active foundation for rural development
2. Communities need committed local leaders to stir up their development
3. Communities have knowledge and information but it needs to be organized

4. Communities have resources but they need to be mobilized. They can introduce projects, acting primarily on their own resources.

5. Community organizations are among the many, which are under utilized resources available for development efforts.

6. External units such as Government technical experts and extension workers, NGOs, and international organizations often can provide substantial technical, financial or managerial assistance that is critical to rural communities.

7. Thus, PLA/PRA brings together on the one hand, development needs defined by the community members and on the other, skills of Government, donor agencies and NGOs. It integrates traditional knowledge systems and external technical knowledge in the development process.

PRA helps communities to:

- Mobilize their human and natural resources
- Define problems
- Consider previous successes and failures
- Evaluate priorities and opportunities
- Prepare a systematic and site specific plan of action (CPA)

The objectives of the PRA

The content included in the PRA are simple and do not require high caliber or mathematical thinking. But require minds which are prepared to accept a new way of learning, a new of doing things and that we have limited knowledge of something. The ultimate aim of PLA/PRA workshop is:

1. To build up a permanent “people first” attitudes in the minds of the participants. To show that “people are capable agents to change their own lives” but require limited out side assistance.
2. To establish a notion of “respect” to the people’s knowledge in the life of professionals and their institutions.
3. To provide simple analytical tools to analyze rural situations.
4. To show some of the analytical tools to the community in the field setting and understand their suitability to farmer situation.
5. To enhance participant’s ability to plan with the community.

PRA TECHNIQUES AND METHODS

The most common methods are the following:

Diagramming, Mapping and Modeling: - transects - maps (resource, social, farm)

venn diagrams - seasonally analysis - historical analysis (time lines, trend lines, activity profiles)

Ranking and scoring - pair wise ranking - matrix ranking - matrix scoring - well-being analysis and wealth ranking - proportional piling –

pie charts (injera charts) Problem analysis - identification and specification - causal chaining - prioritization

Maps and Models – Diagrams

APPLICATION AND USES OF PRA

The PRA is not purely a new method, but is an adoption and development of various other methods/approaches that were developed before it, such as:

1. Andragogy of Education

A well-known expert in education from Brazil, Paulo Freire (1971), gave plenty of critics on the education system that was not participative and did not empower the students. He criticized the conventional education and counseling ways—by referring to it as domestication—as a form of imperialism in the education system. This philosophy of participative education in the system of education and counseling is adopted by the PRA method.

2. The Field of Research and Science

According to Robert Chambers (1992) there are five main trends that decorate the principle method of PRA:

a) **Participatory Action Research**, born from the suggestion of Paulo Freire, stating that the poor can and have the possibility to analyze their own facts and conditions. Recognition of the ability of the village community in analyzing their problems is adopted into PRA;

b) **Agro-ecosystem Analysis**, is a combination between system analysis with ownership system by analyzing space, time and the cause-effect relation, relative values and decision making. The methods that were adopted into PRA from this method are the transect technique (locational trace), mapping, seasonal calendar, Venn diagram (inter-party relations) and ranking matrix;

c) **Applied Anthropology**, created as an effect of the critics to the science of pure anthropology that emphasize more on the comprehension of the community. Applied Anthropology is intended to judge the ability and validity of village community knowledge and to differ between the soul-frame of the outsider with the insider. What PRA adopts from applied anthropology is that studying outside in the fields is a flexible art and not a science that is rigid, the difference between emic (community norms) and etic (scientific norms), the validity of indigenous technical knowledge of the village community;

d) **Field Research on Farming System**, the focus of attention is in field research participation, because the farmers as the main actors in agriculture are very experienced

people that have their own ways to maintain the live of their agricultural system. This method contributes to PRA its yard/garden sketching technique;

e) Rapid Rural Appraisal/PRA, developed because of a number of reasons. The first being the increase of disappointment against anti-poverty bias as the result of “village development tourism”. The bias referred to are: spatial bias (people only come to visit villages that are still close to the city, the main roads and village center, and ignore the borderline villages); project bias (only provide attention and support for villages that are in a project’s area); personnel bias (favors men better than women, the elite than the poor, the service users than the non-users, etc.); seasonal bias (preference to visit the villages during the dry season or during harvest time compared to the wet season or time of famine); diplomatic bias (people from the outside do not wish to meet poor people or see appalling conditions that can touch their hearts). All those biases can combine to conceal the worst poverty of all. The second reason is the disappointment of conventional survey methods. For years and in many places, experience has shown that surveys using questionnaire tend to be over-rated, boring and confusing. The data received are often inaccurate. It also takes a long time to report, is boring and difficult to use, which in the end is often abandoned. The third reason is there has been efforts to find a new and better method that is more effective, by empowering the indogenous technical knowledge of the village community as a source of information to analyze and use for the experts from outside.

FOCUS GROUP DISCUSSION

Definition

A focus group discussion involves **gathering people from similar backgrounds or experiences** together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group.

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.
- Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not dominate it, and so that those participants who tend not to be highly verbal are able to share their views.
- Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

POST FIELD TECHNIQUES: METHODS OF REPORT WRITING

The purpose of a field report in the social sciences is to describe the observation of people, places, and/or events and to analyse that observation data in order to identify and categorize common themes in relation to the research problem underpinning the study. The content represents the researcher's interpretation of meaning found in data that has been gathered during one or more observational events.

How to Begin

Field reports are most often assigned in disciplines of the applied social sciences. It is important to build a bridge of relevancy between the theoretical concepts learned in the classroom and the practice of actually doing the work you are being taught to do. Field reports are also common in certain science disciplines but these reports are organized differently and serve a different purpose than what is described below.

Professors will assign a field report with the intention of improving your understanding of key theoretical concepts by applying methods of careful and structured observation of, and reflection about, people, places, or phenomena existing in their natural settings. Field reports facilitate the development of data collection techniques and observation skills and they help you to understand how theory applies to real world situations. Field reports are also an opportunity to obtain evidence through methods of observing professional practice that contribute to or challenge existing theories.

We are all observers of people, their interactions, places, and events; however, your responsibility when writing a field report is to conduct research based on data generated by the act of designing a specific study, deliberate observation, synthesis of key findings, and interpretation of their meaning.

THINGS NEED FOR REPORT WRITING:

- **Systematically observe and accurately record the varying aspects of a situation.** Always approach field study with a detailed protocol about what you will observe, where you should conduct your observations, and the method by which you will collect and record your data.
- **Continuously analyse of observations.** Always look for the meaning underlying the actions you observe. Ask yourself: What's going on here? What does this observed activity mean? What else does this relate to? Note that this is an on-going process of reflection and analysis taking place for the duration of your field research.
- **Keep the report's aims in mind while you are observing.** Recording what you observe should not be done randomly or haphazardly; you must be focused and pay attention to details. Enter the observation site [i.e., "field"] with a clear plan about what you are intending to observe and record in relation to the research problem while, at the same time, being prepared to adapt to changing circumstances as they may arise.
- **Consciously observe, record, and analyse what you hear and see in the context of a:** theoretical framework. This is what separates data gatherings from reporting. The theoretical framework guiding your field research should determine what, when,

and how you observe and act as the foundation from which you interpret your findings in relation to the underlying assumptions embedded in the theoretical framework.

Photography

With the advent of smart phones, an almost unlimited number of high quality photographs can be taken of the objects, events, and people observed during a field study. Photographs can help capture an important moment in time as well as document details about the space where your observation takes place. Taking a photograph can save you time in documenting the details of a space that would otherwise require extensive note taking. However, be aware that flash photography could undermine your ability to observe unobtrusively so assess the lighting in your observation space; if it's too dark, you may need to rely on taking notes. Also, you should reject the idea that photographs represent some sort of "window into the world" because this assumption creates the risk of over-interpreting what they show. As with any product of data gathering, you are the sole instrument of interpretation and meaning-making, not the object itself.

Field note:

There are two primary type of field note:

1. Descriptive field note:

It provides in depth descriptions and depiction of particular setting and events as well as objectives, activities, behaviours and interactions make up these contexts.

- Description of participants
- Description of setting or context
- Discussion and dialogue
- Accounts of behaviour and activities
- Observers behaviour

2. Reflective field notes:

It contain reflective commentary are often focused on the role of the research in relation to the setting and participation, providing the opportunity for resource.

- Reflective commentary
- Role or stances of the research in relation to the setting and participation
- Ethical dilemmas
- Methodological challenges and obstacles
- revelations and epiphanies

Video and Audio Recordings

Video or audio recording your observations has the positive effect of giving you an unfiltered record of the observation event. It also facilitates repeated analysis of your observations. This can be particularly helpful as you gather additional information or insights during your research. However, these techniques have the negative effect of increasing how intrusive you are as an observer and will often not be practical or even allowed under certain circumstances.

Illustrations/Drawings

This does not refer to an artistic endeavour but, rather, refers to the possible need, for example, to draw a map of the observation setting or illustrating objects in relation to people's behaviour. This can also take the form of rough tables, charts, or graphs documenting the frequency and type of activities observed. These can be subsequently

placed in a more readable format when you write your field report. To save time, draft a table [i.e., columns and rows] on a separate piece of paper before an observation if you know you will be entering data in that way.

Participant observation:

Participatory observation is a central data collection approach within anthropology and other fields such as sociology, psychology, and education; it involves either formal or informal information observation of setting, activities, and events such as meeting, performance,

PRA

PRA is a process which extends into analysis, planning and action. The World Bank defines PRA as a 'family of participatory approaches and methods which emphasize local knowledge and enable local people to do their own appraisal, analysis and planning. 'PRA uses group animation and exercises to facilitate information sharing, analysis and action among stakeholders.

the principles of PRA are: 1) 'handing over the stick' which means surrendering authority to local people in the learning processes, 2) ability to conduct critical examination by and of facilitators of their own roles, personal responsibility i.e. 'using one's own best judgment at all times', 3) multi way sharing of ideas and information and 4) stimulation of 'community awareness'

Focus Group Discussion (FGD)

FGD Campbell (2008) defines a FGD as "a planned, facilitated discussion among a small group of stakeholders designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment". It is the method of rapid assessment and data gathering in which participants congregate to talk about the specific issues and concern based on a list of key themes drawn up by the researcher/facilitator. The main objective of focus group discussion is to acquire knowledge regarding the particular issue. It can be used to collectively assemble and analyse information for many purposes such as the adoption of a particular innovation, needs assessment (Tipping, 1998), program evaluation. For conducting a focus group discussion, a facilitator and assistant to facilitator are needed. The facilitator leads the group discussion and encourages the participants. The assistant to the facilitator is to take notes, run the tape recorder, respond to the unexpected interruptions, and is always ready to follow the facilitator's mode of action. Knowledgeable, pleasing personality, politeness, ability to speak local language, respect to local norms and behaviour, ethics, patience etc. are the main criteria of a good facilitator.

Specific objectives of the FGD exercise this exercise was meant specifically to: 1) Understand the group's perceptions of climate change by identifying and ranking some of the main climate change problems presently under debate. 2) Identify and understand the major cause or triggers of the identified problems 3) Identify and understand some of the possible mitigation and adaptation strategy to Climate change. All these were meant to in effect expose the individual as well as groups perception of the present climate change issue under debate with the use of a FGD.

STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES

Who are stakeholders?

Stakeholders are persons, groups or institutions with interest in the project or programme. Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively. Secondary stakeholders are the intermediaries in the aid delivery process. This definition of stakeholder includes both winners and losers and those involved or excluded from decision making process. Key stakeholders are those, who can significantly influence or are important to the success of the project (ODA, 1995). This wide definition clearly includes ourselves (researchers) and farmers along with other disciplinary categories such as policy makers, extension officers, relevant government & nongovernmental organisations.

The word ‘stakeholder’ was first recorded in 1708 as ‘a person who holds the stake or stakes in a bet’ (Ramirez, 2001). In business context, a stakeholder as defined by Freeman (1984) is ‘any group or individual who can affect or is affected by the achievement of a corporation’s purpose’. However, Röling and Wagemakers (1998), in the context of natural resource management defined stakeholders as ‘natural resource users and managers’.

According to ODA (1995) and Allen and Kilvington (2001), there are two types of stakeholders.

i) Primary stakeholders: They are those who are (will be) ultimately affected either positively (e.g., beneficiaries) or negatively (e.g., those involuntarily resettled). They are immediate communities of interest.

ii) Secondary stakeholders: They are the intermediaries in the aid delivery process. They may include government agencies and other institutional bodies. Often these groups do not consider themselves as stakeholders because they feel they own the process.

There is another party called the *Tertiary Stakeholders*. This group consists of those individuals or organizations that do not have any particular ‘stake’ in the initiative. However, their activities affect the project’s functioning and outcome.

What Is Stakeholder Analysis?

A “stakeholder” can be defined as: Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

According to ODA (1995), stakeholder analysis is a tool by which the key stakeholders of a project are identified, their interest in the project is assessed and the ways in which are interest affects project riskiness and viabilities are judged.

Although stakeholder analysis finds its origin to business and managerial science, it is currently used in fields ranging from political science to policy development and international relations (Chevalier, 2001). The concept and related methodology have made significant

inroads to poverty reduction studies and applied research pertaining to issues of sustainable livelihood, community based natural resource and conflict management (Ramirez, 1999).

Applications of Stake holder Analysis (SA):

Although SA can be usefully applied to a wide range of policy and management contexts. It is more relevant in complex situations where there are compatibility problems between objectives and stake holders. It is suggested that SA is particularly relevant to natural resource issues where they are characterized by:

- Cross cutting systems and stake holder interests
- Multiple users and users of the resources
- Multiple objectives and concerns
- Temporal trade-offs
- Poverty and under representation
- Market failure

Steps in Stakeholder Analysis:

There are eight major steps in the process:

1. Planning the process: The first step in conducting a stakeholder analysis is to define the purpose of the analysis, identify the potential users of the information, and devise a plan for using the information. A discussion of these issues should be led by the “sponsor,” or initiator, of the stakeholder analysis.

2. Selecting and defining a policy: For a stakeholder analysis to be useful, it must be focused on a specific policy or issue. Again, policy is used in this document to refer to any national, regional, local, or institutional project, program, law, regulation, or rule. In most cases, the sponsor of the stakeholder analysis will have identified a policy, but it is important to ensure that the policy in question is an appropriate topic for a stakeholder analysis before the process begins.

3. Identifying key stakeholders: Identifying the key stakeholders is extremely important to the success of the analysis. Based on the resources available, the working group should decide on the maximum number of stakeholders to be interviewed.

4. Adapting the tools: Generally, very little secondary information is available on stakeholders. As a result, the working group should plan to interview the priority stakeholders identified to gain accurate information on their positions, interests, and ability to affect the process.

5. Collecting and recording the information: Before beginning the interviews, the working group should gather and review secondary information on the priority stakeholders. It should include any statements regarding the stakeholders’ positions on the policy, any goals or objectives of the organizations the stakeholders represent.

6. Filling in the stakeholder table: This step of the process involves taking detailed and often lengthy answers from the interviews and arranging them into a more concise and systematized format.

7. Analyzing the stakeholder table: Once the stakeholder table is complete, the information needs to be "analysed." Such an analysis should focus on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests, positions, and possible allies regarding the policy in question.

8. Using the information: Using the information generated by the preceding analysis is an integral part of the stakeholder analysis process.

Benefits/Advantages of stakeholder analysis:

- Identity stakeholders with conflicting interest and provide opportunity for finely adoption of conflict resolution strategies.
- The opinions and views of powerful and influential stakeholders serve as valuable inputs.
- The support and co-ordination of stakeholders are ensured.
- Ensure resource mobilization (both in terms of financial and non-financial).
- Help to identify relations between stakeholders who can be built upon and may enable 'Coalition' of project sponsorship, our-ship and co-operation.
- Identify stakeholders who are sources of risk as threat to the project.
- Identify stakeholders who need empowerment through capacity building or institutional building.
- Help to assess the appropriate type of participation by different stakeholders at successive stage of the project cycle.
- Help to avoid allocation of time and resources to unnecessary individuals or organizations.

Limitations of SA:

1. Though a powerful tool for problem analysis and illuminating the interests of underrepresented, it cannot in itself provide answers to problems.
2. SA, mirrors the groupings and interest of society and in itself does not try to make changes.
3. The process of analysis cannot be extended for examining the role of very large number of stake holders.
4. Cannot be tried to quantify stake holders' likely gains and losses, this is inherently qualitative tool and can best be employed as an illustrative aid to decision making.

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OR ANY SECTOR

A SWOT analysis makes it possible to assess the various strengths, weaknesses, opportunities and threats (SWOTs) within an organization or within the agricultural extension system as a whole. This factsheet examines the four elements of SWOT and the process of conducting an analysis. It provides tips for conducting the analysis and a ready-to-use SWOT analysis template. The factsheet concludes by looking at scenarios when a SWOT analysis is most appropriate, as well as its advantages and disadvantages.

What is SWOT analysis?

SWOT is an acronym for Strengths, Weaknesses, Opportunities, Threats. Occasionally, it may also be found as a 'WOTS up' analysis or the TOWS analysis. The technique is credited to Albert Humphrey who led a research project at Stanford University in the 1960s and 1970s using data from leading companies involved in long range planning processes.

A SWOT analysis is a planning tool used to understand key factors - strengths, weaknesses, opportunities, and threats - involved in a project or in an organisation. It involves stating the objective of the organisation or project and identifying the internal and external factors that are either supportive or unfavourable to achieving that objective. SWOT is often used as part of a strategic or planning process, but can be applied to help understand an organisation or a situation, and also for decision-making for many different scenarios.

The SWOT framework:

A SWOT analysis process generates information that is helpful in matching an organisation or group's goals, programs, and capacities to the environment in which it operates. The 'SWOT' itself is only a data capture exercise - the analysis follows later.

Strengths: positive tangible and intangible attributes, internal to an organisation and within the organisation's control.

Weaknesses: internal factors within an organisation's control that detract from the organisation's ability to attain the desired goal. Which areas might the organisation improve?

Opportunities: external attractive factors that represent the reason for an organisation to exist and develop. What opportunities exist in the environment, which will propel the organisation? Identify them by their 'time frames'.

Threats: external factors beyond the organisation's control which could place the organisation mission or operation at risk. The organisation may benefit by having contingency plans to address them if they should occur. Classify them by their severity and probability of occurrence.

The SWOT process:

Doing a SWOT analysis can be very straight forward, but its strengths lie in its flexibility and experienced application.

- Decide how the information is to be collected and by whom (often a team approach is much more powerful than one person's view).
- Identify appropriate sources of information.

- Gather the information - it's useful to use a template as the basis for exploring the factors and recording the information. See our practical and ready-to-use template below.
- Plot the findings.
- Identify the most important issues.
- Identify strategic options.
- Write a discussion document.
- Disseminate and discuss the findings.
- Decide which activities are a priority in the context of the organisation's goals and values – a possible action plan framework appears below.

The SWOT analysis tips:

Some useful tips for carrying out a SWOT analysis:

1. Collaborate - an analysis that involves multiple perspectives will deliver a better outcome.
2. Use expertise and resources that are already available within the organisation.
3. Use SWOT analysis in conjunction with other techniques, such as PESTLE analysis.
4. Incorporate the analysis into an ongoing process for monitoring changes in the business environment.
5. Try not to get bogged down collecting vast amounts of detailed information without analysing and understanding your findings appropriately.
6. Don't jump to conclusions about the future based on the past or present.

When to use a SWOT analysis:

A SWOT analysis can be used for:

- Workshop sessions.
- Generating ideas and solutions.
- Problem solving.
- Planning.
- Strategic planning (with PESTLE).
- Product evaluation.
- Competitor evaluation (with Porter's five forces).
- Personal development planning.
- Decision making (with Lewin's force field analysis).

For example, using SWOT in a team meeting might include the following steps:

- Invite contributors to participate in the SWOT process.
- Explain the process and establish ground rules.
- Identify strengths.
- Identify weaknesses.
- Identify or list the opportunities and threats – this may well have been identified from a PESTLE analysis previously.
- Establish priorities – from your mission, vision and values work.
- Question each list.

Advantages and Disadvantages of using SWOT analysis:

There are a number of advantages and disadvantages of using the SWOT approach to analysis. Advantages include:

- ❖ It's a simple four box framework.
- ❖ It facilitates an understanding of the strengths and weaknesses of the organisation.
- ❖ It encourages the development of strategic thinking.
- ❖ It enables senior managers to focus on strengths and build opportunities.
- ❖ It can enable an organisation to anticipate future business threats and take action to avoid or minimise their impact.
- ❖ It can enable an organisation to spot business opportunities and exploit them fully. It's flexible.

Disadvantages include:

- ❖ Some SWOT analysis users oversimplify the amount of data used for decisions – it's easy to use insufficient data.
- ❖ The risk of capturing too much data may lead to 'paralysis by analysis.'
- ❖ The data used may be based on assumptions that later prove to be unfounded.
- ❖ Access to quality internal data sources can be time consuming and politically difficult (especially in more complex organisations – parent company, etc).
- ❖ It lacks detailed structure, so key elements may get missed.
- ❖ The pace of change makes it increasingly difficult to anticipate developments that may affect an organisation in the future.
- ❖ To be effective, the process needs to be repeated on a regular basis.

AGE SEX PYRAMID

A population **pyramid** or " **age-sex pyramid** " is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically forms the shape of a pyramid when the population is growing.

HOW TO CREATE AGE SEX PYRAMID

STEPS –

1. First add the data on excel sheet.
2. Calculate the % of the male and female population from the data.

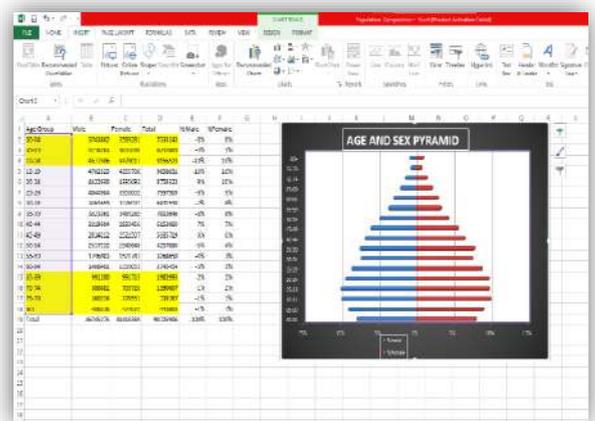
Age Group	Male	Female	Total
00-04	3743802	3589281	7333083
05-09	4218793	4031079	8249872
10-14	4677506	4479017	9156523
15-19	4702325	4355705	9058031
20-24	4422630	4335692	8758322
25-29	4044904	3953005	7997909
30-34	3464659	3376931	6841590
35-39	3523361	3489285	7012646
40-44	3219604	2933456	6153060
45-49	2814212	2521507	5335719
50-54	2317232	1940648	4257880
55-59	1746903	1521747	3268650
60-64	1406401	1339053	2745454
65-69	991280	991713	1982993
70-74	686881	703725	1390607
75-79	360216	379551	739767
80+	406536	477025	883561
Total	46745275	44418389	90725906



%male	%female
-8%	8%
-9%	9%
-10%	10%
-10%	10%
-9%	10%
-9%	9%
-7%	8%
-8%	8%
-7%	7%
-6%	6%
-5%	4%
-4%	3%
-3%	3%
-2%	2%
-1%	2%
-1%	1%
-1%	1%
-100%	100%

3. After Calculating the % of the male and female population from the data select the age group with both male and female % population.
4. Then go to insert select a suitable bar.

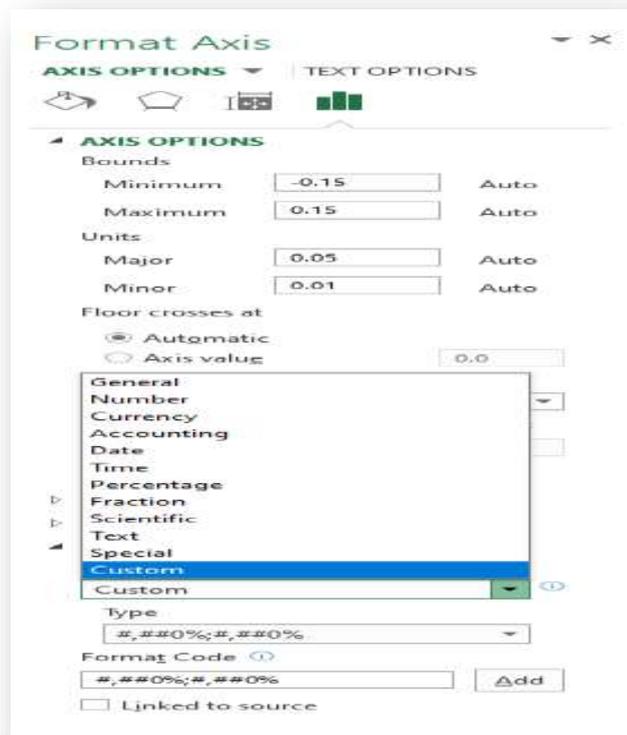
Age Group	Male	Female	Total	%Male	%Female
00-04	3743802	3589281	7333083	-8%	8%
05-09	4218793	4031079	8249872	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%
15-19	4702325	4355705	9058031	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%
65-69	991280	991713	1982993	-2%	2%
70-74	686881	703725	1390607	-1%	2%
75-79	360216	379551	739767	-1%	1%
80+	406536	477025	883561	-1%	1%
Total	46745275	44418389	90725906	-100%	100%



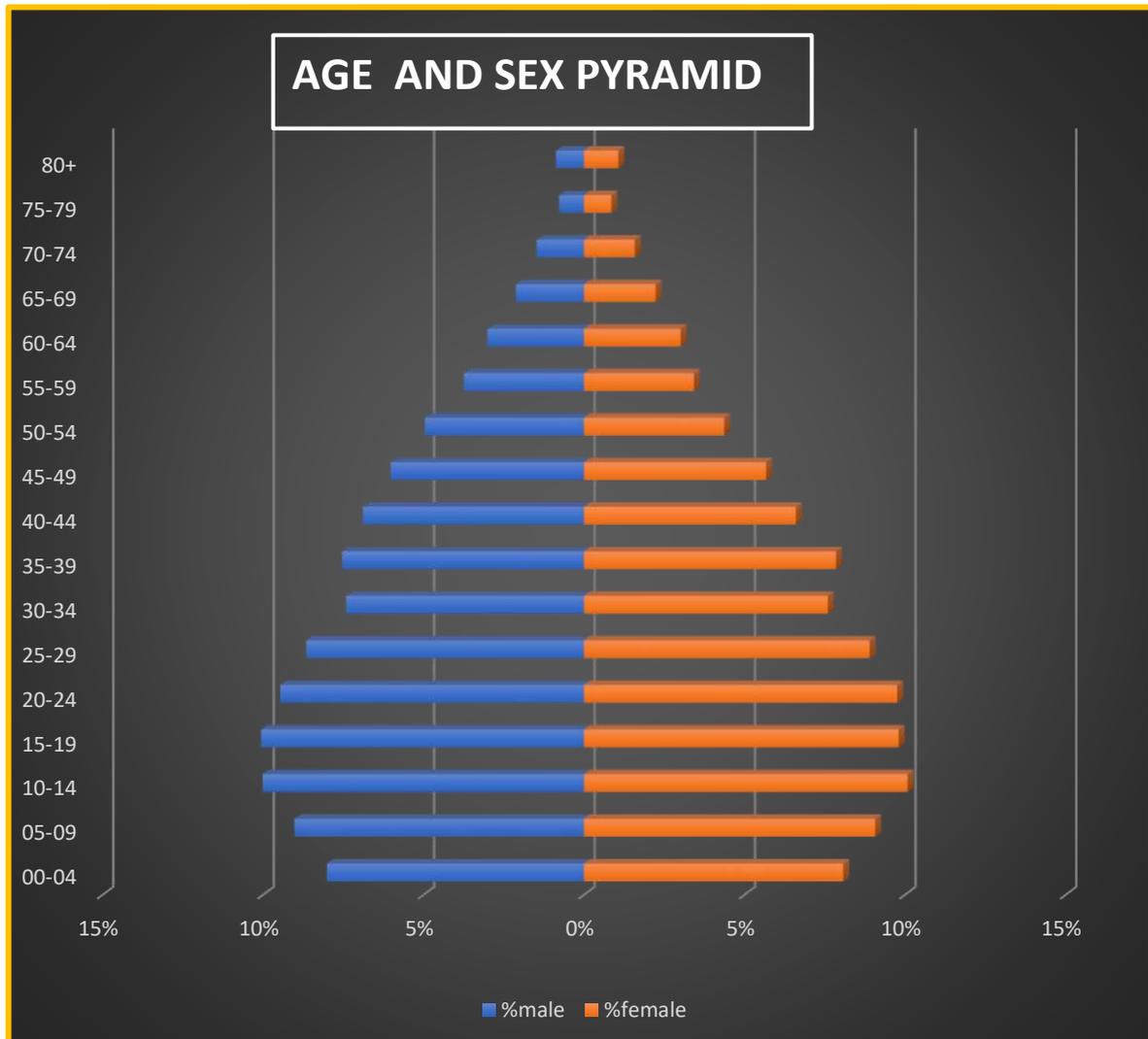
5. After your age and sex pyramid was appear then you have to remove [-] Portion from the horizontal plane → right click on it → then format axis.



6. Then this type of tool box was open > go to number> click on customs.



AGE SEX PYRAMID



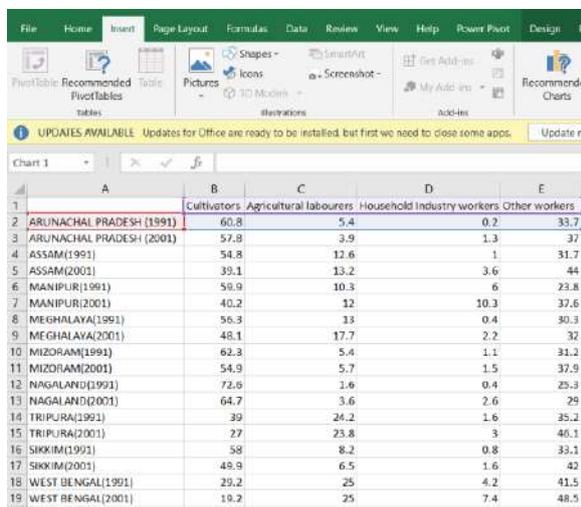
Occupational Structure

What is Occupational Structure?

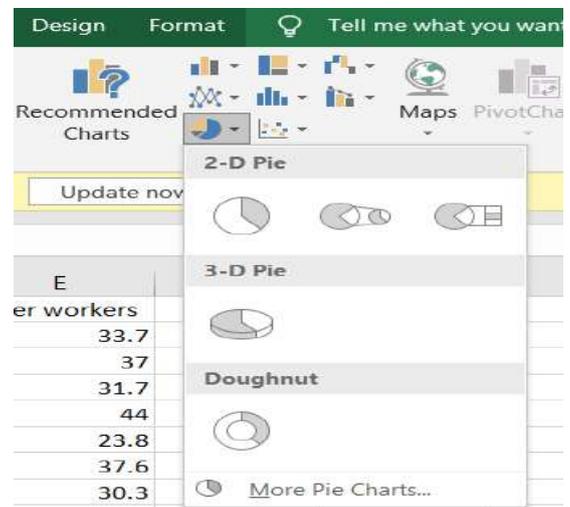
The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a country who are employed in different sectors like agriculture, manufacturing and transport, among many others constitute the occupational structure of a nation.

Steps for occupational structure:

1. At first add the data on excel sheet.
2. Now select the data according to your choice → go to Insert → select recommended charts and click 3a-D Pie → ok.

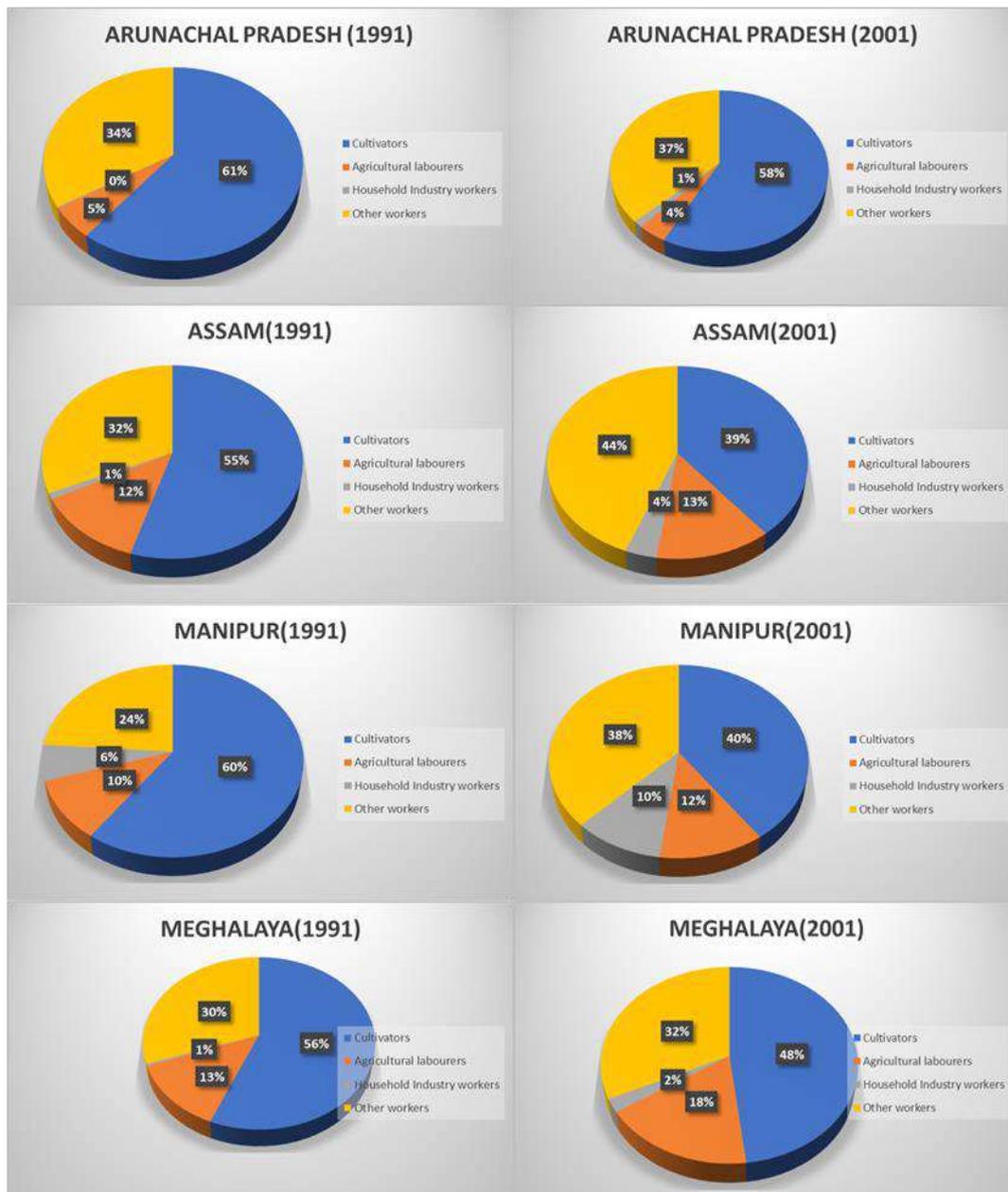


	A	B	C	D	E
1		Cultivators	Agricultural labourers	Household Industry workers	Other workers
2	ARUNACHAL PRADESH (1991)	60.8	5.4	0.2	33.7
3	ARUNACHAL PRADESH (2001)	57.8	3.9	1.3	37
4	ASSAM(1991)	54.8	12.6	1	31.7
5	ASSAM(2001)	39.1	13.2	3.6	44
6	MANIPUR(1991)	59.9	10.3	6	23.8
7	MANIPUR(2001)	40.2	12	10.3	37.6
8	MEGHALAYA(1991)	56.3	13	0.4	30.3
9	MEGHALAYA(2001)	48.1	17.7	2.2	32
10	MIZORAM(1991)	62.3	5.4	1.1	31.2
11	MIZORAM(2001)	54.9	5.7	1.5	37.9
12	NAGALAND(1991)	72.6	1.6	0.4	25.3
13	NAGALAND(2001)	64.7	3.6	2.6	29
14	TRIPURA(1991)	39	24.2	1.6	35.2
15	TRIPURA(2001)	27	23.8	3	46.1
16	SIKKIM(1991)	58	8.2	0.8	33.1
17	SIKKIM(2001)	49.9	6.5	1.6	42
18	WEST BENGAL(1991)	29.2	25	4.2	41.5
19	WEST BENGAL(2001)	19.2	25	7.4	48.5

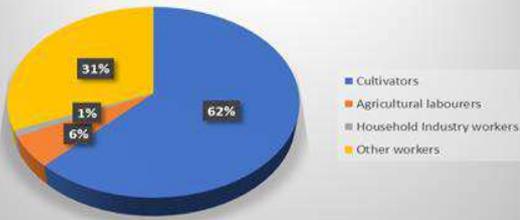


3. After that select the pie diagram → then copy and paste the diagram and merge → save as image → ok.

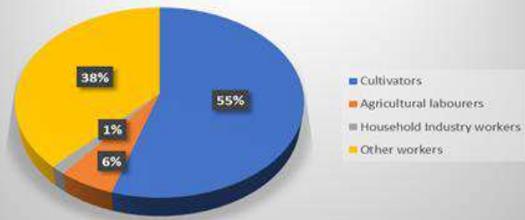
OCCUPATIONAL STRUCTURE DIAGRAM



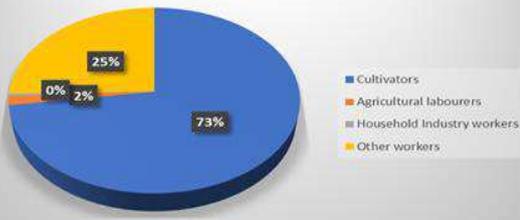
MIZORAM(1991)



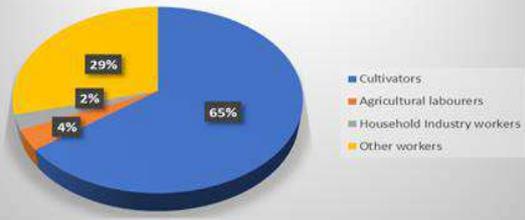
MIZORAM(2001)



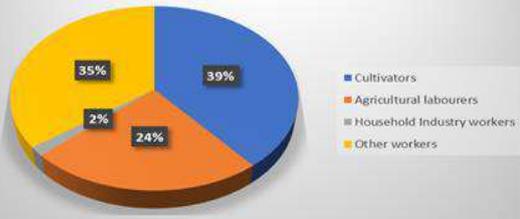
NAGALAND(1991)



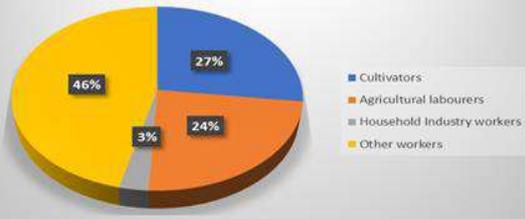
NAGALAND(2001)



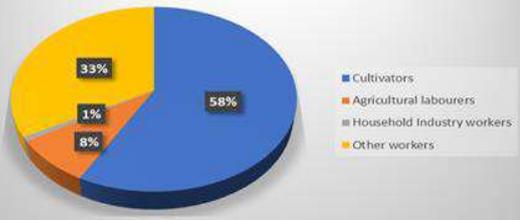
TRIPURA(1991)



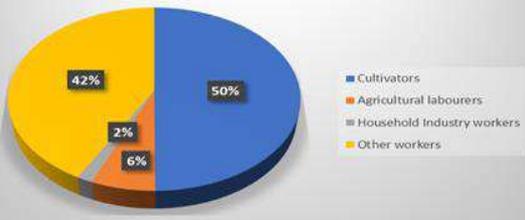
TRIPURA(2001)



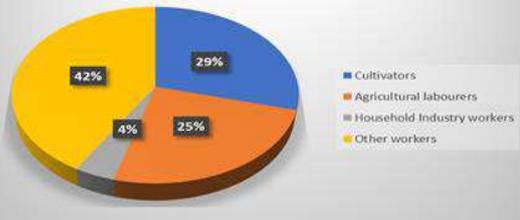
SIKKIM(1991)



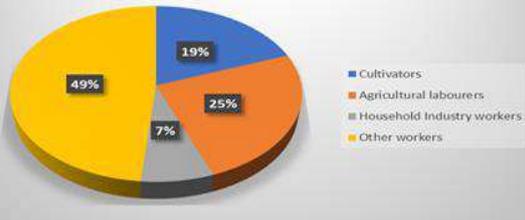
SIKKIM(2001)



WEST BENGAL(1991)



WEST BENGAL(2001)



MIGRATION

Migration is the progress of people from one place to another, to establish their permanent or semi-permanent residence at the destination. Immigration is an essential component of change, structure, and population growth, as are birth rates and mortality.

There are attraction factors and pushing factors in one place, which influence a person's decision to move. The first are those that attract people to stay, such as low crime rates, pleasant weather, political stability, and excellent employment opportunities. Push factors encourage people to leave the place, such as poverty, war, and floods. Migration is usually voluntary, but there are many specific reasons why a person can do it. Sometimes it is forced. Immigration has been a widespread phenomenon throughout the history of humanity; However, nomadic movements are non-migratory, since their purpose is not to settle permanently or semi-permanently in one place. Nor are tourist trips, pilgrimages, and other actions that do not have this end.

Causes:

The causes vary, from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area. The roots of [migration] are the following:

Economic: Seek employment, start or continue a career, in particular, take advantage of the economic benefits of a specific country, and so on.

Social: Stay close or live with the family, seek a better quality of lifestyle, and so on.

Policies: From persecutions, wars, and other types of problems or political conflicts that put lives at risk.

Cultural: Improve the quality of education, seek religious affinity or tolerance, taste for the culture of the country, and so on.

Environmental: Escape from natural disasters, find a place with a more pleasant climate, and so on.

TYPES OF MIGRATION:

1.Internal migration:

Internal migration is a migration that takes place within the borders of a country or territory;

2. External or international migration:

migration is international when it refers to changes in habitual residence between countries.

3."lifetime" migration:

The "lifetime" migration is defined by relating the place of birth and the place of residence to a reference date. The migrant "life-time" is any individual who resides in an administrative entity other than his or her place of birth.

4.Migratoire flows:

Migration flows refer to movements (in and out) of population (nationals and foreigners) that occur at the borders of a given country.

5.Stock of migrants:

Migrant stocks are referred to as the number of migrants (immigrants and emigrants) residing in a country with a certain length of stay, irrespective of the socioeconomic characteristics (migrant workers, refugees, students, etc.) of migrants.

6.Diaspora:

A diaspora is defined both as the dispersion of a people in foreign countries and the formation of a community of that people in those countries.

7.Clandestine/irregular migration:

There is "clandestine migration" when an foreigner enters a country without respecting the entry conditions or has entered illegally, remains there beyond the time allowed by law.

LAND USE AND LAND COVER MAPS

The terms land use and land cover are often used interchangeably, but each term has its own unique meaning. Land cover refers to the surface cover on the ground like vegetation, urban infrastructure, water, bare soil etc. Identification of land cover establishes the baseline information for activities like thematic mapping and change detection analysis. Land use refers to the purpose the land serves, for example, recreation, wildlife habitat, or agriculture.

When used together with the phrase Land Use / Land Cover (LULC) generally refers to the categorization or classification of human activities and natural elements on the landscape within a specific time frame based on established scientific and statistical methods of analysis of appropriate source materials. Land cover is the physical material at the surface of the earth. Land use is the description of how people utilize the land for the socio-economic activities.

Reason to use Land use and Land cover maps: -

- LULC maps play a significant and prime role in **planning, management and monitoring programmes** at local, regional and national levels. This type of information, on one hand, provides a better understanding of **land utilization aspects** and on the other hand, it plays an important role in **the formation of policies and programme required for development planning**.
- For ensuring sustainable development, it is necessary to **monitor the on-going process on land use/land cover** pattern over a period of time.
- **In order to achieve sustainable urban development** and to **check the haphazard development** of towns and cities, it is necessary that authorities associated with the urban development generate such planning models so that every bit of available land can be used in most rational and optimal way.
- LULC maps also help us to **study the changes** that are happening in our ecosystem and environment and **we can make policies and launch programmes to save our environment**.

LULC classification: -

LULC classification is one of the most widely used applications in remote sensing. The most commonly used approaches include:

Unsupervised classification, Supervised classification, **Image** segmentation, NDVI

Applications of LULC maps: -

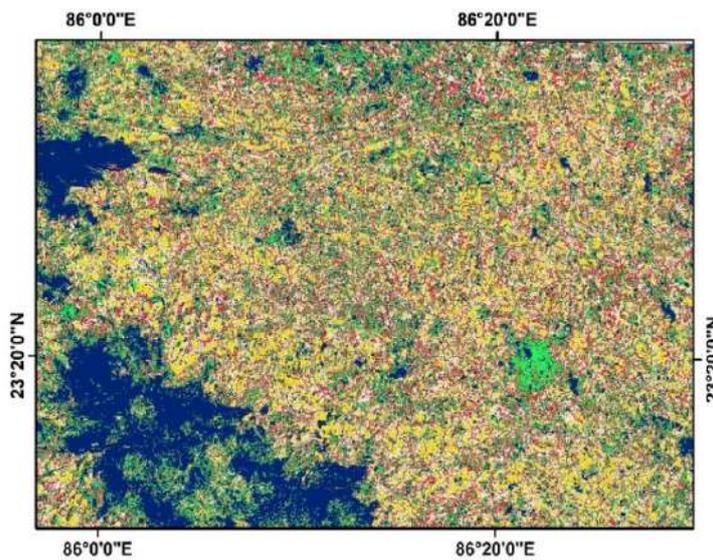
- Natural resource management
- Wildlife habitat protection
- Baseline mapping for GIS input
- Urban expansion / encroachment
- Routing and logistics planning for seismic / exploration/resource extraction activities
- Damage delineation (tornadoes, flooding, volcanic, seismic, fire)
- Legal boundaries for tax and property evaluation. Target detection - identification of landing strips, roads, clearings, bridges, land/water interface.

Steps to create Land use and Land cover Maps: -

Data downloading → Downloading vector data → Downloading ESA Global land cover dataset → Data pre-processing → loading vector data into QGIS → Extracting shape file for chosen area → Adding ESA land cover data to QGIS → clipping ESA Gloal land cover dataset → Data preparation → Install SCP Plugin in QGIS → QGIS Install Plugin Window → SCP Dock → Import Data → Select Directory SCP Plugin → Creating a Bandset → SCP Bandset Page → SCP Plugin Bandset window with the single band list loaded → Pixel information for each band → Area image before changing band rendering → Create training input → Create classes → Change Band Rendering → Create RIOs → Assess ROIs → Spectral Signature Plot → Run classification → Ground cover classification → SCP land cover change outputs → Layer Properties, Symbology → Land cover change output map.

LAND USE AND LAND COVER MAP

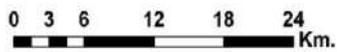
Preparation of a simple landuse map



Legend

Landuse categories

-  Reservoir
-  Vegetation
-  Settlement
-  Marshy land
-  Agricultural land



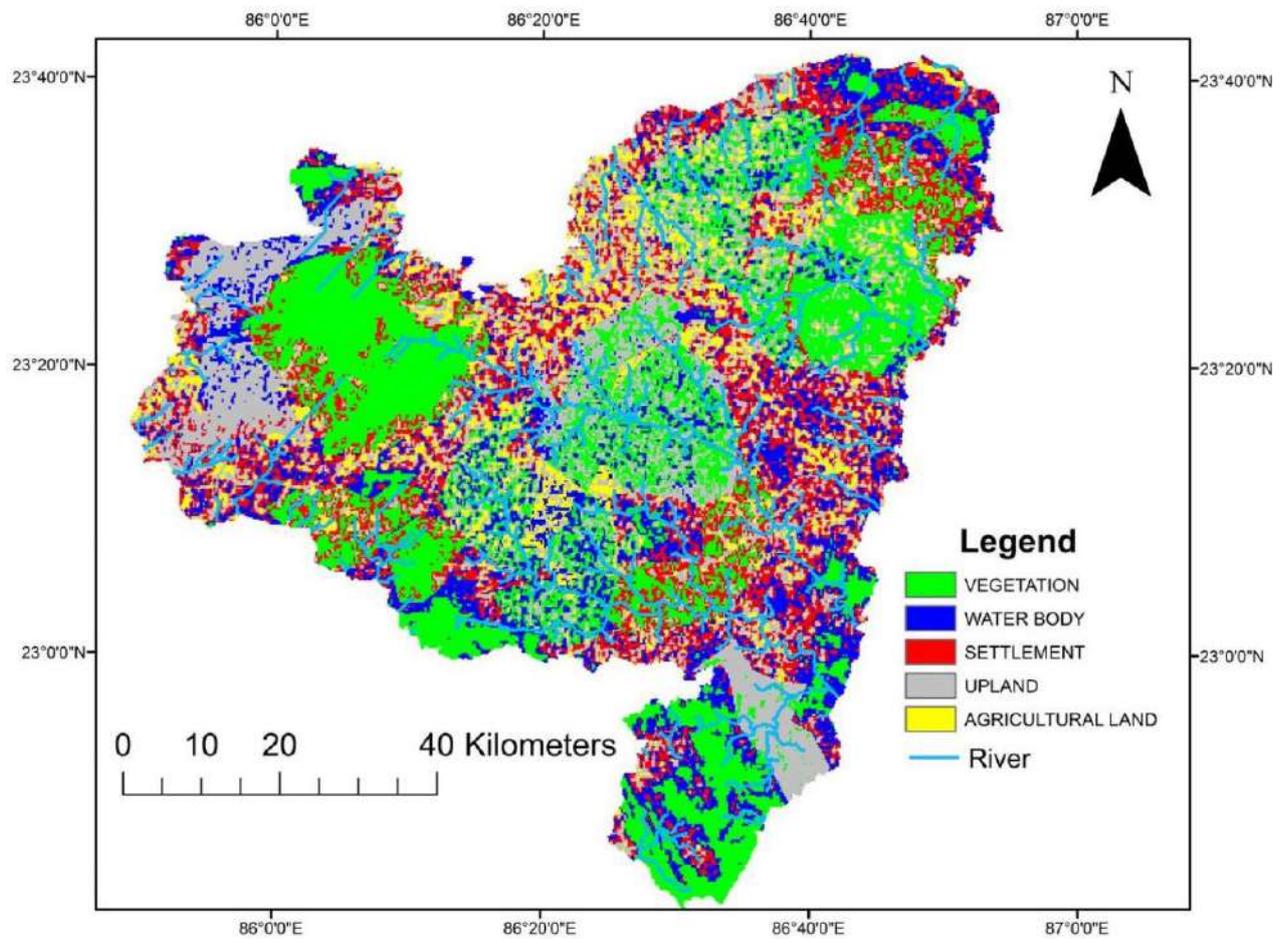
Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation: -

Here in this land use map, there is a reservoir in the north-east side of the area, which is indicated by blue. We can notice, most of this area is covered by agricultural land, which is highlighted by yellow. There are some vegetation in this area which is covered with green. In this area we can see settlement with medium density as red colour. There are marshy land which is noticed very often and this is noticed as grey colour.

We can get a land use and land cover map of Purulia district.

LANDUSE MAP OF PURULIA DISTRICT (2019)

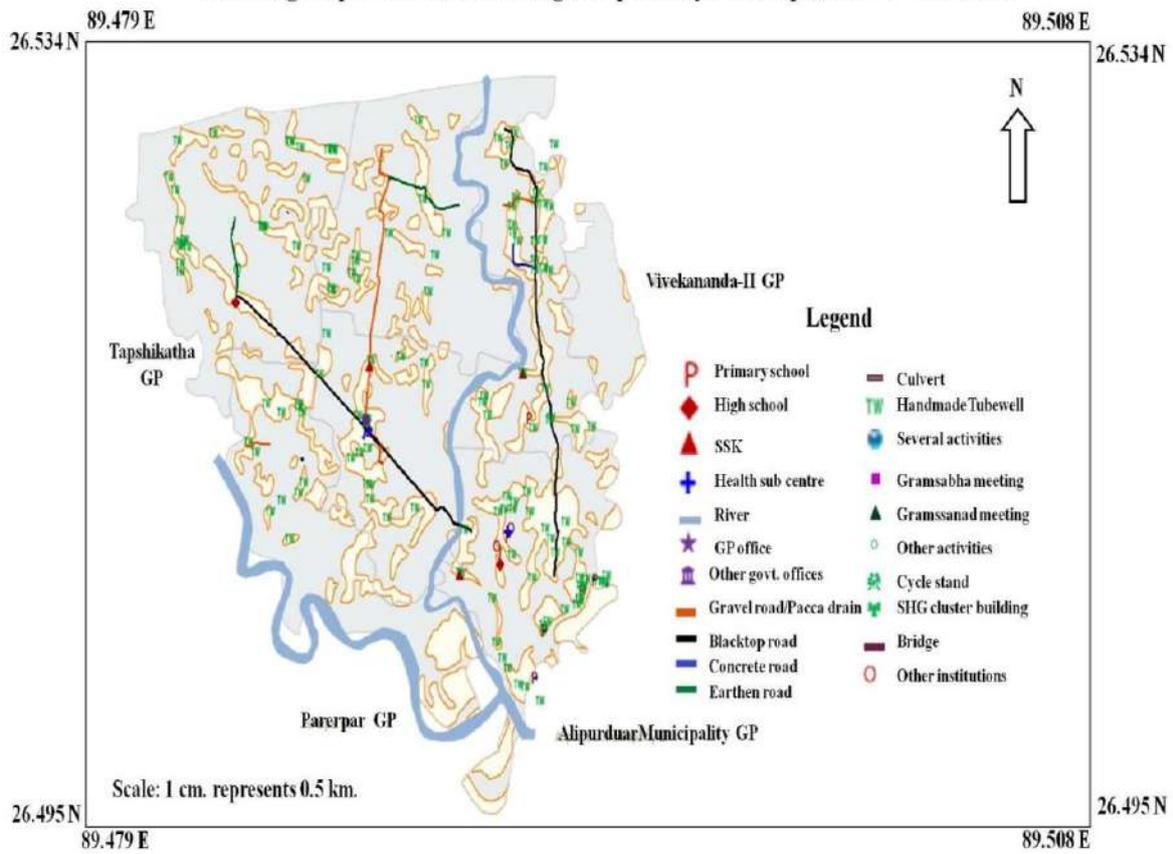


Interpretation: -

In this land use map, there are vegetation in northern part and also in east and north-east, middle side of Purulia, which is high in density and indicated as green. We can noticed reticulated river which is flow from north to east and also some tributary river in the northern side of Purulia district, the river is mentioned by sky blue. There are agricultural land in all over the area of this locality and is highlighted by yellow. In the northern side and eastern side there are upland which is mentioned as grey. There are dense settlement pattern all over the area of Purulia district, this is highlighted in red colour. There are thick water body in north and east part of the area and also some water body can noticed all over the area of this map. The water body is indicated by deep blue.

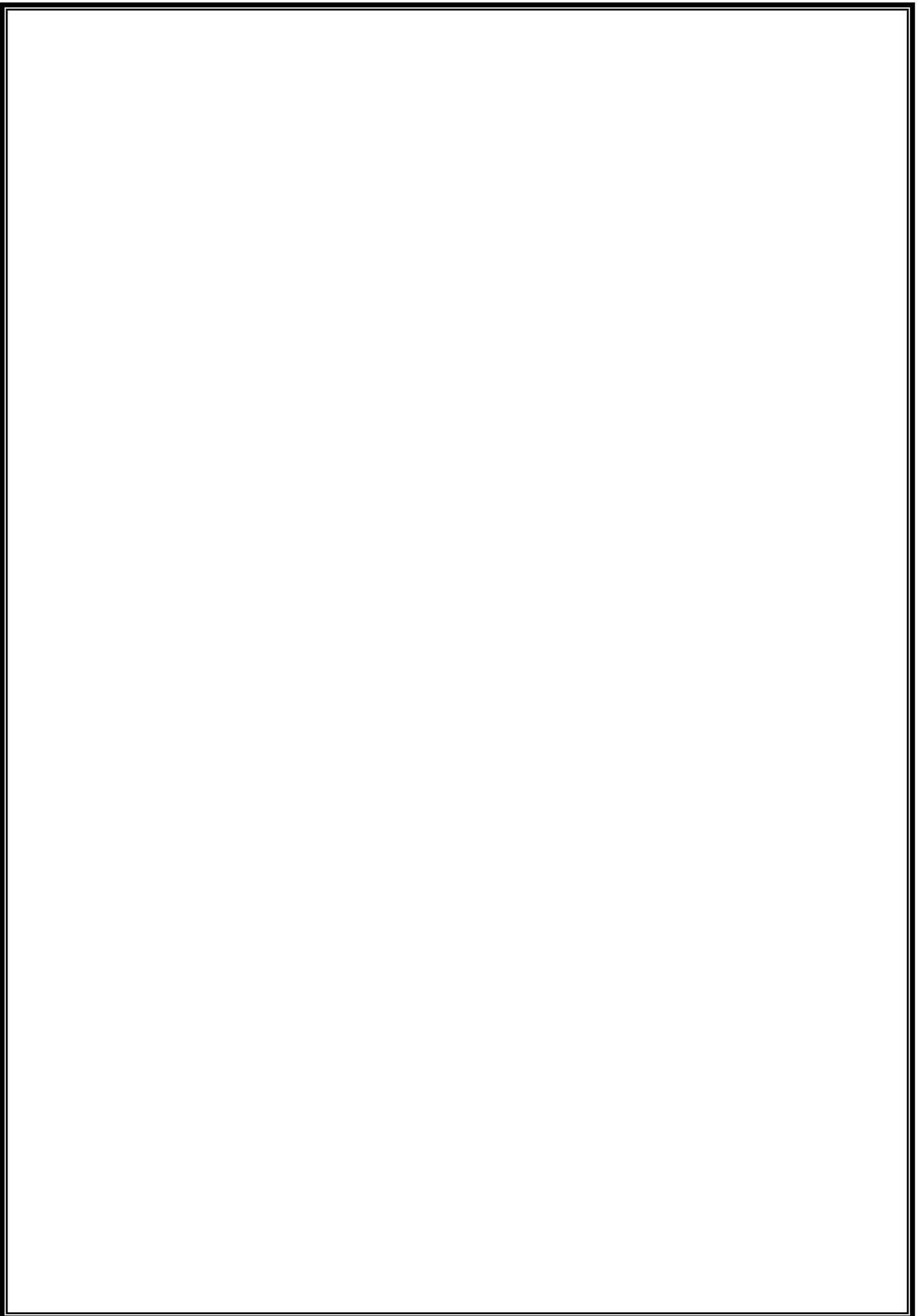
PLANNING MAP OF ALIPURDUAR-I C.D. BLOCK

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation: -

In this planning map of Banchukumari gram panchayet of Alipurduar, we can see a river running from north to east and a tributary river is joined from north-east side of the area. There are four primary school in the east corner. Also there are two high schools and two SSK, health centre, GP office, other government office in the same direction. So we can say that many of these official buildings, education and health sector is located in the east corner of this area. In this block there have pacca drain and gravel road in the middle portion of the area. There are two blacktop road in the middle and east part of this block. Each locality have there own handmade tubewell. There are concrete road in the north and north-east side of this block.



NAME – IPSITA DUTTA

ROLL-BGC/MGF/SIV/21 NO. – 319

REGISTRATION NUMBER - 1071921401424

PG 4TH SEM GEOGRAPHY

BHAIRAB GANGULY COLLEGE

**SUBJECT – REGIONAL PLANNING AND
RURAL DEVELOPMENT PRACTICAL**

CODE – GEOPDSE04P

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RURAL RESEARCH METHOD AND METHODOLOGY

PRE-FIELD ISSUES ON RURAL RESEARCH

Definition of Research

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.”

Inductive research methods analyse an observed event, while deductive methods verify the observed event. Inductive approaches are associated with [qualitative research](#), and deductive methods are more commonly associated with quantitative analysis.

Research is conducted with a purpose to:

- Identify potential and new customers
- Understand existing customers
- Set pragmatic goals
- Develop productive market strategies

Characteristics of Research

1. Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
2. The analysis is based on logical reasoning and involves both inductive and deductive methods.
3. Real-time data and knowledge is derived from actual observations in natural settings.
4. It creates a path for generating new questions. Existing data helps create more research opportunities.
5. It is analytical and uses all the available data so that there is no ambiguity in inference.

Types of Research Methods and example

Research methods are broadly classified as Qualitative and Quantitative.

- [Qualitative methods](#)

Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Types of qualitative methods include

- A. One-to-one Interview
- B. Focus Groups
- C. Ethnographic studies
- D. Text Analysis
- E. Case Study
- [Quantitative methods](#)

Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to explain, predict, or control a phenomenon.

Types of quantitative methods include:

- A. Survey research
- B. Descriptive research
- C. Correlational research

It is essential to ensure that data should be:

- I. Valid – founded, logical, rigorous, and impartial.
- II. Accurate – free of errors and including required details.
- III. Reliable – other people who investigate in the same way can produce similar results.
- IV. Timely – current and collected within an appropriate time frame.
- V. Complete – includes all the data you need to support your business decisions.

LITREATURE SEARCH ON RESEARCH

Literature search is a systematic and well-organised search from the already published data to identify a breadth of good quality references on a specific topic. The reasons for conducting literature search are numerous that include drawing information for making evidence-based guidelines, a step in the research method and as part of academic assessment. However, the main purpose of a thorough literature search is to formulate a research question by evaluating the available literature with an eye on gaps still amenable to further research. Research problem is typically a topic of interest and of some familiarity to the researcher. It needs to be channelized by focussing on information yet to be explored. Once we have narrowed down the problem, seeking and analysing existing literature may further straighten out the research approach. A research hypothesis is a carefully created testimony of how you expect the research to proceed. It is one of the most important tools which aid to answer the research question. It should be apt containing necessary components, and raise a question that can be tested and investigated.

select the databases you will use to conduct your searches.

Make a list of the databases you will search.

Where to find databases:

- Find Databases by Subject

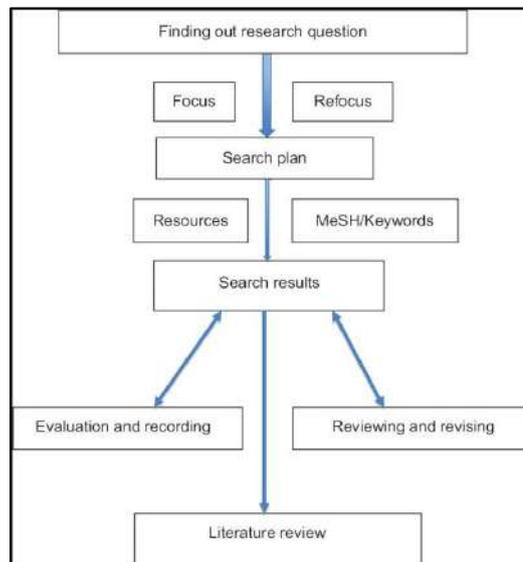
UWF Databases categorized by discipline

- Find Databases via Research Guides

Librarians create research guides for all of the disciplines on campus! Take advantage of their expertise and see what discipline-specific search strategies they recommend!

Conduct your searches and find the literature. Keep track of your search

- I. Review the abstracts of research studies carefully. This will save you time.
- II. Write down the searches you conduct in each database so that you may duplicate them if you need to later (or avoid dead-end searches that you'd forgotten you'd already tried).
- III. Use the bibliographies and references of research studies you find to locate others.
- IV. Ask your professor or a scholar in the field if you are missing any key works in the field.
- V. Use Ref Works to keep track of your research citations. See the Ref Works Tutorial if you need help.



Process of literature search

SELECTING STUDY AREA AND TARGET POPULATION

- **STUDY AREA**

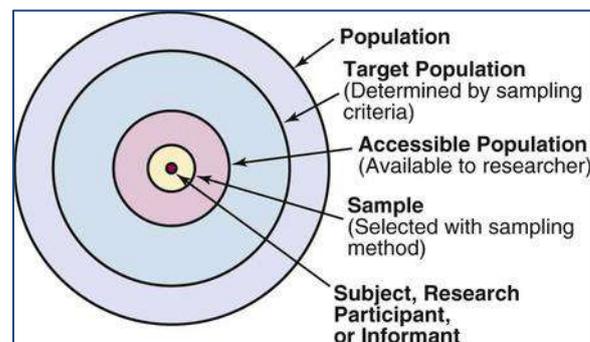
An area of land chosen or available as an object of study, especially with regard to the animal or plant life in it.

A subject area chosen or allocated for study.

- **TARGET POPULATION**

Also known as target audience, this term refers to a group of people that possess certain attributes that can be classified properly to separate them from the entire population. The purpose of this technique is to understand and evaluate their preferences and behaviours in order to market a given product or service or to study a given element that appears among them like behaviour patterns. It is a concept that relates with market segmentation strategies employed by companies.

For example, a given company can identify its target population as women between 21 and 35 years old living in certain geographical location. Nevertheless, this is still a broad target that will have very distinctive needs. In order to homogenize their needs properly, the target must be narrowed, which is the job of market segmentation. By employing demographic and psychographic analysis to identify particular clusters among this initial target, companies can establish market segments that they can serve more adequately, employing different strategies to reach each of them.



IDENTIFYING AND COLLECTING SECONDARY DATA

Secondary Data

Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, and then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

Sources of Secondary Data

Sources of secondary data include books, personal sources, journal, newspaper, website, government record etc. Secondary data are known to be readily available compared to that of primary data. It requires very little research and need for manpower to use these sources.

Some of these sources are highlighted below:

- **Books** - Books are one of the most traditional ways of collecting data. Today, there are books available for all topics you can think of. When carrying out research, all you have to do is look for a book on the topic being researched on, then select from the available repository of books in that area. Books, when carefully chosen are an authentic source of authentic data and can be useful in preparing a literature review.
- **Published Sources** - There are a variety of published sources available for different research topics. The authenticity of the data generated from these sources depends majorly on the writer and publishing company. Published sources may be printed or electronic as the case may be. They may be paid or free depending on the writer and publishing company's decision.
- **Unpublished Personal Sources** - This may not be readily available and easily accessible compared to the published sources. They only become accessible if the researcher shares with another researcher who is not allowed to share it with a third party. **For example**, the product management team of an organization may need data on customer feedback to assess what customers think about their product and improvement suggestions. They will need to collect the data from the customer service department, which primarily collected the data to improve customer service.
- **Journal** - Journals are gradually becoming more important than books these days when data collection is concerned. This is because journals are updated regularly with new publications on a periodic basis, therefore giving to date information. Also, journals are usually more specific when it comes to research. For example, we can have a journal on, "Secondary data collection for quantitative data" while a book will simply be titled, "Secondary data collection".
- **Newspapers** - In most cases, the information passed through a newspaper is usually very reliable. Hence, making it one of the most authentic sources of collecting secondary data. The kind of data commonly shared in newspapers is usually more political, economic, and educational than scientific. Therefore, newspapers may not be the best source for scientific data collection.
- **Websites** - The information shared on websites are mostly not regulated and as such may not be trusted compared to other sources. However, there are some regulated websites that only share authentic data and can be trusted by researchers. Most of these websites are usually government websites or private organizations that are paid, data collectors.

PREPARING A QUESTIONNAIRE

Questionnaires are of many types as they may serve various purposes. Generally, a questionnaire is used to gain feedback from a given respondent. A questionnaire is considered to be effective if it has the ability to garner reliable information from the people who willingly answer them. It is an important tool of sampling.

Types : A distinction can be made between questionnaires with questions that measure separate variables, and questionnaires with questions that are aggregated into either a scale or index. Questionnaires with questions that measure separate variables, could for instance include questions on:

- Preferences
- Behaviours
- Facts

Questionnaires with questions that are aggregated into either a scale or index, include for instance questions that measure:

- Latent traits
- Attitudes
- An index

Data Analysis, Questionnaire and Survey

A questionnaire is any written set of questions, while a survey is both the set of questions and the process of collecting, aggregating, and analysing the responses from those questions. In other words, “questionnaire” describes content, while “survey” is a broader term that describes content, method, and analysis.

The confusion between these terms most likely stems from the fact that questionnaires and data analysis were treated as very separate processes back in the day. Questionnaires used to be completed on paper, and data analysis occurred later on if desired. Nowadays, these processes are typically combined since online survey tools allow for questionnaires to immediately produce data.

However, questionnaires can still be used for reasons other than data analysis. Job applications and medical history forms, among others, are examples of questionnaires that have no intention of being statistically analysed. This is the key difference between questionnaires and surveys — they can exist together or separately, but when together, a questionnaire is a tool used in a survey.

- **Identify a theme.** With a theme, you can specify what data needs to be gathered and how these may be acquired in the form of a question.
- **Ask simple questions.** Be as specific as possible. Your respondents need to be able to answer each question without much deliberation.
- **Ask the same question in different ways.** There’s always a chance that your respondent may be answering the questionnaire absentmindedly. To assess the reliability of such response, ask the same question several times but in different ways.

- **Choose a delivery method.** If you want to reach a wider audience, you can distribute your questionnaires through various social networks.

SIMILARITIES BETWEEN QUESTIONNAIRES AND SCHEDULES

- Both are set of related items having questions relating to a central problem.
- Both use mainly structured questions and these questions are so phased and interlocked that they have a built-in mechanism for testing the reliability and validity of the response.
- In both the same set of questions is administered to all the respondents and comparable results are obtained.
- Both these instruments have to be used with the same general principles of designs and have to take into account the same problems and basic difficulties they have to be limited in length.
- In both, the central problem has to be concentrated upon the following considerations involved in the problem of evolving the questionnaire and a schedule as a unit.
- Drawing the respondent into a situation through awake and interest.
- Proceeding from simple to complex questions.
- No early and sudden request for information of a personal and embracing intimate nature.
- Not asking embarrassing questions without giving the respondent an opportunity to explain himself.
- Moving smoothly from one item to another.
- In both certain types of questions have to be eliminated such as vague and ambiguous questions, emotionally charged questions, loaded and leading questions, questions eliciting no response and questions having a structured response to the queries, violence to the existing facts.
- In both pilot studies and pre-tests are necessary for formulating the instrument and for bringing them to the final form. They have to go through the same stages of development

HYPOTHESIS TESTING

Hypothesis testing is an act in statistics whereby an analyst [tests](#) an assumption regarding a population parameter. The methodology employed by the analyst depends on the nature of the data used and the reason for the analysis.

Hypothesis testing is used to assess the plausibility of a hypothesis by using sample data. Such data may come from a larger population, or from a data-generating process. The word "population" will be used for both of these cases in the following descriptions.

The Testing Process

In the statistics literature, statistical hypothesis testing plays a fundamental role. There are two mathematically equivalent processes that can be used.

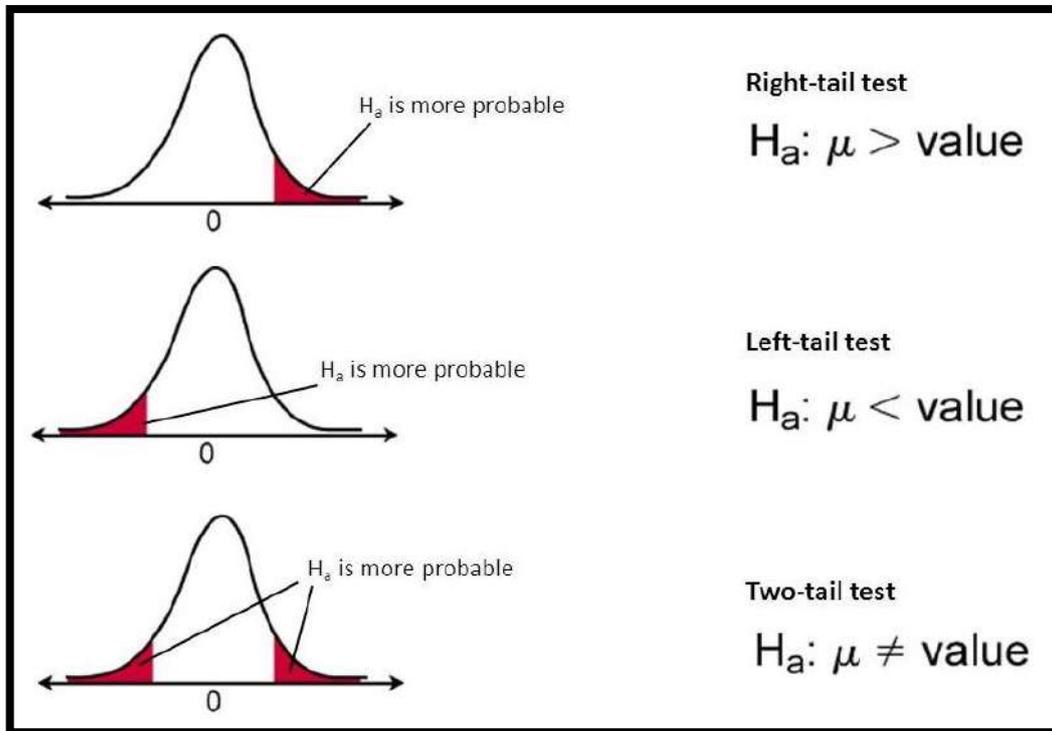
The usual line of reasoning is as follows:

1. There is an initial research hypothesis of which the truth is unknown.
2. The first step is to state the relevant **null** and **alternative hypotheses**. This is important, as mis-stating the hypotheses will muddy the rest of the process.
3. The second step is to consider the [statistical assumptions](#) being made about the sample in doing the test; for example, assumptions about the [statistical independence](#) or about the form of the distributions of the observations. This is equally important as invalid assumptions will mean that the results of the test are invalid.
4. Decide which test is appropriate, and state the relevant [test statistic](#) T .
5. Derive the distribution of the test statistic under the null hypothesis from the assumptions. In standard cases this will be a well-known result. For example, the test statistic might follow a [Student's t distribution](#) with known degrees of freedom, or a [normal distribution](#) with known mean and variance. If the distribution of the test statistic is completely fixed by the null hypothesis we call the hypothesis simple, otherwise it is called composite.
6. Select a significance level (α), a probability threshold below which the null hypothesis will be rejected. Common values are 5% and 1%.
7. The distribution of the test statistic under the null hypothesis partitions the possible values of T into those for which the null hypothesis is rejected—the so-called *critical region*—and those for which it is not. The probability of the critical region is α . In the case of a composite null hypothesis, the maximal probability of the critical region is α .
8. Compute from the observations the observed value t_{obs} of the test statistic T .
9. Decide to either reject the null hypothesis in favor of the alternative or not reject it. The decision rule is to reject the null hypothesis H_0 if the observed value t_{obs} is in the critical region, and not to reject the null hypothesis otherwise.

A common alternative formulation of this process goes as follows:

1. Compute from the observations the observed value t_{obs} of the test statistic T .
2. Calculate the [p-value](#). This is the probability, under the null hypothesis, of sampling a test statistic at least as extreme as that which was observed (the maximal probability of that event, if the hypothesis is composite).

- Reject the null hypothesis, in favor of the alternative hypothesis, if and only if the p -value is less than (or equal to) the significance level (the selected probability) threshold (α)



Errors in Hypothesis Testing

In statistical hypothesis testing, a **type I error** is the mistaken rejection of the null hypothesis (also known as a "false positive" finding or conclusion; example: "an innocent person is convicted"), while a **type II error** is the mistaken acceptance of the null hypothesis (also known as a "false negative" finding or conclusion; example: "a guilty person is not convicted"). Much of statistical theory revolves around the minimization of one or both of these errors, though the complete elimination of either is a statistical impossibility if the outcome is not determined by a known, observable causal process. By selecting a low threshold (cut-off) value and modifying the alpha (p) level, the quality of the hypothesis test can be increased. The knowledge of Type I errors and Type II errors is widely used in medical science, biometrics and computer science.

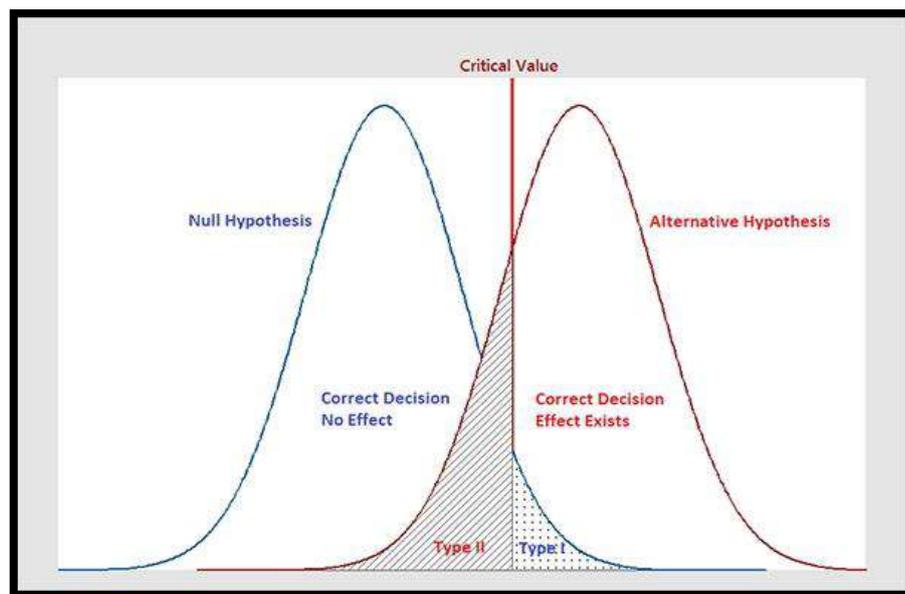
Type I error

A Type I error means rejecting the null hypothesis when it's actually true. It means concluding that results are **statistically significant** when, in reality, they came about purely by chance or because of unrelated factors.

The risk of committing this error is the significance level (alpha or α) you choose. That's a value that you set at the beginning of your study to assess the statistical probability of obtaining your results (*p* value).

The significance level is usually set at 0.05 or 5%. This means that your results only have a 5% chance of occurring, or less, if the null hypothesis is actually true.

If the *p* value of your test is lower than the significance level, it means your results are statistically significant and consistent with the alternative hypothesis. If your *p* value is higher than the significance level, then your results are considered statistically non-significant.



Type II error

A Type II error means not rejecting the null hypothesis when it's actually false. This is not quite the same as “accepting” the null hypothesis, because hypothesis testing can only tell you whether to reject the null hypothesis.

Instead, a Type II error means failing to conclude there was an effect when there actually was. In reality, your study may not have had enough **statistical power** to detect an effect of a certain size.

Power is the extent to which a test can correctly detect a real effect when there is one. A power level of 80% or higher is usually considered acceptable.

The risk of a Type II error is inversely related to the statistical power of a study. The higher the statistical power, the lower the probability of making a Type II error

Differences between Questionnaires and Schedules

Character	Questionnaire	Schedule
Delivered by	In general, questionnaires are delivered to the persons concerned either by post or mail, requesting them to answer the questions and return it.	Enumerators go to the informants with the schedule.
Role of Respondents	Read and understand the questions and reply in the space provided in the questionnaire itself.	Only answer the questions asked by enumerators. Sometimes, the schedule is distributed to the respondents, and the enumerators assist them in answering the questions.
Filled by	Respondents	Enumerators
Response Rate	Low	High
Coverage	Large	Comparatively small
Cost	Economical	Expensive
Respondent's identity	Not known	Known
Observation Method	Not applicable	Applicable

ISSUES ON FIELD RESEARCH

PILOT STUDY BASED ON QUESTIONNAIRE:

The term 'piloting' refers to testing various aspects of the survey, and includes a test of the questionnaire. ... Piloting of a questionnaire is the process of testing a questionnaire on a small sample of respondents to assist us in identifying both potential problems as well as possible solutions.

For example, it may be used to test a questionnaire, to ascertain the time taken by field procedure or to determine the most effective size of sampling unit.

STEPS TO WRITE A PILOT BASED QUESTIONNAIRE-

Implement all the steps from start to finish

Start by training your data collectors, if you have them. Then distribute and collect the survey exactly as you would in practice. Enter the completed surveys into the database that you plan to use and then test the analysis that you plan to perform.

survey steps

Selecting the sample

1. **Identify your target group.** Ideally, the sample you use to pilot your questionnaire should be members of the same group that you intend to target for the full study. Define your target group in terms of age, gender, geographic location, and any other factors relevant to your study.
2. **Choose 5 to 10 people to test.** Your sample doesn't have to be tremendously large for you to get a good sense of whether the questionnaire and your methods of administering the questionnaire are going to be effective.
3. **Look for similarly situated people.** In some cases, it won't be possible to pull a sample group directly from the actual target group for your study. Look at the description of your target group and search for similar people.
4. **Cover the range of your target group.** Particularly if you're conducting a large survey, you want to make sure each subgroup of your overall target group has a chance to be part of the pilot. You want to make sure different subgroups still understand the questions the same way.
5. **Do as much as you can.** You may not have the time or resources to do a larger pilot of your questionnaire before you start using it for your study. When time or resources are limited, you should still try to go through the questionnaire with at least one person.

□ **Completing the Questionnaire**

1. **Train your data collectors.** If you're going to pilot a questionnaire, it's important that the questionnaire is administered to the testers the same way you intend to administer it to the target group.
2. **Invite testers one at a time.** When you pilot a questionnaire, you won't have very many testers in your sample. If they take the questionnaire separately you have the opportunity to focus on each individual.
3. **Observe the testers answering the questions.** While you'll be asking your pilot testers directly about their experience completing your questionnaire, you'll get a lot of uncensored information from studying their body language.
4. **Solicit additional feedback.** As soon as possible after each sample tester completes your questionnaire, sit down and have an interview with them to find out more about their experience responding to your questionnaire.

□ **Make improvements**

Assuming that the survey was pretested, piloting will normally identify practical problems with implementation, rather than problems with the survey design. For example, lack of staff training, challenges with the logistics of distributing and collecting the survey, or errors in data entry. These can then be fixed before you do the actual survey.

ETHNOGRAPHIC FIELD DIARY

Ethnographic research involves the study of people in situ. It involves the study of informants, their actions and their activities as they occur. Such an approach presupposes that the researcher can gain access to informants and their activities.

Ethnographic data is collected in a variety of ways that involve the researcher being embedded in the field in a variety of ways. Ethnographers collect data by observing in the field. This includes both structured and unstructured observations, along with participant observations.

An ethnographer may spend days, months or even years in one field site to observe and interview research subjects. A field site is the location or environment an ethnographer is studying. It can be virtually any place—a school, workplace, community, home, street, and even in the online world. This triangulation of ethnographic methods—using a variety of methods in a field site—helps the researcher to gather as much data as possible to identify trends, patterns and nuances of the field they are studying.

To write a basic ethnography you need these five essential parts:

- A. **A thesis.** The thesis establishes the central theme and message of your research study. This will help organize your paper and integrate it around a single major idea. It will also help the reader to identify the importance of the cultural pattern you have studied. It can be one to two sentences long.

- B. **Literature Review.** A literature review is an analysis of previous research now on your research topic. This will help you gather background information to enable better understanding of the significance about your research topic. Within your analysis of each article you must examine the topic of study, research methods, research results, strengths and weaknesses, and how your research study will contribute to this research. Depending on the desired length of your ethnography, you should include one to five research articles on your research topic.
- C. **Data Collection.** The data collection is an explanation of the methods you used to gather your quantitative and/or qualitative data. This will help establish reliability and validity in your research design.
- D. **Data Analysis.** The data analysis is the interpretation of your data you collected. This will help provide a sense of meaning to your data and relate it to your thesis. In addition, you should provide a social theoretical interpretation of your results. Depending on your data and audience wants, includes graphs of your data.
- E. **Reflexivity.** Reflexivity is when you discuss your personal reasons for doing research project and what limitations you came across during the research project. This will help eliminate any type of bias the audience may assume about your personal investment in the research study and clear up any misunderstanding in your data. Furthermore, distinguish how your research study contributes to your field of study.

LONGITUDINAL STUDY:

In a longitudinal study, researchers repeatedly examine the same individuals to detect any changes that might occur over a period of time.

Longitudinal studies are a type of correlational research in which researchers observe and collect data on a number of variables without trying to influence those variables.

While they are most commonly used in medicine, economics, and epidemiology, longitudinal studies can also be found in the other social or medical sciences.

How to perform a longitudinal study

If you want to implement a longitudinal study, you have two choices: collecting your own data or using data already gathered by somebody else.

✚ Using data from other sources

Many governments or research centres carry out longitudinal studies and make the data freely available to the general public. For example, anyone can access data from the 1970 British Cohort Study, which has followed the lives of 17,000 Brits since their births in a single week in 1970, through the UK Data Service website.

These statistics are generally very trustworthy and allow you to investigate changes over a long period of time. However, they are more restrictive than data you collect yourself. To preserve the anonymity of the participants, the data collected is often aggregated so that it can only be analysed on a regional level. You will also be restricted to whichever variables the original researchers decided to investigate.

If you choose to go this route, you should carefully examine the source of the dataset as well as what data is available to you.

Collecting your own data

If you choose to collect your own data, the way you go about it will be determined by the type of longitudinal study you choose to perform. You can choose to conduct a retrospective or a prospective study.

In a retrospective study, you collect data on events that have already happened.

In a prospective study, you choose a group of subjects and follow them over time, collecting data in real time.

Retrospective studies are generally less expensive and take less time than prospective studies, but are more prone to measurement error.

Ethical Issues in Data Collection

- Do not put Participants at Risk
- Respect Vulnerable Populations
- Develop an Informed Consent Form
- Have participants sign before the study begins.
- Do not coerce participants to participate
 - Respect confidentiality of participant's identity & privacy
- Gain authorized access to research site
- Leave research site undisturbed
- In experimental studies, researchers must collect data so all participants benefit from treatment.
 - Not just the experimental group.
- In qualitative studies, researchers should consider how interview will improve /impact the participant

Ethical Issues in Data Analysis and Interpretation

- Study must protect the anonymity of individuals, rolls and incidents within the study.
- Data must be safely stored
- clearly define ownership of data –researchers, participants or faculty advisors
 - Provide an accurate account of the information collected

FIELD TECHNIQUES

PARTICIPATORY RURAL APPRAISAL (PRA)

Participatory rural appraisal (PRA) is an approach used by non-governmental organizations (NGOs) and other agencies involved in international development. The approach aims to incorporate the knowledge and opinions of rural people in the planning and management of development projects and programmes.

PROBLEM AND PURPOSES

Participatory rural appraisal is a citizen-centred method of development. The process empowers locals by including them directly in the issue identification and evaluation process and, in many cases, in the final implementation and post-construction monitoring. The concept of PRA has evolved overtime since, as Narayanasamy notes, “as a development tool, it cannot just stop with committing the people in appraising and analysis their problems...rather; it must go beyond that and extend into analysis, planning and action.” Subsequently, PRA has become known as Participatory Learning and Action.

Many development organizations face the ‘local knowledge problem’: the inability to understand or identify the full scope of local needs without communicating with residents. Participatory rural appraisal allows organizers to overcome this problem by including residents directly in the issue identification and evaluation process.

KEY PRINCIPLES FOR CONDUCTING PRA'S

✚ Preparation

It is imperative that thorough preparation is undertaken prior to the surveys to ensure that all available secondary data on the locality and subject has been reviewed, allowing suitable villages to be identified to capture a broad sample, before surveying commences. It is also sensible to enlist the help of external collaborators, preferably with detailed

Knowledge of the locality, and bearing no prejudice or hierarchical position.

✚ Facilitation

It is imperative that the external professional displays good facilitation skills, which aims to enable local people to undertake some or all of the investigation, mapping, modelling, diagramming, ranking, scoring, quantification, analysis, presentation and planning themselves. Analysis is then shared with outsiders, but the information stays with the people who generated it. In order to capture all that is to be observed and recorded during a PRA, it is recommended that a minimum of two external facilitators (sometimes three depending on the method used) are employed. This will allow information to be recorded in detail, whilst a facilitator observes the interaction between participants. It is also useful to generate some feedback from the villagers surveyed on design methods

Employed.

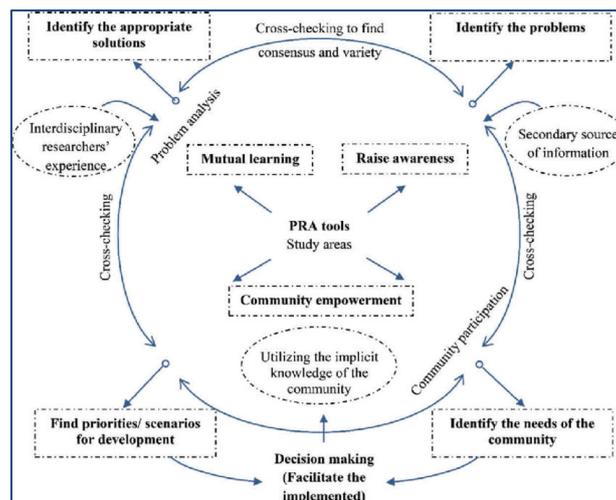
Behaviour and attitudes

The behaviour and attitudes of external facilitators are of primary importance, more important than methods even. All important attitudes include: critical self-awareness and embracing error, sitting down, listening and learning, not lecturing but allowing the villagers to be the main teachers and analysts. It means that outsiders must take time to reflect on how their role in community interactions change and what they must learn to do and to stop doing, if local people are to benefit from this.

Longevity

Participatory approaches are not substitutes for, but are rather an integral part of, long-term dialogue and sustained interaction. A single, brief participatory exercise with a group of local people will not lead to positive and lasting change. PRAs are not a panacea to qualitative surveying. PRAs work most effectively where they are carried out over a

sufficient length of time, with the facilitators living amongst the community under survey and absorbing themselves in community life. In this way, mutual respect will be gained, and less formal information can be extracted. In addition, the longer the survey, the greater and more representative the sample will be.



PRA Process

Every village is different in some way or the other. People follow different cultural Practices and social mores. Therefore, it is almost impossible to prescribe the right Way (process to be followed) for conducting PRA exercises, except some general Prescriptions such as people in every culture like to be respected; deep inside, Everyone is honest and treat people accordingly and so on. However, the following Can be taken as a general protocol for generating reliable data through a PRA process.

(i) Atmosphere-Based

- is the whole atmosphere of information generation informal, free, and conducive And non-threatening?
- Is the place chosen for conducting PRA exercise a common place where all

Could assemble? Is there any place-specific barrier to assembling and Discussing?

How does the seating position look? Who seem to occupy superior place? (It should be either that the “villages” take the superior position or the outsiders” and the “villagers” occupy positions of equality. The outsiders should never occupy the superior position.)

(ii) Team-Based

- Is there „role reversal“ (outsiders as learners, villagers as teachers)?
- Is there any „role confusion“ and „role change“ among the PRA team members?
- Is there „rushing“? or is the learning process gradual and progressive?
- Is there coherence between successive questions or are they jumbled?
- Does the facilitator/interviewer establish proper eye contact with every participant or does he/ she focus on only one or two informants who are seemingly active?
- Do “they” do it?
- Are adequate probing and crosschecking of information done?
- Are the six helpers in PRA, viz., what, when, where, how, who, and, which; adequately and continuously used?
- Is the information generated triangulated?
- Is the facilitator really sensitive, or dramatic or pretending to be dumb? Is the discussion too lengthy?
- Is shoulder-tapping done whenever necessary, as a way of indicating to our team members that there is a digression / deviation taking place?
- Is there a natural starting and natural withdrawal? * Are „chance encounters“ (during Transect) made use of or ignored?
- Does the team share the information with the villagers?
- Are the responses and answers properly judged? (Since the responses may be Fact/ opinion/rumour/ false)?
- Is there any language-related barrier? You may speak the same language, but still not understand each other because of the difference in slang?
- How is the Team Mix? (Is the team multi-disciplinary?)

iii) People – Based

- How is the Villagers Mix? (young? old? men? women? mixed?)
- What is the „outsiders“, „villagers“ ratio? Locals should be more, and outsiders can be a small team.
- Do the villagers, do, say, show and map with natural involvement and willingness or with reluctance and because they got caught into it?
- Are locally available materials used in the exercises?

A continuous reflection over the process would enable us to handle the PRA methods with ease, confidence and ingenuity. All these would enhance the quality of the PRA.

FOCUS GROUP DISCUSSION

A focus group discussion (FGD) is a good way to gather together people from similar backgrounds or experiences to discuss a specific topic of interest. The group of participants is guided by a moderator (or group facilitator) who introduces topics for discussion and helps the group to participate in a lively and natural discussion amongst them.

The strength of FGD relies on allowing the participants to agree or disagree with each other so that it provides an insight into how a group thinks about an issue, about the range of opinion and ideas, and the inconsistencies and variation that exists in a particular community in terms of beliefs and their experiences and practices.

FGDs can be used to explore the meanings of survey findings that cannot be explained statistically, the range of opinions/views on a topic of interest and to collect a wide variety of local terms. In bridging research and policy, FGD can be useful in providing an insight into different opinions among different parties involved in the change process, thus enabling the process to be managed more smoothly. It is also a good method to employ prior to designing questionnaires.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.
 - Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not dominate it, and so that those participants who tend not to be highly verbal are able to share their views.
 - Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Advantages of Focus Groups:

Some of the focus groups advantages are as follows:

1. The discussions are kept under control:

The discussions in the focus groups can be kept under control. This is because there is no designated leader in the group and the discussions are made natural.

The ideas and the opinions flow freely without any rules and the regulations to follow.

2. Moderator is the key:

The focus groups have a moderator in them and the moderator plays a role of controlling the situation.

Like the moderator is required to keep the discussion under control and during the interview, the focus areas of the interest are taken as topics for the discussions.

3. New ideas are generated:

As the discussion in the focus groups flows without any restriction, the space for new ideas to flow increases manifold. More ideas flow when more of the liberty is given while the discussions are going on.

With liberty, more ideas flow as the respondents are free from any control which is a big advantage for the company as well as the employee volunteer.

4. The focus groups are not static:

The focus groups are not static. They are flexible. One can work as per his or her comfort. Like there are no set rules to follow because the focus groups are not formally formed. They are formed naturally and this is why they are more flexible and less static.

Any changes needed in the opinion or the concept can easily be done as the stern behaviour is not required to keep discussions going in the focus groups.

5. Changes can be bought whenever required:

The moderator in the group can make changes whenever he or she wants. In order to facilitate the discussions in a better manner, the changes are needed, so that can easily be done with the help of the flexible group.

If any concept needs a major or the emergency changes, then it can easily be done with the help of the moderator and the flexibility of the focus group.

Disadvantages of Focus Groups:

If the focus groups provide advantages, it also provides some of the disadvantages. Some of the focus groups disadvantages are

1. The moderators control the discussion as per his or her experience:

As said the discussions are controlled by the moderator. The level of control depends on his or her experience in the field.

In case the moderator is not experienced, he or she might face problems as the other people in the group might dominate him. So, this is one of the disadvantage of the focus group.

2. Sensitive ideas may not be discussed:

Sometimes the respondents are not ready to discuss some of the sensitive issues or the ideas which may concern the public.

So, this way the discussions get a halt and at times the discussions are not open. The discussion gets restricted and reserved which is not good for the output of the end product or even for the image of the company in the market.

3. Heterogeneity of individuals:

With the Heterogeneity of the individuals and also the small sample size, the discussions get restricted.

Less people in a group, less ideas and opinions are generated. So, this way the group findings are not enough to form the final projections. Also, the discussions at times take a different route as they are not formal and naturally flow in a direction.

More the respondents, more the ideas and opinions come forward and only this helps in bringing the new ideas and compete in the market with the competitors.

4. Sometimes the findings are not at all natural:

Although the set-up is natural yet many times the respondents fail to express naturally. At times the focus group can be unnatural and due to this, the findings may be far from the natural response which directly affects the end product of the company.

The members may fail to express their natural opinions or the personal choices related to the topic in the hand or going during the discussions. The members in the group may be hesitant to speak up openly.

This usually happens when the thoughts of another person go against to what their views are. So, this also forms one of the disadvantages.

5. The depth of the issue is not covered:

The depth of the issue is not covered at times. so, this way the importance and the depth analysis is not done. This way the research on a particular product or the service goes in vain as it is not in-depth.

Not just this, if we compare the other surveys or the methods, the focus group method is more expensive to execute. This is because each participant has to compensate some amount. So this also forms one of the disadvantages of the focus group.

HOW TO CONDUCT A FOCUS GROUP DISCUSSION

□ Creating the Questionnaire

It is important to take time to carefully plan your questions. Poorly-worded, biased, or awkward questions can derail a FGD and spoil the quality of your data.

- Keep the number of questions reasonable (under 10, if possible). This prevents the participants from getting confused or worn out by a long discussion.
- Keep the questions simple and short. FGD participants won't get the chance to see the questions like in a survey.
- Ensure that the wording on questions is clear. Otherwise, participants will end up discussing the question itself, rather than what the question was trying to ask.

□ Question Types

There should be three types of questions in a focus group discussion:

- Probe questions: these introduce participants to the discussion topic and make them feel more comfortable sharing their opinion with the group
- Follow-up questions: delve further into the discussion topic and the participants' opinions
- Exit question: check to ensure that you didn't miss anything

Length of the Focus Group Discussion

An FGD should be between 60 and 90 minutes.

If the FGD is shorter than 60 minutes, it is often difficult to fully explore the discussion topic. If the FGD is longer than 90 minutes, the discussion can become unproductive (as participants get weary) and the discussion can start to impose on participants' time.

Selecting the Participants

Focus group discussions involve two to eight people on average. Greater than eight participants becomes crowd for a FGD and is more suited for an advisory board.

Creating homogeneity in the FGD group can help participants feel more comfortable expressing their opinions.

Consider the following when you are choosing your participants:

Gender: Will men and women feel comfortable discussing this topic in a mixed-gender group? For example, women might feel uncomfortable discussing maternal health if men are in the group.

Age: Will age affect the way that people react to this topic? For example, a young person might feel uncomfortable talking about his drinking habits if older people from his community are in the room.

Hierarchy: Will people of different hierarchical positions be able to discuss this topic equally? For example, a student might feel uncomfortable discussing her teachers if the school principal is in the FGD.

Certain criteria should be set up front and used to screen potential FGD participants.

Preparing for the Focus Group Discussion

Make sure the participants have provided informed consent verbally or ideally on a written form, in line with research ethics best practices.

- Be sure to make the location and time of the FGD are clear to all participants.
- If you anticipate some participants not showing up, invite 10-20% extra participants. However, be careful to not create too large of a group.
- Be sure that the FGD is in a public place that is convenient for participants. Consider the location's proximity to public transportation. If the FGD must happen out in the field, make it as comfortable and convenient for participants as possible.
- Make sure that the setting does not bias the information being collected.
- If it is important to collect demographic data from participants (like age, gender, caste, etc), design a short form that takes no more than 2 or 3 minutes to complete. The form can be administered before the focus group starts.

Moderator Techniques for Focus Group Discussions

As a moderator, it is important to ensure that all participants are comfortable and engaged with the discussion, and that their opinions are being heard. The following techniques are helpful:

- Remain neutral to ensure that everyone feels comfortable expressing their opinion. No nodding or shaking your head, raising eyebrows, agreeing or disagreeing with comments, or praising or denigrating participants.
- Elicit further information from shy participants with comments like “Can you tell me more about that?”, “Help me understand what you mean”, or “Can you give an example?”
- Deal with dominant participants by acknowledging their opinion and soliciting other opinions. Sentences like “Thank you. What do other people think?” can be helpful.
- Paraphrase or summarize long, unclear comments by participants. This shows participants that the moderator is actively listening, and it helps the moderator to ensure he or she has understood the participant's statement.

- Act spontaneously if needed. If the conversation goes in an unexpected, but productive direction, go with it and ask questions that were not on the initial questionnaire. Probe deeper into new topics and ideas, as long as the information being gained is valuable.

Limitations of Focus Group Discussions

It is important to realize that there are several limitations to FGDs. First, since FGD data is qualitative, it cannot necessarily be generalizable to the population. This is because qualitative data is often context specific.

Second, facilitators must ensure that their bias is not evident. Otherwise, it will veer the trajectory of the conversation. They must be also be active in ensuring that active participants do not overpower subdued participants during the discussion.

POST FIELD TECHNIQUES

METHODS OF REPORT WRITTING

Research reports are the product of slow, painstaking, accurate inductive work. The usual steps involved in writing report are:

- logical analysis of the subject-matter;
- preparation of the final outline;
- preparation of the rough draft;
- rewriting and polishing;
- preparation of the final bibliography; and
- Writing the final draft.

Though all these steps are self-explanatory, yet a brief mention of each one of these will be appropriate for better understanding.

Logical analysis of the subject matter: It is the first step which is primarily concerned with the development of a subject. There are two ways in which to develop a subject

- Logically
- Chronologically.

The logical development is made on the basis of mental connections and associations between the one thing and another by means of analysis. Logical treatment often consists in developing the material from the simple possible to the most complex structures. Chronological development is based on a connection or sequence in time

or occurrence. The directions for doing or making something usually follow the chronological order.

Preparation of the final outline: It is the next step in writing the research report “Outlines are the framework upon which long written works are constructed. They are an aid to the logical organization of the material and a reminder of the points to be stressed in the report.”

Preparation of the rough draft: This follows the logical analysis of the subject and the preparation of the final outline. Such a step is of utmost importance for the researcher now sits to write down what he has done in the context of his research study.

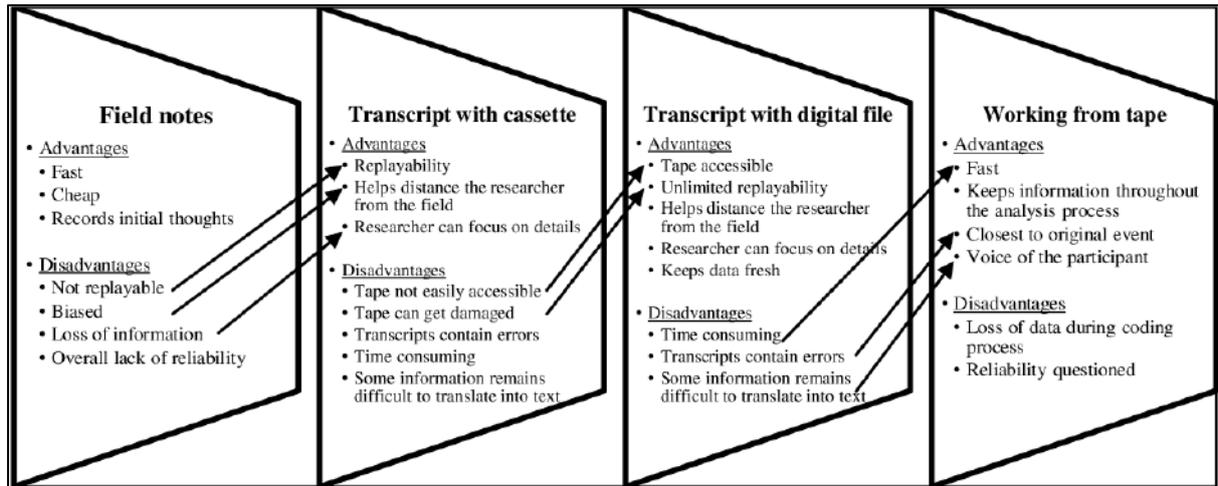
Rewriting and polishing of the rough draft: This step happens to be most difficult part of all formal writing. Usually this step requires more time than the writing of the rough draft. The careful revision makes the difference between a mediocre and a good piece of writing. While rewriting and polishing, one should check the report for weaknesses in logical development or presentation.

Preparation of the final bibliography: Next in order comes the task of the preparation of the final bibliography. The bibliography, which is generally appended to the research report, is a list of books in some way pertinent to the research which has been done. It should contain all those works which the researcher has consulted. The bibliography should be arranged alphabetically and may be divided into two parts; the first part may contain the names of books and pamphlets, and the second part may contain the names of magazine and newspaper articles. The entries in bibliography should be made adopting the following order:

For books and pamphlets the order may be as under:

- Name of author, last name first.
- Title, underlined to indicate italics.
- Place, publisher, and date of publication.
- Number of volumes.

Writing the final draft: This constitutes the last step. The final draft should be written in a concise and objective style and in simple language, avoiding vague expressions such as “it seems”, “there may be”, and the like ones. While writing the final draft, the researcher must avoid abstract terminology and technical jargon. Illustrations and examples based on common experiences must be incorporated in the final draft as they happen to be most effective in communicating the research findings to others.



FROM FIELD NOTES TO TRANSCRIPTS TO TAPE RECORDINGS

Participant observation:

Participant observation is one type of data collection method by practitioner-scholars typically used in qualitative research and ethnography. This type of methodology is employed in many disciplines, particularly anthropology (incl. cultural anthropology and European ethnology), sociology (incl. sociology of culture and cultural criminology), communication studies, human geography, and social psychology. Its aim is to gain a close and intimate familiarity with a given group of individuals (such as a religious, occupational, youth group, or a particular community) and their practices through an intensive involvement with people in their cultural environment, usually over an extended period of time.

Method and practice

Such research involves a range of well-defined, though variable methods: informal interviews, direct observation, participation in the life of the group, collective discussions, analyses of personal documents produced within the group, self-analysis, results from activities undertaken off or online, and life-histories. Although the method is generally characterized as qualitative research, it can (and often does) include quantitative dimensions. Traditional participant observation is usually undertaken over an extended period of time, ranging from several months to many years, and even generations. A strength of observation and interaction over extended periods of time is that researchers can discover discrepancies between what participants say—and often believe—should happen (the formal system) and what actually does happen, or between different aspects of the formal system; in contrast, a one-time survey of people's answers to a set of questions might be quite consistent,

but is less likely to show conflicts between different aspects of the social system or between conscious representations and behaviour.

Howell's phases of participant observation

In participant observation, a researcher's discipline based interests and commitments shape which events he or she considers are important and relevant to the research inquiry. According to Howell (1972), the four stages that most participant observation research studies are establishing rapport or getting to know the people, immersing oneself in the field, recording data and observations, and consolidating the information gathered.

The phases are as follows

- **Establishing Rapport:** Get to know the members, visit the scene before study. Howell states that it is important to become friends, or at least be accepted in the community, in order to obtain quality data.
- **In the Field (do as the locals do):** It is important for the researcher to connect or show a connection with the population in order to be accepted as a member of the community. This sets the stage for how well the researcher blends in with the field and the quality of observable events him or her experiences.
- **Recording Observations and Data:** Along with field notes and interviews, researchers are encouraged to record their personal thoughts and feelings about the subject of study through reflexivity journals. The researchers are prompted to think about how their experiences, ethnicity, race, gender, sex, sexual orientation, and other factors might influence their research, in this case what the researcher decides to record and observe. Researchers must be aware of these biases and enter the study with no misconceptions about not bringing in any subjectivities into the data collection process.
- **Analysing Data:**
 1. Thematic Analysis: organizing data according to recurrent themes found in interviews or other types of qualitative data collection and
 2. Narrative Analysis: categorizing information gathered through interviews, finding common themes, and constructing a coherent story from data.

Types of participant observation

Type	Level of Involvement	Limitations
Non-Participatory	No contact with population or field of study	Unable to build rapport or ask questions as new information comes up.
Passive Participation	Researcher is only in the bystander role	Limits ability to establish rapport and immersing oneself in the field.
Moderate Participation	Researcher maintains a balance between "insider" and "outsider" roles	This allows a good combination of involvement and necessary detachment to remain objective.
Active Participation	Researcher becomes a member of the group by fully embracing skills and customs for the sake of complete comprehension	This method permits the researcher to become more involved in the population. There is a risk of "going native" as the researcher strives for an in-depth understanding of the population studied.
Complete Participation	Researcher is completely integrated in population of study beforehand (i.e. they are already a member of particular population studied).	There is the risk of losing all levels of objectivity, thus risking what is analysed and presented to the public.

Strengths and Weaknesses

The strengths of participant observation include the depth of knowledge that it allows the researcher to obtain and the perspective of knowledge of social problems and phenomena generated from the level of the everyday lives of those experiencing them. Many consider this an egalitarian research method because it centres the experiences, perspectives, and knowledge of those studied. This type of research has been the source of some of the most striking and valuable studies in sociology.

Some drawbacks or weaknesses of this method are that it is very time-consuming, with researchers spending months or years living in the place of study. Because of this, participant observation can yield a vast amount of data that might be overwhelming to comb through and analyse. And, researchers must be careful to remain somewhat detached as observers, especially as time passes and they become an accepted part of the group, adopting its habits, ways of life, and perspectives.

TECHNIQUES AND FORMULATION OF RURAL PLANNING THROUGH DATA ANALYSIS

APPLICATION OF QUALITATIVE RESEARCH

DEFINITION OF STAKEHOLDER ANALYSIS

Stakeholder analysis is a process of systematically gathering and analysing qualitative information to determine whose interests should be taken into account when developing and/or Implementing a policy or program.

Who Is a Stakeholder?

Stakeholders in a process are actors (persons or organizations) with a vested interest in the policy being promoted. These stakeholders, or “interested parties,” can usually be grouped into the following categories: international/donors, national political (legislators, governors), public (ministry of health [MOH], social security agency, ministry of finance), labor (unions, medical associations), and commercial/private for-profit, non-profit (nongovernmental organizations [NGOs], foundations), civil society, and users/consumers.

Analysis of Stakeholder Characteristics

The analysis includes such stakeholder characteristics as knowledge of the policy, interests related to the policy, position for or against the policy, potential alliances with other stakeholders, and ability to affect the policy process (through power and/or leadership).

Why Is this Analysis Useful

Policymakers and managers can use a stakeholder analysis to identify the key actors and to assess their knowledge, interests, positions, alliances, and importance related to the policy. This allows policymakers and managers to interact more effectively with key stakeholders and to increase support for a given policy or program. When this analysis is conducted before a policy or program is implemented, policymakers and managers can detect and act to prevent potential misunderstandings about and/or opposition to the policy or program. When a stakeholder analysis and other key tools are used to guide the implementation, the policy or program is more likely to succeed.

PURPOSE OF STAKEHOLDER ANALYSIS

A) To determine the key organizational players

The stakeholders involved in any project can be categorized as players, context settlers, crowd, and subjects. A detailed analysis before the project begins will enable you to identify the potential holders and initiate discussions with them. Moreover, by establishing a bond it is possible to get their assistance and support throughout. Not only does this strengthen the entry-level professionals but also boosts the feasibility of the project.

B) To gain early momentum

Not everyone listed as a stakeholder needs to be included right from the beginning. This is where a stakeholder analysis can prove beneficial. Once having identified the most important stakeholders, early discussions and gatherings can be scheduled. This provides an impetus for a successful commencement and completion of the project.

C) To help address conflicts or issues early on

The analysis can help you clear the issues among the various groups. If there is no stakeholder analysis, a person can feel left out and might work in a manner that negatively impacts the project. With identification and categorization, it is possible to ask feedbacks from everyone and turn threats into potential resources.

STEPS FOR STATEHOLDER ANALYSIS

Performing a stakeholder analysis involves these three steps.

Step 1: Identify your stakeholders

From a list of people who might seem as valuable stakeholders, identifying them is a must. The identification can be done through a brainstorming session with the whole team. Enlist all those people who are pivotal for the project and ensure you do not miss out on anyone. This list can be reduced later, but since this is the first stage, no further filtration needs to be done.

Step 2 :Prioritize the stakeholders:

As mentioned before, grouping stakeholders can make your job to give instructions a lot easier. Classify them based on their participation, interest, and influence. An easy approach to this vital step of classification is to use the stakeholder analysis matrix.

A stakeholder analysis matrix is an effective project tool that enables you to identify the most important stakeholders. The power interest matrix is a commonly used one. Based on the power interest matrix, you can prioritize and decide the future course of action.

This matrix is classified into four classes: –

- High power, high interest.
- High power, low interest.

- Low power, high interest.
- Low power, low interest.

Step 3: Ensure effective communication and maximum coordination:

Once the groups are formed, one must look into how this can be taken forward without any rough patches. It is important to involve all the groups whenever necessary. Maintaining a healthy professional relationship is quintessential because only then will they extend full support for the successful implementation of the project. Questions such as what motivates the stakeholder, what other priorities they have, will they have a positive view of the project are few of the suggestions to kick-start a constructive stakeholder relationship.

CONCLUSION

No project in an organization is a single-step process. It goes through several ups and downs and amendments are made at every single stage. To ensure the complete success of the undertaken project, it is best to have the approval of the company's stakeholders. If otherwise, there is a possibility that the entire project may be stopped or its progress may be hampered all of which are obstacles.

SWOT ANALYSIS

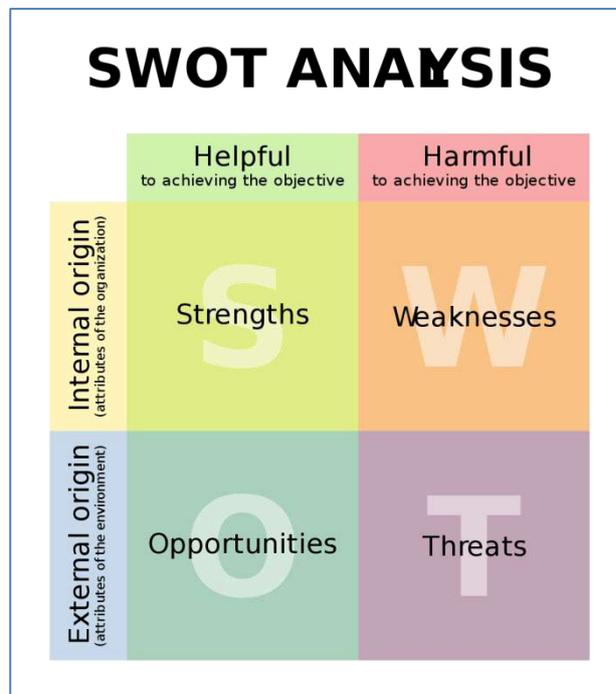
SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription.

How to Do a SWOT Analysis

SWOT analysis is a technique for assessing the performance, competition, risk, and potential of a business, as well as part of a business such as a product line or division, an industry, or other entity.

Using internal and external data, the technique can guide businesses toward strategies more likely to be successful, and away from those in which they have been, or are likely to be, less successful. Independent SWOT analysts, investors, or competitors can also guide them on whether a company, product line, or industry might be strong or weak and why.



A Visual Overview

Analysts present a SWOT analysis as a square segmented into four quadrants, each dedicated to an element of SWOT. This visual arrangement provides a quick overview of the company's position. Although all the points under a particular heading may not be of equal importance, they all should represent key insights into the balance of opportunities and threats, advantages and disadvantages, and so forth.

Strengths

Strengths describe what an organization excels at and what separates it from the competition: a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favourable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and market share.

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield.

Other common threats include things like rising costs for materials, increasing competition, tight labour supply and so on.

How to Use a SWOT Analysis

What occurs within the company serves as a great source of information for the strengths and weaknesses categories of the SWOT analysis. Examples of internal factors include financial and human resources, tangible and intangible (brand name) assets, and operational efficiencies.

Potential questions to list internal factors are:

- (Strength) What are we doing well?
- (Strength) What is our strongest asset?
- (Weakness) What are our detractors?
- (Weakness) What are our lowest-performing product lines?
- External

What happens outside of the company is equally as important to the success of a company as internal factors. External influences, such as monetary policies, market changes, and access to suppliers, are categories to pull from to create a list of opportunities and weaknesses.

Potential questions to list external factors are:

- (Opportunity) What trends are evident in the marketplace?
- (Opportunity) What demographics are we not targeting?
- (Threat) How many competitors exist, and what is their market share?
- (Threat) Are there new regulations that potentially could harm our operations or products?

APPLICATION OF STATITICAL TECHNIQUES IN DEMOGRAPHIC DATA

POPULATION COMPOSITION

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation. Population composition depends on

Age

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally,

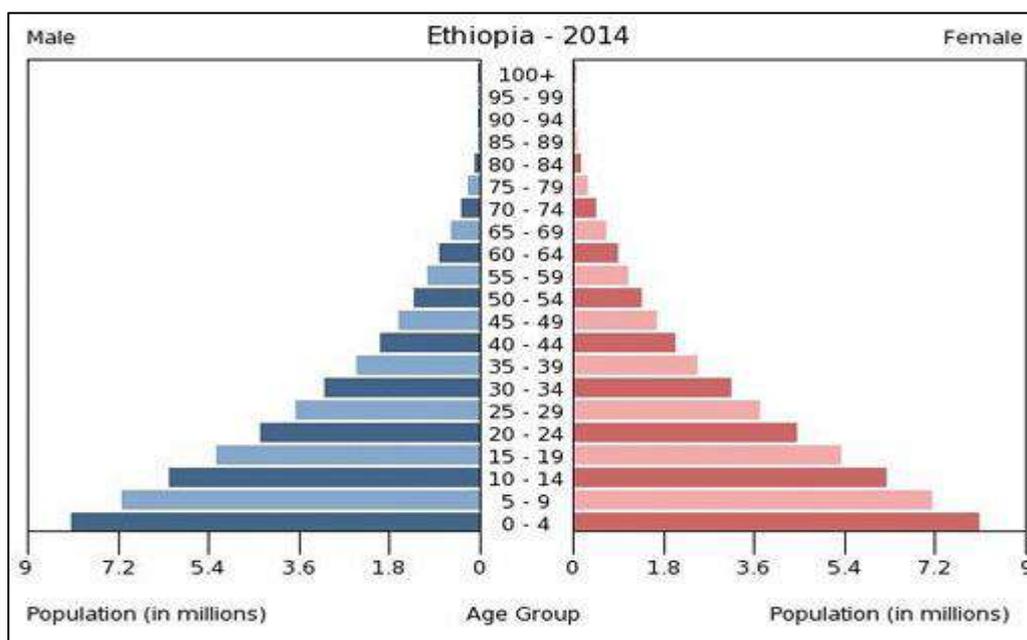
less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

Sex ratio

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males.

Population pyramid

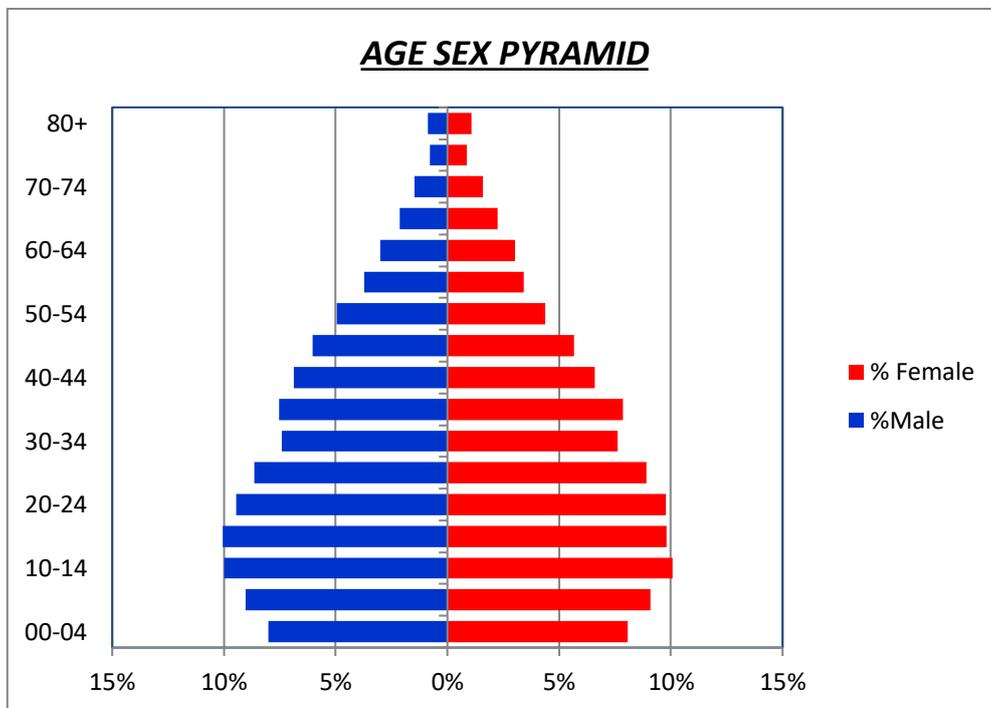
Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.



Above Figure shows the population pyramid for Ethiopia and, for comparison. The shape of the Ethiopian pyramid shows that there is a high birth rate and many more young people than old

TABLE FOR AGE SEX PYRAMID
SHOEING
POPULATION COMPOSITION

Age Group	Male	Female	Total	% Male	% Female
00-04	3743862	3589281	7333143	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%
65-69	991280	991713	1982993	-2%	2%
70-74	686881	703726	1390607	-1%	2%
75-79	360216	379551	739767	-1%	1%
80+	406536	477025	445803	-1%	1%
Total	46745275	44418389		100%	100%



Dependency Ratio

The dependency ratio is a measure of the number of dependents aged zero to 14 and over the age of 65, compared with the total population aged 15 to 64. This demographic indicator gives insight into the number of people of non-working age, compared with the number of those of working age. It is also used to understand the relative economic burden of the workforce and has ramifications for taxation. The dependency ratio is also referred to as the total or youth dependency ratio.

The Formula for the Dependency Ratio Is

Total (Age) Dependency Ratio =	$\frac{(\text{Population 0-14} + \text{Population 64>})}{\text{Working age population 15-64}}$	X 100
Child Dependency Ratio =	$\frac{\text{Population 0-14}}{\text{Working age population 15-64}}$	X 100
Old-Age Dependency Ratio =	$\frac{\text{Population 64>}}{\text{Working age population 15-64}}$	X 100

An Analysis of Dependency Ratios

Dependency ratios are generally reviewed to compare the percentage of the total population, classified as working age, that will support the rest of the nonworking age population. This provides an overview for economists to track shifts in the population. As the percentage of non-working citizens rises, those who are working are likely subject to increased taxes to compensate for the larger dependent population.

At times, the dependency ratio is adjusted to reflect more accurate dependency. This is due to the fact those over 64 often require more government assistance than dependents under the age of 15. As the overall age of the population rises, the ratio can be shifted to reflect the increased needs associated with an aging population.

Example of the Dependency Ratio

For example, assume that the mythical country of Investopedial and has a population of 1,000 people, and there are 250 children under the age of 15, 500 people between the ages of 15 and 64, and 250 people age 65 and older. The youth dependency ratio is 50%, or 250/500.

Limitations of the Dependency Ratio

The dependency ratio only considers age when determining whether a person is economically active. Other factors may determine if a person is economically active aside from age including status as a student, illness or disability, stay-at-home parents, early retirement, and long-term unemployed. Additionally, some people choose to continue working beyond age 64.

TABLE FOR DEPENDENCY RATIO

Age Group	Male	Female	Total
00-04	37,43,862	35,89,281	7333143
05-09	42,16,763	40,31,046	8247809
10-14	46,77,506	44,79,017	9156523
15-19	47,02,325	43,55,706	9058031
20-24	44,22,630	43,35,692	8758322
25-29	40,44,904	39,53,005	7997909
30-34	34,64,659	33,76,931	6841590
35-39	35,23,361	34,89,285	7012646
40-44	32,19,604	29,33,456	6153060
45-49	28,14,212	25,21,507	5335719
50-54	23,17,232	19,40,648	4257880
55-59	17,46,903	15,21,747	3268650
60-64	14,06,401	13,39,053	2745454
65-69	9,91,280	9,91,713	1982993
70-74	6,86,881	7,03,726	1390607
75-79	3,60,216	3,79,551	739767
80+	4,06,536	4,77,025	445803
Total	467,45,275	444,18,389	90725906

SUMMARY OUTPUT

Total Dependency Ratio	47.6916774
Child Dependency Ratio	40.2698561
Aged Dependency Ratio	7.42182134

Occupational Structure

The occupational structure of a nation refers to the percentage of its workforce employed in various economic ventures. To put it in other words, articulating the number of the total working population employed in agriculture and associated activities and the number of them involved in the manufacturing and service sectors can be identified from the occupational structure of the nation.

Types of Occupations

An occupation of a person is defined as the principal work or business which he or she carries out on a daily basis to earn their primary earning. An occupation or a job provides for a person's subsistence meaning it helps him to earn whatever is necessary to cover all the basic amenities of his life.

Occupation in any country can be broadly divided into three major categories. These are the building blocks of occupational structure meaning these different professions can also roughly indicate how expansive the occupational structure of a country is.

Primary occupations of any country include agriculture, construction and animal husbandry.

The **secondary** sets of occupations include the people who work in manufacturing and servicing industries.

Tertiary branch of occupations encompasses the part of the population working in communications, transport, administration and other remaining services.

Labour Force Participation Rate

The labour force participation rate is a measure of an economy's active workforce. The formula for the number is the sum of all workers who are employed or actively seeking employment divided by the total no institutionalized, civilian working-age population.

Labour force participation rate is defined as the section of working population in the age group of 16-64 in the economy currently employed or seeking employment. People who are still undergoing studies, housewives and persons above the age of 64 are not reckoned in the labour force.

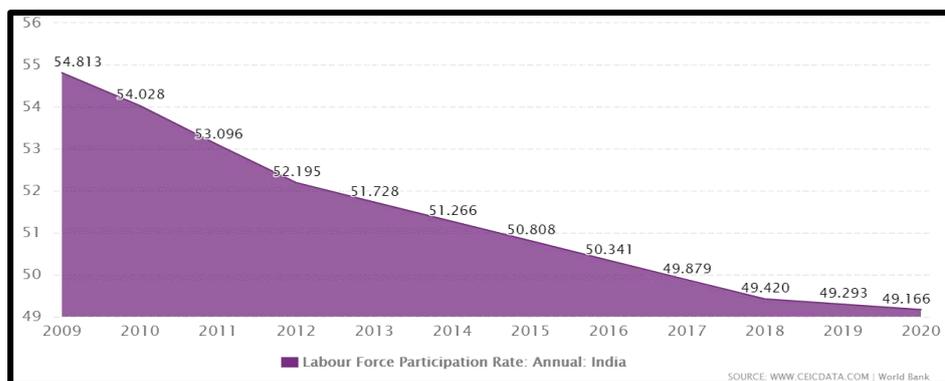
Labour Force Participation Rate in India

The Labour Force Participation Rate in India stood at 49.80% in the fiscal year 2017-18, as per the National Sample Survey Office (NSSO) Periodic Labour Force Survey (PLFS) report. Labour Force Participation Rate in India from 2005 until 2018 averaged 53.90%, reaching an all-time high of 63.70% in 2005 and a record low of 49.80% in 2018.

India Labour Force Participation Rate dropped to 46.3 % in Dec 2020, compared with 49.3 % in the previous year. India Labour Force Participation Rate is updated yearly, available from

Dec 1990 to Dec 2020, with an average rate of 57.5 %. The data reached the an all-time high of 58.4 % in Dec 1990 and a record low of 46.3 % in Dec 2020. India Labour Force Participation Rate is reported by reported by CEIC Data.

In the latest reports, India Population reached 1,355.0 million people in Mar 2021. Unemployment Rate of India increased to 7.1 % in Dec 2020.



Method of computation

The labour force participation rate is calculated as follows:

$$\text{LFPR (\%)} = \frac{\text{Labour force}}{\text{Working-age population}} \times 100$$

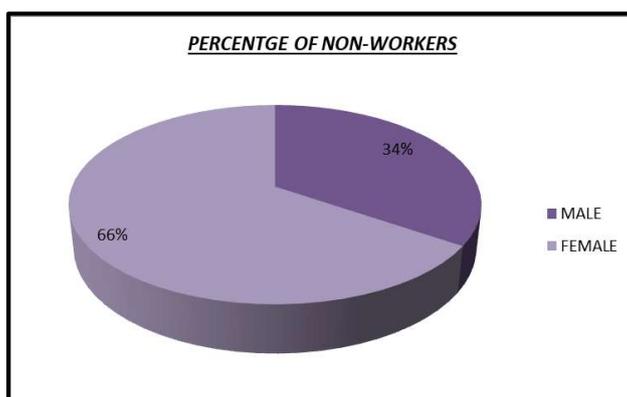
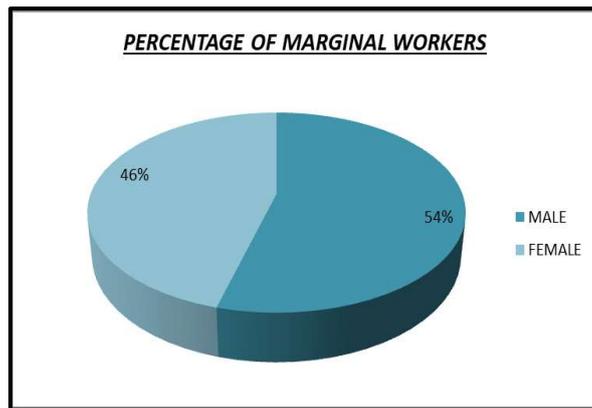
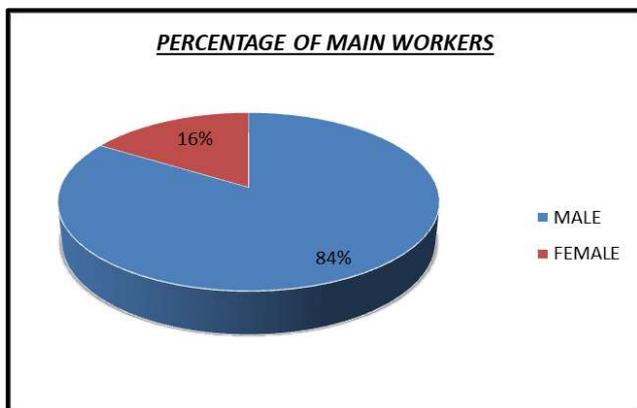
$$\text{LFPR (\%)} = \frac{[(\text{Persons employed} + \text{persons unemployed}) / \text{Working-age population}] \times 100}{100}$$

FEMALE LABOUR FOURCE PARTICIPATION IN INDIA

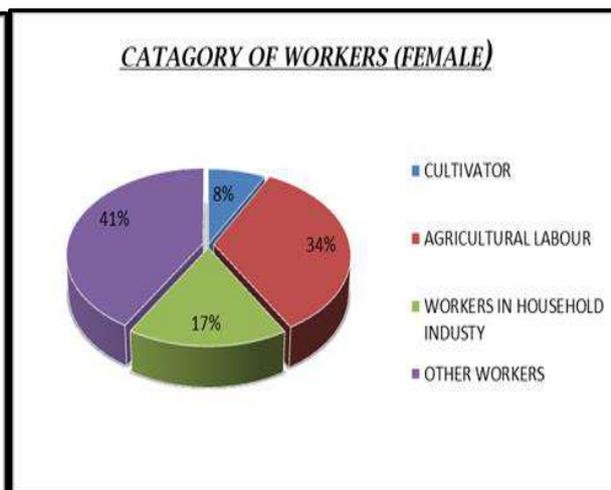
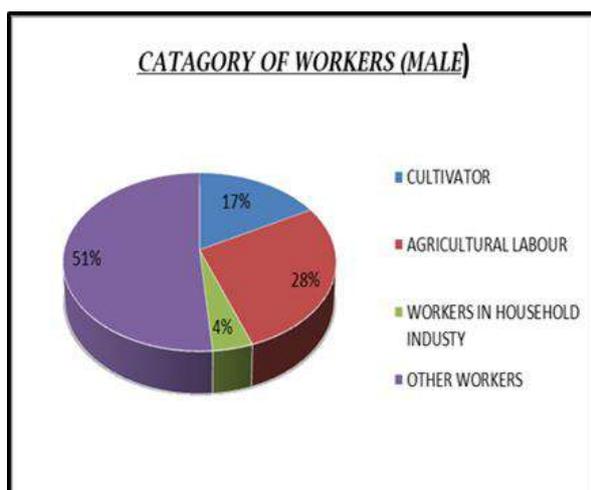
Female labour force participation is an important driver (and outcome) of growth and development. Women participate in the labour force in developing countries because of poverty and as a coping mechanism in response to shocks. The participation of women is the outcome of various economic and social factors. Low labour force participation of women in India:

- ❖ According to the International Labour Organisation’s (ILO) Report, 2019, 1.3 billion women were in work in 2018 as compared to 2 billion men– a less than 2% improvement in last 27 years. The report highlighted that women are paid 20% lower than men, as a global average.
- ❖ The female labour force participation rate (FLFPR) fell from 31.2% in 2012 to 23.3% in 2018. Further, the FLFPR for rural areas has declined by more than 11% in 2018.
- ❖ In rural areas, not only are women withdrawing from the labour force, they are also being outcompeted by men in the existing jobs. This situation necessitates a deeper understanding of issues that hinder female labour force participation.

OCCUPATIONAL STRUCTURE OF MAIN, MARGINAL AND NON-WORKERS OF KOLKATA



CATEGORY OF WORKERS (MAIN & MARGINAL) OF KOLKATA



SOURCE : DISTRICT CENSUS HANDBOOK OF KOLKATA , 2011

MIGRATION

Migration consists of all the relatively permanent changes of residence into, out of, or within a given political division or administrative area. Typically, internal migration involves the crossing of one or more administrative divisions—such as states, counties, or provinces, but it always occurs within the boundaries of a given country. Conversely, the crossing of an international boundary with the intention of changing residence is what defines international migration. Information on place of birth, duration of residence, place of previous residence, or place of residence at a specified date in the past can be used in conjunction with place of usual residence to determine the migration status of a respondent.

Description of the methods

Estimating migration from census data is not technically complicated. Provided that the census gather the appropriate information and are reasonably accurate it is possible to produce estimates of net immigration (i.e. immigration less emigration) of the foreign-born population (people born outside a particular country) and internal migration between (to and from) sub-national regions of a country, over the period between two censuses.

To estimate net immigration of foreigners one essentially subtracts from the number of foreign-born people enumerated in a census, the number of foreigners expected to have survived since being enumerated in the previous census.

In a similar way, if the censuses record the sub-national region of birth one can estimate net in-migration (i.e. net in-migration of those born outside the region less net out-migration of those born in the region) between sub-national regions of a country. However, if the census asks of people where they were living at some prior point in time, say at the time of the previous census, one is able to estimate directly the number of surviving migrants (i.e. migrants still alive at the time of the latest census) into and out of each sub-national region of the country since that prior point in time.

In order to estimate the number of migrants from the number of surviving migrants at the time of the second census one needs to add to these figures an estimate of the number of migrants who are expected to have died between moving and the time of the latest census.

If the latest census records other information such as year in which the migrant moved to the place at which the person was counted in the census, it is possible also to establish a trend of migration over time.

Migration is different from fertility and mortality both in that migrating is not final in the sense of a birth or death, but also that we are concerned not only with the population of origin, from which the migrant moved (which corresponds to a population exposed to the risk from which rates of migration akin to those of fertility and mortality can be calculated) but we also have a population to which the migrant moves, the destination population. Apart from this, in order to understand migration one is often interested in distinguishing between different types of migration (whether temporary or more permanent, whether circulatory or unidirectional, etc.). For these reasons there is a much wider range of measures and terminology associated with migration than there is with either fertility or mortality.

MIGRATION

- Migrants by place of birth are those who are enumerated at a village/town at the time of census other than their place of birth.
- A person is considered as migrant by place of last residence, if the place in which he is enumerated during the census is other than his place of immediate last residence. By capturing the latest of the migrations in cases where persons have migrated more than once, this concept would give a better picture of current migration scenario.
- 2001 Census, like previous censuses, had collected migration details for each individual by place of birth and last residence. Data on last residence along with details like duration of stay in the current residence and reason for migration provides useful insights for studying migration dynamics of population.

The net migration rate is the difference between the number of immigrants (people coming into an area) and the number of emigrants (people leaving an area) throughout the year. When the number of immigrants is larger than the number of emigrants, a positive net migration rate occurs. A positive net migration rate indicates that there are more people entering than leaving an area. When more emigrate from a country, the result is a negative net migration rate, meaning that more people are leaving than entering the area. When there is an equal number of immigrants and emigrants, the net migration rate is balanced.

The net migration rate is calculated over a one-year period using the mid-year population and a ratio.

Formula and example

$$N = (I - E) / M \times 1,000[5]$$

N = Net Migration Rate

I = Number of Immigrants Entering the Area

E = Number of Emigrants Leaving the Area

M = Mid-Year Population

At the start of the year, country A had a population of 1,000,000. Throughout the year there was a total of 200,000 people that immigrated to (entered) country A, and 100,000 people that emigrated from (left) country A. Throughout the year there was a total of 100,000 births and 100,000 deaths. What is the net migration rate?

First, find the mid-year population for country A.

$$M = [\text{Population at Start of Year} + \text{Population at End of Year}] / 2$$

$$M = [1,000,000 + (1,000,000 + 200,000 - 100,000)] / 2$$

$$M = [1,000,000 + 1,100,000] / 2$$

$$M = 2,100,000 / 2$$

$$M = 1,050,000$$

The mid-year population for country A is 1,050,000.

Second, find the net migration for country A, and please keep in mind this is simply the number of immigrants minus the number of emigrants, not the actual rate.

$$I - E = 200,000 - 100,000$$

$$I - E = 100,000$$

The net migration for country A is 100,000.

Third, plug your findings into the formula to find the net migration rate for country A.

$$N = (I - E) / M \times 1,000$$

$$N = 100,000 / 1,050,000 \times 1,000$$

$$N = 95.23809523809524$$

$$N = 95.2$$

APPLICATION OF GIS AND RS

PREPARATION OF LANDUSE MAP USING OPEN SOFTWARE

Land use mapping

City planners need to know which areas of a city are used for which purpose. Therefore, they produce a map of "land use", that identifies parts of a city and the major activities (land use) that happen there. Remote sensing imagery is very useful for this purpose, since you certainly don't want to spend many weeks or months walking or driving around a city to map its land use. But to use remote sensing imagery effectively, you have to be able to interpret it accurately.

The satellite image in this activity shows a part of downtown Montreal. It will be a bit harder to interpret this black and white image, because you don't have colour clues to rely on. But you can see quite a bit of spatial detail - even individual streets and large buildings.

Task There are five categories to map: water, industrial, central business district, parks & recreation, and residential & commercial. Choose a different colour for each of these categories and colour in the boxes in the index of the blank map. Then for each area outlined on the map, interpret the corresponding area on the image. Use the interpretation key below for clues. Once you figure out the land use for a particular area, colour in the map to match it.

Land use category	What does it mean?	Look for this in the image
water	rivers, lakes	smooth, dark areas with docks and bridges
industrial	large factories, railway yards, docks, storage yards	rail yards; large (wide) buildings; empty lots; bare ground; lack of rectangular street pattern
central business district	tall office buildings, hotels	closely packed, tall buildings casting large shadows
parks and recreation	parks, golf courses, race tracks, amusement parks, sports arenas	large grassed areas; winding paths; ponds; oval tracks; large, irregular buildings
residential and commercial	houses, apartment buildings, stores, shopping centres	rectangular street pattern, closely spaced houses and some larger buildings

STEPS FOR A LAND USE AND LAND COVER MAP IN QGIS

1. **Step 1** – Data downloading. ...
 1. 1.1 Downloading vector data. ...
 2. 1.2 Downloading ESA Global land cover datasets. ...
2. **Step 2** – Data pre-processing. ...
 1. 2.1 Loading vector data into QGIS. ...
 2. 2.2 Extracting shape file for chosen area
 3. 2.3 Adding ESA land cover data to QGIS. ...
 4. 2.4 Clipping ESA Global land cover datasets.

3 **Step 3** – Data processing and visualization

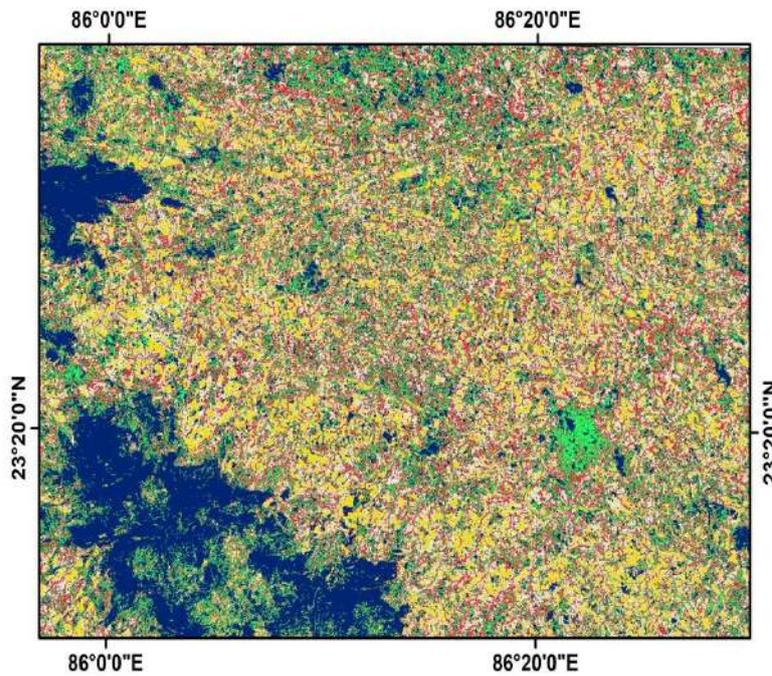
- 3.1 Converting ESA to SEEA land cover classifications
- 3.2 Mapping land cover change

4 **Step 4** - For the map to appear on the white screen, click on the white screen and draw a rectangle with the cursor. This image below reflects the selection as was made in this exercise

5 **Step 5** - On the toolbar at the left of the interface, click “Adds a new Scale Bar to the layout”. For the scale to appear on the map, click on the map and draw a rectangle with the cursor.

6 **Step 6** - On the taskbar at the top of the interface, click “Layout” button and Select on the “Export as Image”

Preparation of a simple landuse map



Legend

Landuse categories

-  Reservoir
-  Vegetation
-  Settlement
-  Marshy land
-  Agricultural land

0 3 6 12 18 24 Km.

Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

SPATIAL PLANNING

Spatial planning mediates between the respective claims on space of the state, market, and community. In so doing, three different mechanisms of involving stakeholders, integrating sectorial policies and promoting development projects mark the three schools of transformative strategy formulation, innovation action and performance in spatial planning

Spatial planning systems refer to the methods and approaches used by the public and private sector to influence the distribution of people and activities in spaces of various scales. Spatial planning can be defined as the coordination of practices and policies affecting spatial organization. Spatial planning is synonymous with the practices of urban planning in the United States but at larger scales and the term is often used in reference to planning efforts in European countries. Discrete professional disciplines which involve spatial planning include land use, urban, regional, transport and environmental planning. Other related areas are also important, including economic and community planning, as well as maritime spatial planning. Spatial planning takes place on local, regional, national and inter-national levels and often results in the creation of a spatial plan.

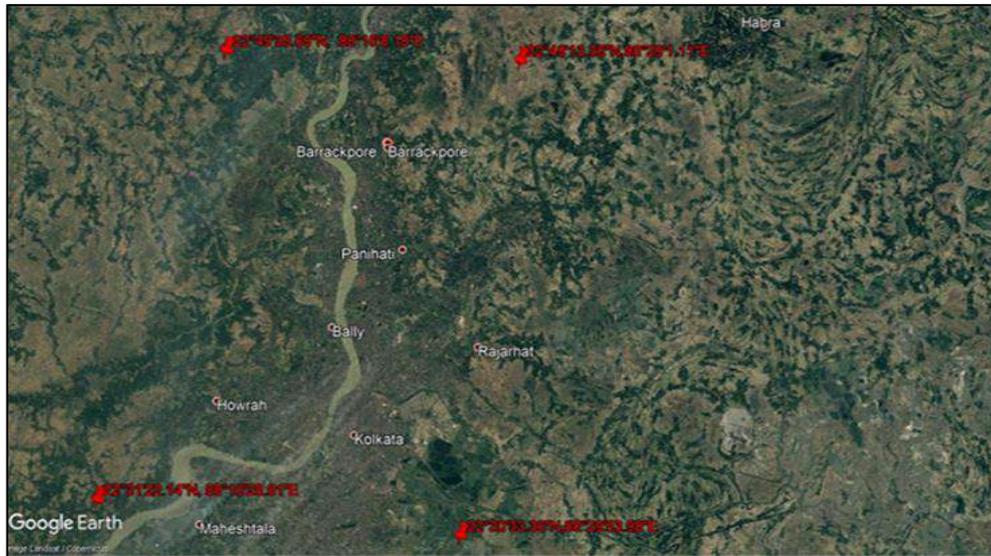
SPATIAL MAPPING

Spatial mapping (also called 3D reconstruction) is the ability to create a 3D map of the environment. It allows a device to understand and interact with the real world. Spatial mapping is useful for collision avoidance, motion planning, and realistic blending of the real and virtual world.

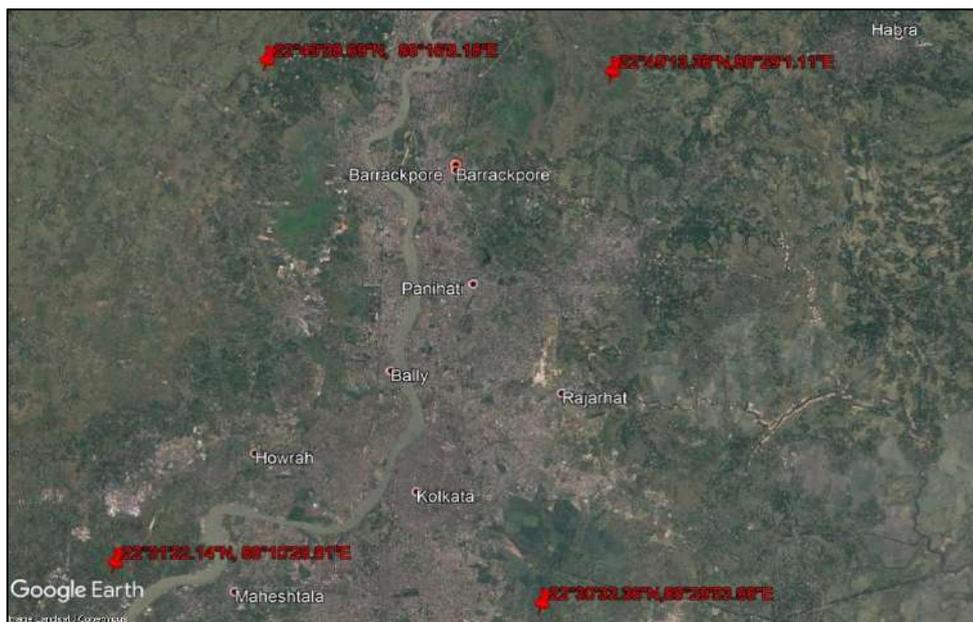
SPATIAL ANALYSIS

A distinction is made in this course between GIS and spatial analysis. In the context of mainstream GIS software, the term analysis refers to data manipulation and data querying. In the context of spatial analysis, the analysis focuses on the statistical analysis of patterns and underlying processes or more generally, spatial analysis addresses the question “what could have been the genesis of the observed spatial pattern?” It’s an exploratory process whereby we attempt to quantify the observed pattern then explore the processes that may have generated the pattern.

HABITAT CHANGE IDENTIFICATION IN THE BANKS OF RIVER HOOGLY (1984 -2020)



SETTLEMENT PATTERN 1984



SETTLEMENT PATTERN 2020

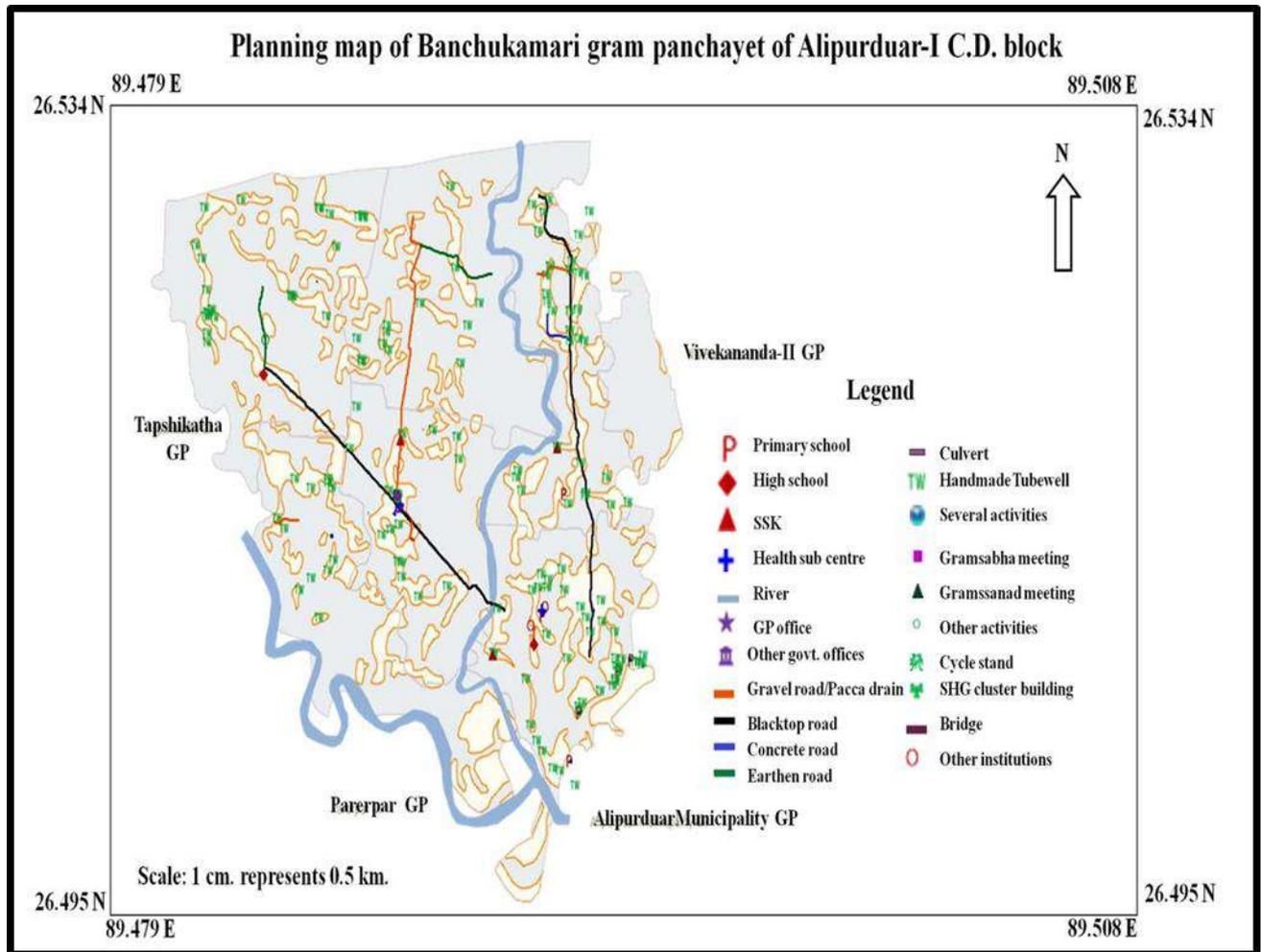
Formula for Change Detection = [(Area of 2020 – Area of 1984)/ Area of 1984]*100
= [(0.10-0.08)/0.08]* 100
= 25 units

INTERPRETATION

For find out the change of an area we select the both side of Hugli River area for the year of 1984 and 2020. In the image of 1984 the settlement pattern was isolated. Most of the area covered by greenery. But in the image of 2020 the settlement is mostly congested. The greenery is very low.

After using the formula it is clear that the area has been faced a huge change throughout these years between 1984- 2020. The amount of change is 25 units.

SPATIAL PLAN FORMULATION AND LAYOUT FOR A GRAM PANCHAYAT/ GRAM SABHA
VILLAGE LEVEL PLANNING BASED ON THE ABOVE TECHNIQUES AND ON AVAILABLE
INFORMATION FROM PRI



THANK YOU

NAME: DEBALINA MANDAL

BHAIRAB GANGULY COLLEGE

M.Sc. GEOGRAPHY 4th SEMESTER

ROLL: BGC/MGF/SIV/21 NO.- 323

REGISTRATION NO.- 1071921401420

What is Research: Definition, Methods, Types & Examples

What is Research?

Definition: Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.”

Inductive research methods analyse an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

Characteristics of research

1. Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
2. The analysis is based on logical reasoning and involves both inductive and deductive methods.
3. Real-time data and knowledge is derived from actual observations in natural settings.
4. There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
5. It creates a path for generating new questions. Existing data helps create more research opportunities.
6. It is analytical and uses all the available data so that there is no ambiguity in inference.

What is the purpose of research?

There are three main purposes:

1. **Exploratory:** As the name suggests, researchers conduct exploratory studies to explore a group of questions. The answers and analytics may not offer a conclusion to the perceived problem. It is undertaken to handle new problem areas that haven't been explored before. This exploratory process lays the foundation for more conclusive data collection and analysis.
2. **Descriptive:** It focuses on expanding knowledge on current issues through a process of data collection. Descriptive studies describe the behavior of a sample population. Only one variable is required to conduct the study. The three primary purposes of descriptive studies are describing, explaining, and validating the findings.
3. **Explanatory:** Causal or explanatory research is conducted to understand the impact of specific changes in existing standard procedures. Running experiments is the most popular form.

Types of research methods and example

Research methods are broadly classified as Qualitative and Quantitative.

Both methods have distinctive properties and data collection methods.

Qualitative methods -Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Types of qualitative methods include:

1. One-to-one Interview
2. Focus Groups
3. Ethnographic studies
4. Text Analysis
5. Case Study

Quantitative methods -Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

Types of quantitative methods include:

1. Survey research
2. Descriptive research
3. Correlational research

8 tips for conducting accurate research

1. Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.
2. Keep track of the frequency with which each of the main findings appears.
3. Make a list of your findings from the most common to the least common.
4. Evaluate a list of the strengths, weaknesses, opportunities, and threats that have been identified in a SWOT analysis.
5. Prepare conclusions and recommendations about your study.
6. Act on your strategies
7. Look for gaps in the information, and consider doing additional inquiry if necessary
8. Plan to review the results and consider efficient methods to analyse and dissect results for interpretation.

Literature search on research problem stated

Literature review-

A **literature review** is an overview of the previously published works on a specific topic. The term can refer to a full scholarly paper or a **section** of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

Producing a literature review is often a part of graduate and post-graduate student work, including in the preparation of a thesis, dissertation, or a journal article.

Why write a literature review?

When you write a thesis, dissertation, or research paper, you will have to conduct a literature review to situate your research within existing knowledge. The literature review gives you a chance to:

- Demonstrate your familiarity with the topic and scholarly context
- Develop a theoretical framework and methodology for your research
- Position yourself in relation to other researchers and theorists
- Show how your research addresses a gap or contributes to a debate

You might also have to write a literature review as a stand-alone assignment. In this case, the purpose is to evaluate the current state of research and demonstrate your knowledge of scholarly debates around a topic.

The content will look slightly different in each case, but the process of conducting a literature review follows the same steps.

There are five key steps:

1. **Search** for relevant literature
2. **Evaluate** sources
3. **Identify** themes, debates and gaps
4. **Outline** the structure
5. **Write** your literature review

A good literature review doesn't just summarize sources—it analyses, synthesizes, and critically evaluates to give a clear picture of the state of knowledge on the subject.

What is a research gap?

Let us begin with understanding what a research gap means. When you read papers or books on topics of your interest, you may realize there are some areas that have significant scope for more research but they have not been tapped by other researchers. In other words, no one has picked up or worked on these ideas. A research gap or a literature gap refers to such unexplored or underexplored areas that have scope for further research.

Here are 6 tips to identify research gaps:

1. Look for inspiration in published literature

- Read books and articles on the topics that you like the most. This will not only help you understand the depth of work done by researchers in your field but also provide an opportunity to ask questions that can lead you to a research gap.

- While reading research articles, you can focus on the Introduction section where the authors explain the importance of their research topic and the gaps they have identified and attempted to fill through their research. Also, look at the directions or suggestions for further research that the authors have made as that could be highly inspiring.
- Read meta-analyses and review papers to learn more about the developments and trends in research over the years in the area of your liking. This will help you get acquainted with the problems that have been researched upon in the past as well as trending queries on those topics that you find interesting.

2. Seek help from your research advisor

- Discuss the issues and problems in your field with your research advisor to generate ideas for research. Articulating your ideas and knowing what others think and are working on may help you identify your study area or even identify mistakes in your approach. If you think a question would be interesting to work on, you can discuss it with your advisor and get their suggestions.

3. Use digital tools to seek out popular topics or most cited research papers

- To familiarize yourself with the trending queries in your field, you can use digital tools as they can save time and help you cast a wider net in your search for a research gap. Websites like Essential Science Indicator that identify the most cited papers in a field along with the emerging branches, influential contributors, publications, and countries in that field can be immensely useful to know which topics are considered important. You can also use Google Trends to learn more about the popular questions related to your research area. This will ease your search for an untapped area in your research field.

4. Check the websites of influential journals

- The websites of prominent journals often have a section called ‘key concepts’ where experts in an area highlight the central ideas in that field. Reading through this section can help you gain a lot of insights and generate new ideas as well. Moreover, you should also look through the reference section of these papers as it can lead you to important resources on the topic.

5. Make a note of your queries

- It is a good practice to note all the questions that cross your mind while reading any published literature. If possible, you should map the question to the resource it is based on. "Keep track of what the authors told you and the questions that occur to you whenever you read anything - an article, a book, a book chapter, a dissertation, etc." advises Nadine Anderson, Behavioral Sciences and Women's and Gender Studies Librarian at the University of Michigan. She says that this will also help in ensuring that there is no unintended plagiarism in your research paper. You can use tables, charts, pictures, or tools to maintain a record. This can help you in the long run when you are developing your idea into a research problem or even when writing your manuscript.

6. Research each question

- Once you have a list of questions that could be explored, you must conduct thorough research on them. What does this mean? Read more about each doubt or query that you have. Find out if other researchers have had similar questions and whether they have found answers to them. This will help you avoid duplication of work.

What is Research problem?

A research problem is a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. In some social science disciplines the research problem is typically posed in the form of a question. A research problem does not state how to do something, offer a vague or broad proposition, or present a value question.

The purpose of a problem statement is to:

Introduce the reader to the importance of the topic being studied. The reader is oriented to the significance of the study and the research questions or hypotheses to follow.

Places the problem into a particular context that defines the parameters of what is to be investigated.

Provides the framework for reporting the results and indicates what is probably necessary to conduct the study and explain how the findings will present this information.

How to identify a research problem?

After choosing a specific topic for your academic paper, you need to state it as a clear research problem that identifies all the issues that you'll address. It's not always simple for students to formulate it. In some fields, they may end up spending a lot of time thinking, exploring, and studying before getting a clear idea of what research questions to answer.

Some research paper topics are too broad to give a researchable issue. For example, if you decide to study certain social issues, like child poverty, remember that they don't provide any researchable question. These are very broad to address and take a lot of time and resources to become unfeasible so that your study will lack enough focus and depth.

After doing this 3 steps, we can do our research.

Framing research questions and hypothesis

Research questions-

research question is 'a question that a research project sets out to answer'. Choosing a research question is an essential element of both quantitative and qualitative research. Good research questions seek to improve knowledge on an important topic, and are usually narrow and specific.

How to frame a hypothesis from research question ?

A hypothesis by definition is a proposition or a number of propositions that reflect a prediction. In simpler words, a hypothesis is a statement that assumes a relationship between an independent variable and a dependent variable. In research, hypotheses provide the basis for data collection and data analysis. The data analysis is essentially applications of research tools and techniques to prove or disprove the hypothesis. However, before testing, it is important to frame the hypotheses properly. This sometimes poses a challenge.

Need for framing a hypothesis from research questions

Not all types of research require a hypothesis. The need for framing a hypothesis stems from the research questions and the research methodology. It depends on the research approach, research type, and research method. Framing a hypothesis is essential in cases:

When the research type was descriptive-

Descriptive research is the one that aims to collect information and analyse it statistically to draw conclusions. For example, let a primary study want to investigate the effects of organizational factors on job satisfaction of employees. Moreover, several organizational factors identified in the literature review are: remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and, scope of promotion. The hypothesis, in this case, will test the effect of these factors on job satisfaction of employees.

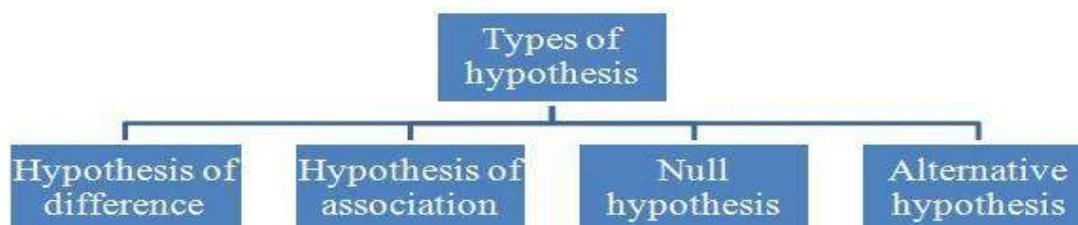
When the research approach is deductive-

A deductive approach of research emphasizes causality and aims test a theory with the help of a hypothesis. Suppose one wants to examine the Economic theory of export-led growth. This theory states that a country can achieve an accelerated rate of growth by relying on the expansion of exports. There are several factors such as foreign direct investment (FDI), trade openness, exchange rate, bilateral and multilateral trade agreements among others that the literature identifies as related to export expansion. In this case, the hypothesis will be framed to determine the effects of these factors on the growth rate.

When the research method is quantitative-

A quantitative research method is the one that is based on the measurement of variables. It useful to assess the effect of GDP and the current account deficit of a country on its fiscal deficit. GDP, current account deficit and fiscal deficit all are measured and published in monetary units. The hypothesis, in this case, will be framed to measure the effect of GDP and CAD on the fiscal deficit.

Types of hypothesis -



A hypothesis can be stated in a number of ways. Consider the example research on student performance (grades) in relation to counselling. These are the types of hypotheses that depend on the objective of the study.

- **The hypothesis** of difference. There is a significant difference between the average performance of students who receive counselling and those who do not.

- The hypothesis of association. There are equal numbers of students in the classroom who receive counselling and who do not receive counselling.
- **Null hypothesis.** There is no relationship between counselling and the grades received by students in the classroom.
- **Alternative hypothesis.** There is a significant relationship between counselling and the grades received by students in the classroom.

Furthermore, if the research predicts that there is a significant relationship between counselling and student performance. The alternative hypothesis reflects this prediction. The null hypothesis is framed in such a way that it can be refuted to confirm the alternative hypothesis.

Format of a hypothesis

Consider the example of organizational factors and job satisfaction mentioned above.

- Make a flow chart before framing the hypotheses. This is called a conceptual framework and it helps in framing the hypotheses in a systematic way. In the conceptual framework, list the independent variables or the factors on the left-hand side. The dependent variable 'job satisfaction' should be on the right-hand side. Use an arrow in between. The directionality of the arrow should be from the independent variables to the dependent variable.
- Following the conceptual framework, the independent variables should come on the left-hand side of the hypothesis. The dependent variable should be on the right-hand side of the hypothesis.
- Include words like 'impact', 'influence', 'effect', 'relationship' or 'association' within the hypothesis. This is to indicate what tests can be used in testing it.
- Use notation H_0 to denote the null hypothesis.
- Use notation H_A to denote the alternative hypothesis.

Following the above rules, the null and the alternative hypotheses in case of the above example are:

H_0 : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have no effect on the job satisfaction of employees.

H_A: Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have a significant effect on the job satisfaction of employees.

Steps for constructing a hypothesis

- The first step before constructing a hypothesis is a thorough review of existing literature on the topic of research.
- After the literature review, identify gaps in the literature. Then narrow down the research problem to fulfill the gap.
- The research problem needs to be stated in terms of research objectives or research questions.
- Following the research question, identify the dependent and the independent variables.
- Frame statements or hypotheses that reflect a prediction and are testable.
- The results of hypothesis testing directly help to answer the research questions and draw conclusions for the study.

Important points

While framing hypotheses, these are the important points one needs to remember.

- The hypothesis should be precise and clear.
- It should be stated in simple terms.
- The hypothesis should propose a relationship between two variables or a set of variables namely dependent and independent variables.
- The scope of the hypothesis should be specific and narrow.
- The hypothesis should conform to the research questions.
- It should be consistent with the findings of the previous researches or facts that are known and established.
- The hypothesis should be testable with primary or secondary data.
- The results of hypothesis testing should address the study's aim and objectives adequately.

Selecting study area and target population

Selecting study area-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work” ideally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

Target populations-

Before research can begin the target population must be identified and agreed upon. The target population is the entire population, or group, that a researcher is interested in researching and analysing. A sampling frame is then drawn from this target population. For example, if the research was to identify approximately how many parents read a particular article in their child’s school newsletter, the target population would be all parents of children at that school. The target units would then be the individual parents, and the school could provide a list of parent contact details which would serve as a sampling frame.

Identifying and collecting relevant secondary data

Secondary Data- Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

Data classified as secondary for particular research may be said to be primary for another research. This is the case when data is being reused, making it primary data for the first research and secondary data for the second research it is being used for.

Steps of collecting secondary data-

1. **Termining your research question** – As indicated above, knowing exactly what you are looking for
2. **Locating data**– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.

3. **Evaluating relevance of the data** – Considering things like the data's original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. **Assessing credibility of the data** – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.
5. **Analysis** – This will generally involve a range of statistical processes as discussed in Chapter 13.

Survey schedule and questionnaire

- The research process is incomplete without the collection of data, which starts after the identification of the research problems and chalking out research design.
- There are several methods involved in the collection of primary data, like observation, interviews, questionnaires, schedules, etc.
- Both questionnaire and schedule are popularly used methods of collecting data in research surveys.
- There is much resemblance in the nature of these two methods and this fact has made many people to remark that from a practical point of view, the two methods can be taken to be the same.
- But from the technical point of view, there are many differences between the two common methods of data collection.

Similarities between survey and questionnaire-

- Both are set of related items having questions relating to a central problem.
- Both use mainly structured questions and these questions are so phased and interlocked that they have a built-in mechanism for testing the reliability and validity of the response.
- In both the same set of questions is administered to all the respondents and comparable results are obtained.
- Both these instruments have to be used with the same general principles of designs and have to take into account the same problems and basic difficulties they have to be limited in length.
- In both, the central problem has to be concentrated upon the following considerations involved in the problem of evolving the questionnaire and a schedule as a unit.
- Drawing the respondent into a situation through awake and interest.
- Proceeding from simple to complex questions.
- No early and sudden request for information of a personal and embracing intimate nature.
- Not asking embarrassing questions without giving the respondent an opportunity to explain himself.
- Moving smoothly from one item to another.
- In both certain types of questions have to be eliminated such as vague and ambiguous questions, emotionally charged questions, loaded and leading questions, questions

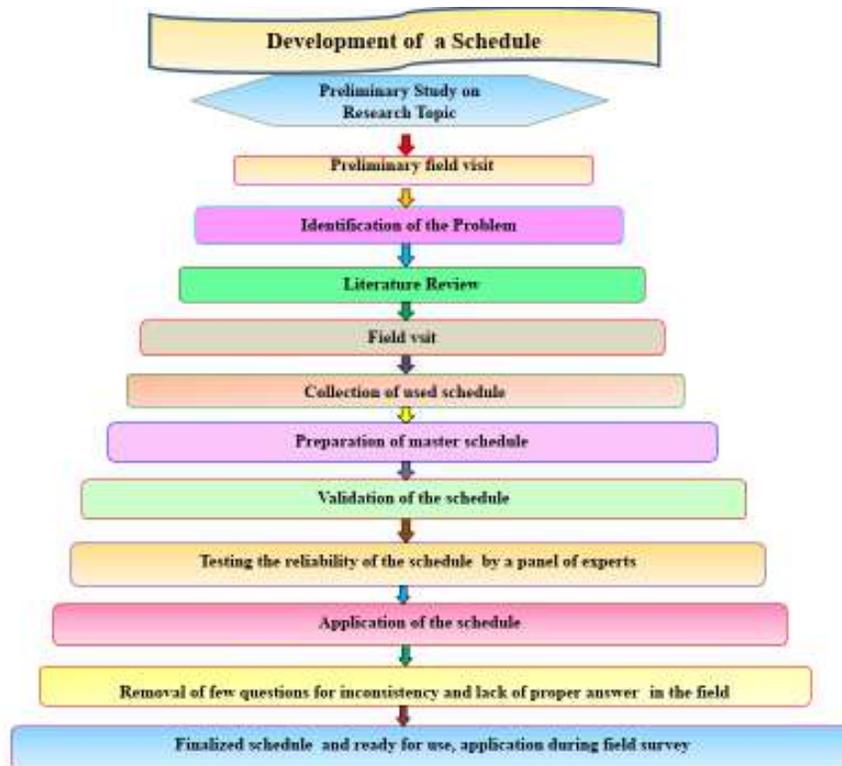
eliciting no response and questions having a structured response to the queries, violence to the existing facts.

- In both pilot studies and pre-tests are necessary for formulating the instrument and for bringing them to the final form. They have to go through the same stages of development.

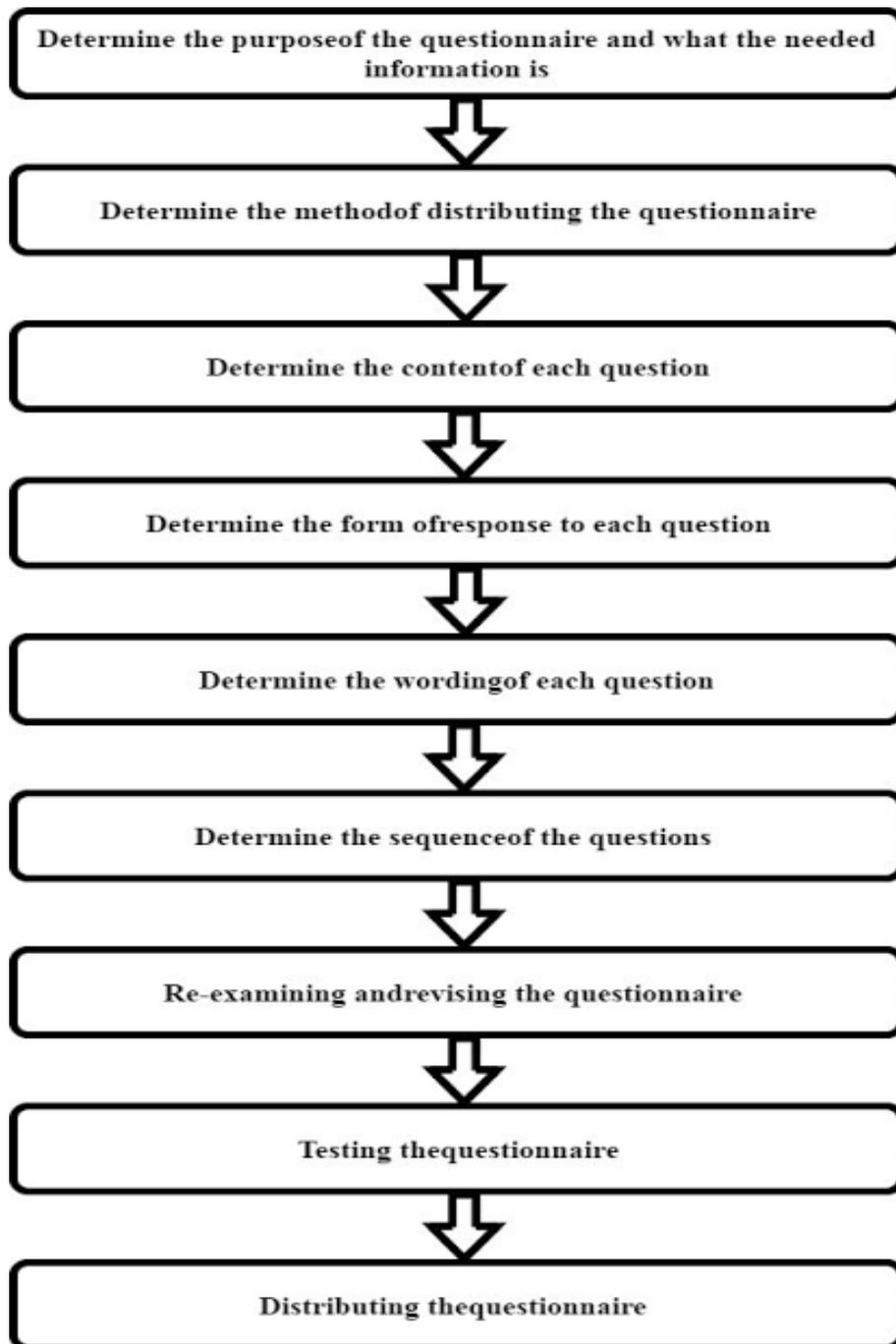
Differences between survey schedule and questionnaire -

- The questionnaire refers to a technique of data collection which consists of a series of written questions along with alternative answers.
- The schedule is a formalized set of questions, statements, and spaces for answers, provided to the enumerators who ask questions to the respondents and note down the answers.
- While a questionnaire is filled by the informants themselves, enumerators fill the schedule on behalf of the respondent.

Prepare a schedule-



Prepare a questionnaire-



ISSUES ON FIELD RESEARCH

PILOT STUDY BASED ON QUESTIONNAIRE

Definition: A pilot study is a preliminary small-scale study that researchers conduct in order to help them decide how best to conduct a large-scale research project. Using a pilot study, a researcher can identify or refine a research question, figure out what methods are best for pursuing it, and estimate how much time and resources will be necessary to complete the larger version, among other things.

Process of Piloting a Survey Questionnaire

- **Selecting the pilot sample:** For large or complex surveys, it is a good idea to do a full pilot before starting actual data collection. To do a pilot a researcher need to test all the survey steps from start to finish with a reasonably large sample. The size of the pilot sample depends on how big the actual sample of the researcher is, and how many data collectors the researcher has. For a typical baseline or endline survey a sample of around 30-50 people is usually enough to identify any major bugs in the system.
- **Implementation of all the steps from start to finish:** The researcher will start by training his data collectors, if he has them. Then the researcher will distribute and collect the survey, after which he will enter the completed surveys into the database that he has planned to use and will test the analysis that he has planned to perform.
- **Making improvements:** Assuming that the survey was pretested, piloting will normally identify practical problems with implementation, rather than problems with the survey design. For example, lack of staff training, challenges with the logistics of distributing and collecting the survey, or errors in data entry. These can then be fixed before the researcher do the actual survey.

Advantages of Conducting a Pilot Study:

Pilot studies are useful for a number of reasons, including:

- Identifying or refining a research question or set of questions
- Identifying or refining a hypothesis or set of hypotheses
- Identifying and evaluating a sample population, research field site, or data set
- Testing research instruments like survey questionnaires, interview, discussion guides, or statistical formulas
- Evaluating and deciding upon research methods
- Identifying and resolving as many potential problems or issues as possible
- Estimating the time and costs required for the project
- Gauging whether the research goals and design are realistic
- Producing preliminary results that can help secure funding and other forms of institutional investment

After conducting a pilot study and taking the steps listed above, a researcher will know what to do in order to proceed in a way that will make the study a success.

ETHNOGRAPHIC FIELD DIARY

Ethnographic data is collected in a variety of ways that involve the researcher being embedded in the field in a variety of ways. Ethnographers collect data by observing in the field. This includes both structured and unstructured observations, along with participant observations. In addition, ethnographers engage in formal and informal interviews and focus groups with subjects. Often researchers will engage in a variety of methods for one research project and this data collection will occur over a period of time. An ethnographer may spend days, months or even year in one **field site** to observe an interview research subject. A field site is the location on the environment an ethnographer is studying. It can be virtually any place- a school, workplace, community, home, street and even in the online world. This **triangulation** of ethnographic methods- using a variety of methods in a field site--- help the researcher to gather as much data as possible to identify trend, patterns and nuances of the field they are studying.

As a result of the intensive data collection method that ethnographers engage, researchers often end up with a good deal of data to analyze. It is therefore important for ethnographers to have a plan on exactly they will collect their data before they head into the field.

LONGITUDINAL STUDY

Definition: A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

Working procedure of Longitudinal Study:

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

. Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Benefits of Longitudinal Study:

A longitudinal study can provide unique insight that might not be possible any other way. This method allows researchers to look at changes over time. Because of this, longitudinal methods are particularly useful when studying development and lifespan issues. Researchers can look at how certain things may change at different points in life and explore some of the reasons why these developmental shifts take place.¹For example, consider longitudinal studies that looked at how identical twins reared together versus those reared apart differ on a variety of variables. Researchers tracked participants from childhood into adulthood to look at how growing up in a different environment influences things such as personality and achievement. Since the participants share the same genetics, it is assumed that any differences are due to environmental factors. Researchers can then look at what the participants have in common versus where they differ to see which characteristics are more strongly influenced by either genetics or experience

Drawbacks of Longitudinal Study:

- **Longitudinal Studies Can Be Expensive:** Longitudinal studies require enormous amounts of time and are often quite expensive. Because of this, these studies often have only a small group of subjects, which makes it difficult to apply the results to a larger population.
- **Participants Tend to Drop Out Over Time:** Another problem is that participants sometimes drop out of the study, shrinking the sample size and decreasing the amount of data collected. This tendency is known as selective attrition. Participants might drop out for a number of reasons, like moving away from the area, illness, or simply losing the motivation to participate.

In some cases, this can influence the results of the longitudinal study. If the final group no longer reflects the original representative sample, attrition can threaten the validity of the experiment. Validity refers to whether or not a test or experiment accurately measures what it claims to measure. If the final group of participants is not a representative sample, it is difficult to generalize the results to the rest of the population.

CASE STUDY RESEARCH

Definition: Case study research is that in which the subject of the research is studied within its social, political, organizational, or economic context and it is one of the commonest approaches across the social and management sciences.

Many authors cite Yin, who describes case study research as:

" ... an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, location no. 638-650).

In other words, the subject of the research is comprehensively studied as an example of a real live phenomenon, within the context in which it happens.

How & when is the Case Study method used?

According to Yin (2006), case study research is best applied when the research addresses descriptive or explanatory questions: i.e. what happened, how, and why?

It is also good for describing a situation or phenomenon occurring in the present, where in-depth description is useful and where the researcher does not need to manipulate events.

Yin (2003) identifies three types of case studies:

1. Exploratory: the case study is used to define questions and hypotheses – or to test out a research procedure – for a further piece of research, such as a large-scale survey.
2. Descriptive: the case study is used to describe a particular phenomenon within its context. It can be used to expand on a particular theme unearthed by a survey.
3. Explanatory: the case study explores cause-effect relationships, and/or how events happen.

Only the third of these approaches can stand up as a method in its own right, and not as an ancillary to other quantitative approaches such as surveys or field experiments.

Advantages of the Case Study as a Research Method

- a) Case studies are "real" – they offer a chance to get a snapshot of real life: a rich and thick picture. As such, they are most appropriate for dealing with a subject that is context dependent, complex, unusual, or where there is some ambiguity.
- b) In direct contrast to positivist approaches, which seek to generalise, the case study offers particularity: i.e. the opportunity for a holistic approach without the distraction of too many variables (Gummesson, 2007).
- c) While it offers depth and specificity, case study research also offers breadth and diversity in terms of methods of data collection and analytical techniques. For example, one case study can incorporate surveys, interviews, direct observation, and archival research. This offers the possibility of several different layers of analysis which can reveal several different perspectives, with the added benefit of triangulation of the results.
- d) According to Woodside (2010, pp. 2-3) the usefulness of case study research lies in the fact that it encourages research methods that help measure thinking over an ongoing period, for example by multiple interviews.

- e) It can also be a useful method when the unit of analysis, or the subject under consideration, is a collective entity such as an organisation or a community.

Disadvantages of the Case Study as a Research Method

- a) The most common objection to case study research is that it is insufficiently rigorous. Quite often this criticism relates not to the method as such, but to the way case studies are presented: the author does not leave a clear audit trail detailing his or her research and explaining the conclusions.
- b) Case studies are often seen as a "bolt-on" to a major research project, defining research questions or throwing further light on an issue that has been revealed by a survey. That explanatory research can offer an understanding of a phenomenon is viewed with scepticism by some, on the grounds that a single case study cannot yield a sufficient volume of evidence on which to generalise.

ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

In order to act on the data collection, a researcher will most likely have to engage with his student population and other stakeholders. When approaching students with data collection requests it is important to be aware of certain ethical considerations.

Ethical considerations refer to the ethical practices of how data is collected, stored or shared. These can include securing clear and informed consent, how to safely store data or how to secure permissions to use or share data. Here are some common ethical considerations that a researcher needs to think through before collecting his data:

Informed Consent: Informed consent refers to written consent by a person to participate in any given evaluation activity where private data and information may be collected. A document is typically prepared that outlines the goals of the evaluation, why data is being collected from whom and how, how it will be stored, for how long and who will have access to it. Facilitators or data collectors are required to ensure that participants understand this information and provide informed consent.

Confidentiality and Anonymity: Confidential data refers to information that is connected to a particular individual but kept confidential such as medical or service records. Anonymous data is information that cannot be traced to a particular individual. Both kinds of data may prove useful, but it is important to ensure that participants know if and how the information they provide is either confidential or anonymous.

Clear Communication and Data Sharing: While it is important to have clear processes for collecting data, it is equally important to have clear processes for sharing data. This is especially true when individual data is private and sensitive such as mental health or addiction related information. It is useful to let participants know that any information gathered is aggregated in the analysis process as a way of ensuring privacy of individual data.

PARTICIPATORY RURAL APPRAISAL

Definition

Participatory rural appraisal (PRA) Or participatory learning and action (PLA) is the fieldworkers use of participatory approach. The PRA continues to evolve so fast that no definitions can be final and has to be updated several times. PRA is defined and updated several times by Prof. Robert Chambers. PRA has been described as

and analyse the realities of their lives and condition, and themselves to plan, monitor and evaluate their actions (chambers, 1994).
empower people to share, analyse and enhance their knowledge of life and conditions, and to plan, act, monitor, evaluate and reflect (Chambers, 2004).

PRA is a flexible, low cost and time saving set of approaches and methods used to enable workers to collect and analyze information in terms of past, present and future situations to understand the rural populace and the condition that exists in rural areas which would provide a thorough and comprehensive idea regarding problems, potentials, resources and solutions to formulate realistic development practitioners to achieve the desired goals within specific time (Chambers1992). Participatory approaches like PRA are now becoming a basic approach in rural development and a wide range of examples can be found in the literature for natural resources and communally owned land: resource economics (Pretty and Scoones 1989), resource planning (Scoones and McCracken 1989), and community forestry (Molnar 1989 and Messerschmidt 1991). The use of the PRA also brought forth the adaptability of PRA tools and their use in the research process (Szymanski, et.al 1997). Locally, participatory processes create the possibility for creating linkages between survival strategies, knowledge systems, knowledge network and sustainable livelihoods (Gupta, 1997).

The PLA/PRA approach is used with the following assumptions:

1. Rural communities form active foundation for rural development
2. Communities need committed local leaders to stir up their development
3. Communities have knowledge and information but it needs to be organized
4. Communities have resources but they need to be mobilized. They can introduce projects, acting primarily on their own resources.
5. Community organizations are among the many, which are under utilized resources available for development efforts.
6. External units such as Government technical experts and extension workers, NGOs, and international organizations often can provide substantial technical, financial or managerial assistance that is critical to rural communities.
7. Thus, PLA/PRA brings together on the one hand, development needs defined by the community members and on the other, skills of Government, donor agencies and NGOs. It

integrates traditional knowledge systems and external technical knowledge in the development process.

PRA helps communities to:

- Mobilize their human and natural resources
- Define problems
- Consider previous successes and failures
 - Evaluate priorities and opportunities
 - Prepare a systematic and site specific plan of action (CPA)

The objectives of the PRA

The content included in the PRA are simple and do not require high caliber or mathematical thinking. But require minds which are prepared to accept a new way of learning, a new of doing things and that we have limited knowledge of something. The ultimate aim of PLA/PRA workshop is:

1. To build up a permanent “people first” attitudes in the minds of the participants. To show that “people are capable agents to change their own lives” but require limited out side assistance.
2. To establish a notion of “respect” to the people’s knowledge in the life of professionals and their institutions.
3. To provide simple analytical tools to analyze rural situations.
4. To show some of the analytical tools to the community in the field setting and understand their suitability to farmer situation.
5. To enhance participant’s ability to plan with the community.

PRA TECHNIQUES AND METHODS

The most common methods are the following:

Diagramming, Mapping and Modeling: - transects - maps (resource, social, farm)

venn diagrams - seasonally analysis - historical analysis (time lines, trend lines, activity profiles)

Ranking and scoring - pair wise ranking - matrix ranking - matrix scoring - well-being analysis and wealth ranking - proportional piling –

pie charts (injera charts) Problem analysis - identification and specification - causal chaining - prioritization

Maps and Models – Diagrams

APPLICATION AND USES OF PRA

The PRA is not purely a new method, but is an adoption and development of various other methods/approaches that were developed before it, such as:

1. Andragogy of Education

A well-known expert in education from Brazil, Paulo Freire (1971), gave plenty of critics on the education system that was not participative and did not empower the students. He criticized the conventional education and counseling ways—by referring to it as domestication—as a form of imperialism in the education system. This philosophy of participative education in the system of education and counseling is adopted by the PRA method.

2. The Field of Research and Science

According to Robert Chambers (1992) there are five main trends that decorate the principle method of PRA:

a) **Participatory Action Research**, born from the suggestion of Paulo Freire, stating that the poor can and have the possibility to analyze their own facts and conditions. Recognition of the ability of the village community in analyzing their problems is adopted into PRA;

b) **Agro-ecosystem Analysis**, is a combination between system analysis with ownership system by analyzing space, time and the cause-effect relation, relative values and decision making. The methods that were adopted into PRA from this method are the transek technique (locational trace), mapping, seasonal calendar, Venn diagram (inter-party relations) and ranking matrix;

c) **Applied Anthropology**, created as an effect of the critics to the science of pure anthropology that emphasize more on the comprehension of the community. Applied Anthropology is intended to judge the ability and validity of village community knowledge and to differ between the soul-frame of the outsider with the insider. What PRA adopts from applied anthropology is that studying outside in the fields is a flexible art and not a science that is rigid, the difference between emic (community norms) and ethic (scientific norms), the validity of indigenous technical knowledge of the village community;

d) **Field Research on Farming System**, the focus of attention is in field research participation, because the farmers as the main actors in agriculture are very experienced people that have their own ways to maintain the life of their agricultural system. This method contributes to PRA its yard/garden sketching technique;

e) **Rapid Rural Appraisal/PRA**, developed because of a number of reasons. The first being the increase of disappointment against anti-poverty bias as the result of “village development tourism”. The bias referred to are: spatial bias (people only come to visit villages that are still close to the city, the main roads and village center, and ignore the borderline villages);

project bias (only provide attention and support for villages that are in a project's area); personnel bias (favors men better than women, the elite than the poor, the service users than the non-users, etc.); seasonal bias (preference to visit the villages during the dry season or during harvest time compared to the wet season or time of famine); diplomatic bias (people from the outside do not wish to meet poor people or see appalling conditions that can touch their hearts). All those biases can combine to conceal the worst poverty of all. The second reason is the disappointment of conventional survey methods. For years and in many places, experience has shown that surveys using questionnaire tend to be over-rated, boring and confusing. The data received are often inaccurate. It also takes a long time to report, is boring and difficult to use, which in the end is often abandoned. The third reason is there has been efforts to find a new and better method that is more effective, by empowering the indigenous technical knowledge of the village community as a source of information to analyze and use for the experts from outside.

FOCUS GROUP DISCUSSION

Definition

A focus group discussion involves **gathering people from similar backgrounds or experiences** together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group.

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.
- Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not dominate it, and so that those participants who tend not to be highly verbal are able to share their views.

- Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

POST FIELD TECHNIQUES: METHODS OF REPORT WRITING

The purpose of a field report in the social sciences is to describe the observation of people, places, and/or events and to analyze that observation data in order to identify and categorize common themes in relation to the research problem underpinning the study. The content represents the researcher's interpretation of meaning found in data that has been gathered during one or more observational events.

How to Begin

Field reports are most often assigned in disciplines of the applied social sciences. It is important to build a bridge of relevancy between the theoretical concepts learned in the classroom and the practice of actually doing the work you are being taught to do. Field reports are also common in certain science disciplines but these reports are organized differently and serve a different purpose than what is described below.

Professors will assign a field report with the intention of improving your understanding of key theoretical concepts by applying methods of careful and structured observation of, and reflection about, people, places, or phenomena existing in their natural settings. Field reports facilitate the development of data collection techniques and observation skills and they help you to understand how theory applies to real world situations. Field reports are also an opportunity to obtain evidence through methods of observing professional practice that contribute to or challenge existing theories.

We are all observers of people, their interactions, places, and events; however, your responsibility when writing a field report is to conduct research based on data generated by the act of designing a specific study, deliberate observation, synthesis of key findings, and interpretation of their meaning.

THINGS NEED FOR REPORT WRITING:

- **Systematically observe and accurately record the varying aspects of a situation.** Always approach field study with a detailed protocol about what you will observe, where you should conduct your observations, and the method by which you will collect and record your data.
- **Continuously analyze of observations.** Always look for the meaning underlying the actions you observe. Ask yourself: What's going on here? What does this observed activity mean? What else does this relate to? Note that this is an on-going process of reflection and analysis taking place for the duration of your field research.
- **Keep the report's aims in mind while you are observing.** Recording what you observe should not be done randomly or haphazardly; you must be focused and pay attention to details. Enter the observation site [i.e., "field"] with a clear plan about what you are intending to observe and record in relation to the research problem while, at the same time, being prepared to adapt to changing circumstances as they may arise.

- **Consciously observe, record, and analyses what you hear and see in the context of a theoretical framework.** This is what separates data gatherings from reporting. The theoretical framework guiding your field research should determine what, when, and how you observe and act as the foundation from which you interpret your findings in relation to the underlying assumptions embedded in the theoretical framework.

Photography

With the advent of smart phones, an almost unlimited number of high quality photographs can be taken of the objects, events, and people observed during a field study. Photographs can help capture an important moment in time as well as document details about the space where your observation takes place. Taking a photograph can save you time in documenting the details of a space that would otherwise require extensive note taking. However, be aware that flash photography could undermine your ability to observe unobtrusively so assess the lighting in your observation space; if it's too dark, you may need to rely on taking notes. Also, you should reject the idea that photographs represent some sort of "window into the world" because this assumption creates the risk of over-interpreting what they show. As with any product of data gathering, you are the sole instrument of interpretation and meaning-making, not the object itself.

Field note:

There are two primary type of field note:

1. Descriptive field note:

It provides in depth descriptions and depiction of particular setting and events as well as objectives, activities, behaviours and interactions make up these contexts.

- Description of participants
- Description of setting or context
- Discussion and dialogue
- Accounts of behaviour and activities
- Observers behaviour

2. Reflective field notes:

It contain reflective commentary are often focused on the role of the research in relation to the setting and participation, providing the opportunity for resource.

- Reflective commentary
- Role or stances of the research in relation to the setting and participation
- Ethical dilemmas
- Methodological challenges and obstacles
- revelations and epiphanies

Video and Audio Recordings

Video or audio recording your observations has the positive effect of giving you an unfiltered record of the observation event. It also facilitates repeated analysis of your observations. This can be particularly helpful as you gather additional information or insights during your research. However, these techniques have the negative effect of increasing how intrusive you are as an observer and will often not be practical or even allowed under certain circumstances.

Illustrations/Drawings

This does not refer to an artistic endeavor but, rather, refers to the possible need, for example, to draw a map of the observation setting or illustrating objects in relation to people's behavior. This can also take the form of rough tables, charts, or graphs documenting the frequency and type of activities observed. These can be subsequently placed in a more readable format when you write your field report. To save time, draft a table [i.e., columns and rows] on a separate piece of paper before an observation if you know you will be entering data in that way.

Participant observation:

Participatory observation is a central data collection approach within anthropology and other fields such as sociology, psychology, and education; it involves either formal or informal information observation of setting, activities, and events such as meeting, performance,

PRA

PRA is a process which extends into analysis, planning and action. The World Bank defines PRA as a 'family of participatory approaches and methods which emphasize local knowledge and enable local people to do their own appraisal, analysis and planning. 'PRA uses group animation and exercises to facilitate information sharing, analysis and action among stakeholders.

the principles of PRA are: 1) 'handing over the stick' which means surrendering authority to local people in the learning processes, 2) ability to conduct critical examination by and of facilitators of their own roles, personal responsibility i.e. 'using one's own best judgment at all times', 3) multi way sharing of ideas and information and 4) stimulation of 'community awareness'

Focus Group Discussion (FGD)

FGD Campbell (2008) defines a FGD as "a planned, facilitated discussion among a small group of stakeholders designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment". It is the method of rapid assessment and data gathering in which participants congregate to talk about the specific issues and concern based on a list of key themes drawn up by the researcher/facilitator. The main objective of focus group discussion is to acquire knowledge regarding the particular issue. It can be used to collectively assemble and analyses information for many purposes such as the adoption of a particular innovation, needs assessment (Tipping, 1998), program evaluation. For conducting a focus group discussion, a facilitator and assistant to facilitator are needed. The facilitator leads the group discussion and encourages the participants. The assistant to the facilitator is to take notes, run the tape recorder, respond to the unexpected interruptions, and is always ready to follow the facilitator's mode of action. Knowledgeable, pleasing personality, politeness, ability to speak local language, respect to local norms and behavior, ethics, patience etc. are the main criteria of a good facilitator.

Specific objectives of the FGD exercise this exercise was meant specifically to: 1) Understand the group's perceptions of climate change by identifying and ranking some of the main climate change problems presently under debate. 2) Identify and understand the major cause or triggers of the identified problems 3) Identify and understand some of the possible mitigation and adaptation strategy to Climate change. All these were meant to in effect expose the individual as well as groups perception of the present climate change issue under debate with the use of a FGD.

STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES

Who are stakeholders?

Stakeholders are persons, groups or institutions with interest in the project or programme. Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively. Secondary stakeholders are the intermediaries in the aid delivery process. This definition of stakeholder includes both winners and losers and those involved or excluded from decision making process. Key stakeholders are those, who can significantly influence or are important to the success of the project (ODA, 1995). This wide definition clearly includes ourselves (researchers) and farmers along with other disciplinary categories such as policy makers, extension officers, relevant government & nongovernmental organizations.

The word 'stakeholder' was first recorded in 1708 as 'a person who holds the stake or stakes in a bet' (Ramirez, 2001). In business context, a stakeholder as defined by Freeman (1984) is 'any group or individual who can affect or is affected by the achievement of a corporation's purpose'. However, Röling and Wagemakers (1998), in the context of natural resource management defined stakeholders as 'natural resource users and managers'.

According to ODA (1995) and Allen and Kilvington (2001), there are two types of stakeholders.

i) Primary stakeholders: They are those who are (will be) ultimately affected either positively (e.g., beneficiaries) or negatively (e.g., those involuntarily resettled). They are immediate communities of interest.

ii) Secondary stakeholders: They are the intermediaries in the aid delivery process. They may include government agencies and other institutional bodies. Often these groups do not consider themselves as stakeholders because they feel they own the process.

There is another party called the *Tertiary Stakeholders*. This group consists of those individuals or organizations that do not have any particular 'stake' in the initiative. However, their activities affect the project's functioning and outcome.

What Is Stakeholder Analysis?

A "stakeholder" can be defined as: Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

According to ODA (1995), stakeholder analysis is a tool by which the key stakeholders of a project are identified, their interest in the project is assessed and the ways in which are interest affects project riskiness and viabilities are judged.

Although stakeholder analysis finds its origin to business and managerial science, it is currently used in fields ranging from political science to policy development and international relations (Chevalier, 2001). The concept and related methodology have made significant inroads to poverty reduction studies and applied research pertaining to issues of sustainable livelihood, community based natural resource and conflict management (Ramirez, 1999).

Applications of Stake holder Analysis (SA):

Although SA can be usefully applied to a wide range of policy and management contexts. It is more relevant in complex situations where there are compatibility problems between objectives and stake holders. It is suggested that SA is particularly relevant to natural resource issues where they are characterized by:

- Cross cutting systems and stake holder interests
- Multiple users and users of the resources
- Multiple objectives and concerns
- Temporal trade-offs
- Poverty and under representation
- Market failure

Steps in Stakeholder Analysis:

There are eight major steps in the process:

- 1. Planning the process:** The first step in conducting a stakeholder analysis is to define the purpose of the analysis, identify the potential users of the information, and devise a plan for using the information. A discussion of these issues should be led by the “sponsor,” or initiator, of the stakeholder analysis.
- 2. Selecting and defining a policy:** For a stakeholder analysis to be useful, it must be focused on a specific policy or issue. Again, policy is used in this document to refer to any national, regional, local, or institutional project, program, law, regulation, or rule. In most cases, the sponsor of the stakeholder analysis will have identified a policy, but it is important to ensure that the policy in question is an appropriate topic for a stakeholder analysis before the process begins.
- 3. Identifying key stakeholders:** Identifying the key stakeholders is extremely important to the success of the analysis. Based on the resources available, the working group should decide on the maximum number of stakeholders to be interviewed.
- 4. Adapting the tools:** Generally, very little secondary information is available on stakeholders. As a result, the working group should plan to interview the priority stakeholders identified to gain accurate information on their positions, interests, and ability to affect the process.
- 5. Collecting and recording the information:** Before beginning the interviews, the working group should gather and review secondary information on the priority stakeholders. It should

include any statements regarding the stakeholders' positions on the policy, any goals or objectives of the organizations the stakeholders represent.

6. Filling in the stakeholder table: This step of the process involves taking detailed and often lengthy answers from the interviews and arranging them into a more concise and systematized format.

7. Analyzing the stakeholder table: Once the stakeholder table is complete, the information needs to be "analysed." Such an analysis should focus on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests, positions, and possible allies regarding the policy in question.

8. Using the information: Using the information generated by the preceding analysis is an integral part of the stakeholder analysis process.

Benefits/Advantages of stakeholder analysis:

- Identity stakeholders with conflicting interest and provide opportunity for finely adoption of conflict resolution strategies.
- The opinions and views of powerful and influential stakeholders serve as valuable inputs.
- The support and co-ordination of stakeholders are ensured.
- Ensure resource mobilization (both in terms of financial and non-financial).
- Help to identify relations between stakeholders who can be built upon and may enable 'Coalition' of project sponsorship, our-ship and co-operation.
- Identify stakeholders who are sources of risk as threat to the project.
- Identify stakeholders who need empowerment through capacity building or institutional building.
- Help to assess the appropriate type of participation by different stakeholders at successive stage of the project cycle.
- Help to avoid allocation of time and resources to unnecessary individuals or organizations.

Limitations of SA:

1. Though a powerful tool for problem analysis and illuminating the interests of underrepresented, it cannot in itself provide answers to problems.

2. SA, mirrors the groupings and interest of society and in itself does not try to make changes.

3. The process of analysis cannot be extended for examining the role of very large number of stake holders.

4. Cannot be tried to quantify stake holders' likely gains and losses, this is inherently qualitative tool and can best be employed as an illustrative aid to decision making.

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OR ANY SECTOR

A SWOT analysis makes it possible to assess the various strengths, weaknesses, opportunities and threats (SWOTs) within an organization or within the agricultural extension system as a whole. This factsheet examines the four elements of SWOT and the process of conducting an analysis. It provides tips for conducting the analysis and a ready-to-use SWOT analysis template. The factsheet concludes by looking at scenarios when a SWOT analysis is most appropriate, as well as its advantages and disadvantages.

What is SWOT analysis?

SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats. Occasionally, it may also be found as a 'WOTS up' analysis or the TOWS analysis. The technique is credited to Albert Humphrey who led a research project at Stanford University in the 1960s and 1970s using data from leading companies involved in long range planning processes.

A SWOT analysis is a planning tool used to understand key factors - strengths, weaknesses, opportunities, and threats - involved in a project or in an organization. It involves stating the objective of the organization or project and identifying the internal and external factors that are either supportive or unfavorable to achieving that objective. SWOT is often used as part of a strategic or planning process, but can be applied to help understand an organization or a situation, and also for decision-making for many different scenarios.

The SWOT framework:

A SWOT analysis process generates information that is helpful in matching an organization or group's goals, programs, and capacities to the environment in which it operates. The 'SWOT' itself is only a data capture exercise - the analysis follows later.

Strengths: positive tangible and intangible attributes, internal to an organization and within the organization's control.

Weaknesses: internal factors within an organization's control that detract from the organization's ability to attain the desired goal. Which areas might the organisation improve?

Opportunities: external attractive factors that represent the reason for an organization to exist and develop. What opportunities exist in the environment, which will propel the organization? Identify them by their 'time frames'.

Threats: external factors beyond the organization's control which could place the organization mission or operation at risk. The organization may benefit by having contingency plans to address them if they should occur. Classify them by their severity and probability of occurrence.

The SWOT process:

Doing a SWOT analysis can be very straight forward, but its strengths lie in its flexibility and experienced application.

- Decide how the information is to be collected and by whom (often a team approach is much more powerful than one person's view).
- Identify appropriate sources of information.
- Gather the information - it's useful to use a template as the basis for exploring the factors and recording the information. See our practical and ready-to-use template below.
- Plot the findings.
- Identify the most important issues.
- Identify strategic options.
- Write a discussion document.
- Disseminate and discuss the findings.
- Decide which activities are a priority in the context of the organisation's goals and values – a possible action plan framework appears below.

The SWOT analysis tips:

Some useful tips for carrying out a SWOT analysis:

1. Collaborate - an analysis that involves multiple perspectives will deliver a better outcome.
2. Use expertise and resources that are already available within the organisation.
3. Use SWOT analysis in conjunction with other techniques, such as PESTLE analysis.
4. Incorporate the analysis into an ongoing process for monitoring changes in the business environment.
5. Try not to get bogged down collecting vast amounts of detailed information without analysing and understanding your findings appropriately.
6. Don't jump to conclusions about the future based on the past or present.

When to use a SWOT analysis:

A SWOT analysis can be used for:

- Workshop sessions.
- Generating ideas and solutions.
- Problem solving.

- Planning.
- Strategic planning (with PESTLE).
- Product evaluation.
- Competitor evaluation (with Porter's five forces).
- Personal development planning.
- Decision making (with Lewin's force field analysis).

For example, using SWOT in a team meeting might include the following steps:

- Invite contributors to participate in the SWOT process.
- Explain the process and establish ground rules.
- Identify strengths.
- Identify weaknesses.
- Identify or list the opportunities and threats – this may well have been identified from a PESTLE analysis previously.
- Establish priorities – from your mission, vision and values work.
- Question each list.

Advantages and Disadvantages of using SWOT analysis:

There are a number of advantages and disadvantages of using the SWOT approach to analysis.

Advantages include:

- ❖ It's a simple four box framework.
- ❖ It facilitates an understanding of the strengths and weaknesses of the organisation.
- ❖ It encourages the development of strategic thinking.
- ❖ It enables senior managers to focus on strengths and build opportunities.
- ❖ It can enable an organisation to anticipate future business threats and take action to avoid or minimise their impact.
- ❖ It can enable an organisation to spot business opportunities and exploit them fully. It's flexible.

Disadvantages include:

- ❖ Some SWOT analysis users oversimplify the amount of data used for decisions – it's easy to use insufficient data.
- ❖ The risk of capturing too much data may lead to 'paralysis by analysis'.
- ❖ The data used may be based on assumptions that later prove to be unfounded.
- ❖ Access to quality internal data sources can be time consuming and politically difficult (especially in more complex organisations – parent company, etc).
- ❖ It lacks detailed structure, so key elements may get missed.
- ❖ The pace of change makes it increasingly difficult to anticipate developments that may affect an organisation in the future.
- ❖ To be effective, the process needs to be repeated on a regular basis.

AGE SEX PYRAMID

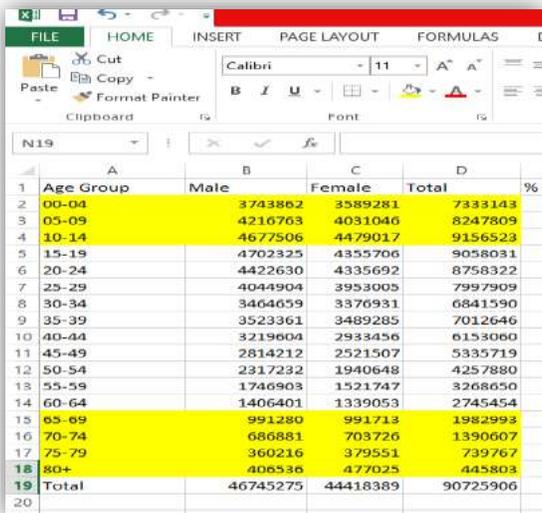
DEFINITION OF AGE SEX PYRAMID

A population **pyramid** or " **age-sex pyramid** " is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically forms the shape of a pyramid when the population is growing.

HOW TO CREATE AGE SEX PYRAMID

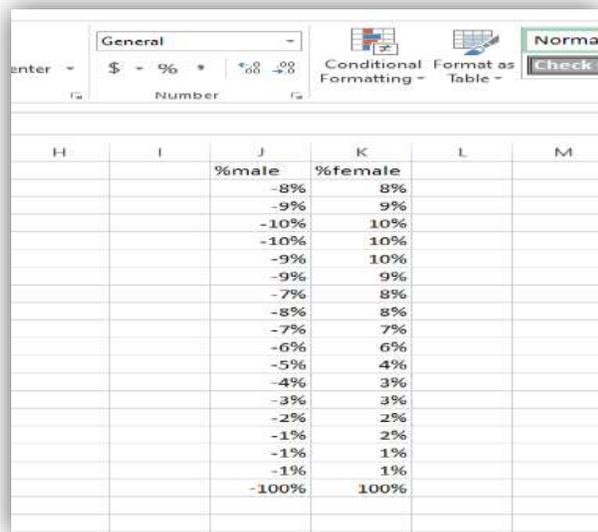
STEPS –

- 1 . First add the data on excel sheet
- 2.calculate the % of the male and female population from the data



The screenshot shows an Excel spreadsheet with the following data:

Age Group	Male	Female	Total	%
00-04	3743862	3589281	7333143	
05-09	4216763	4031046	8247809	
10-14	4677506	4479017	9156523	
15-19	4702325	4355706	9058031	
20-24	4422630	4335692	8758322	
25-29	4044904	3953005	7997909	
30-34	3464659	3376931	6841590	
35-39	3523361	3489285	7012646	
40-44	3219804	2933456	6153060	
45-49	2814212	2521507	5335719	
50-54	2317232	1940648	4257880	
55-59	1746903	1521747	3268650	
60-64	1406401	1339053	2745454	
65-69	991280	991713	1982993	
70-74	686881	703726	1390607	
75-79	360216	379551	739767	
80+	406536	477025	445803	
Total	46745275	44418389	90725906	



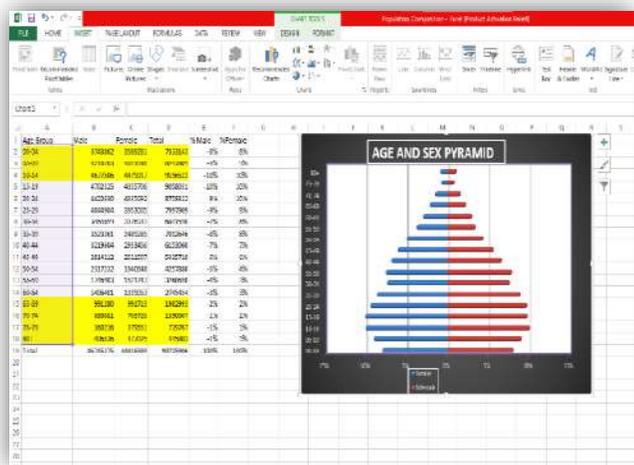
The screenshot shows an Excel spreadsheet with the following data:

	%male	%female
	-8%	8%
	-9%	9%
	-10%	10%
	-10%	10%
	-9%	10%
	-9%	9%
	-7%	8%
	-8%	8%
	-7%	7%
	-6%	6%
	-5%	4%
	-4%	3%
	-3%	3%
	-2%	2%
	-1%	2%
	-1%	1%
	-1%	1%
	-100%	100%

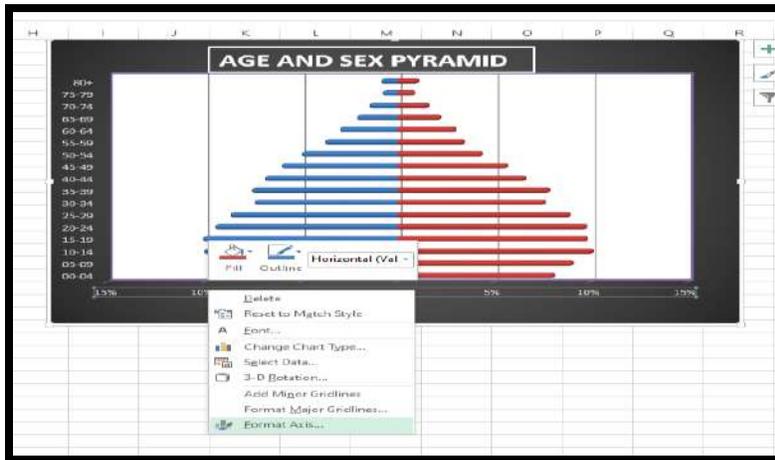
After Calculating the % of the male and female population from the data select the age group with both male and female % population

Age Group	Male	Female	Total	% Male	%Female	%male	%female
00-04	3743802	3585281	7333143	-8%	8%	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%	-9%	9%
10-14	4677306	4479017	9156523	-10%	10%	-10%	10%
15-19	4702325	4335706	9058031	-10%	10%	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%	-9%	9%
30-34	3464059	3376931	6841590	-7%	8%	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%	-5%	4%
55-59	1796903	1521747	3268650	-4%	3%	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%	-3%	3%
65-69	991280	991713	1982993	-2%	2%	-2%	2%
70-74	666881	703726	1390607	-1%	2%	-1%	2%
75-79	360216	379551	739767	-1%	1%	-1%	1%
80+	406536	477025	445803	-1%	1%	-1%	1%
Total	46745275	44418389	90725906	-100%	100%	-100%	100%

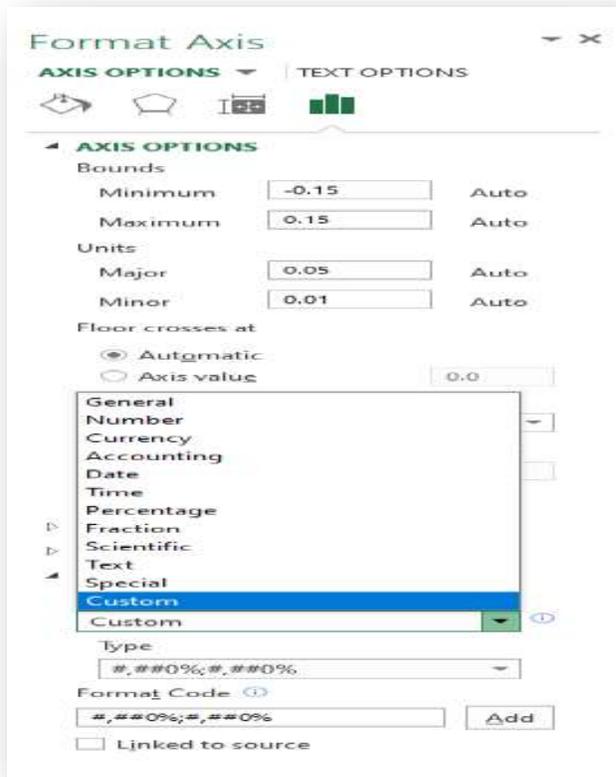
Then go to insert select a suitable bar



1. After your age and sex pyramid was appear then you have to remove [-] Portion from the horizontal plane --- right click on it ----then format axis.

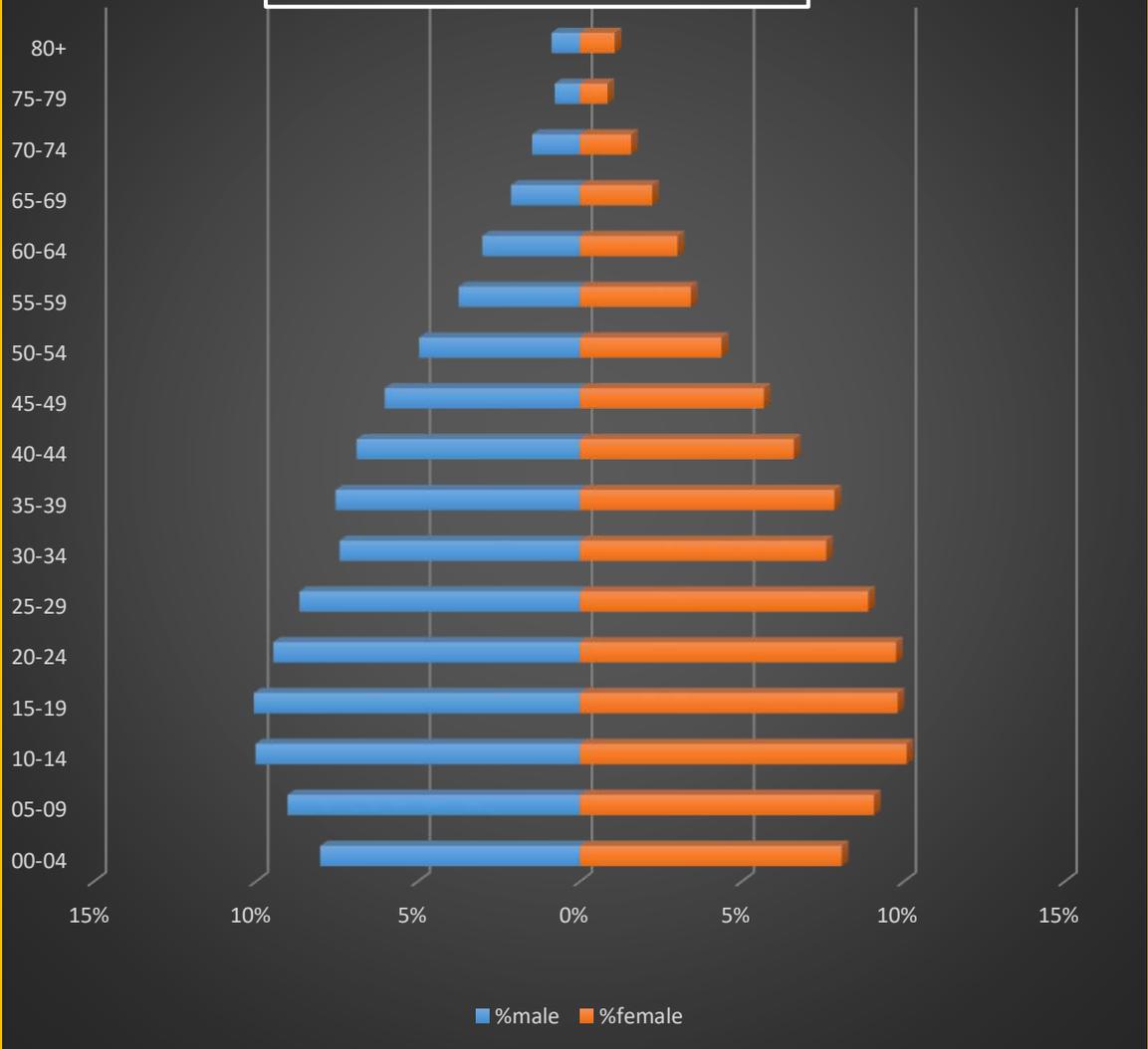


Then this type of tool box was open > go to number> click on customs



1. than this type of tool box was open > go to number> click on customs

AGE AND SEX PYRAMID



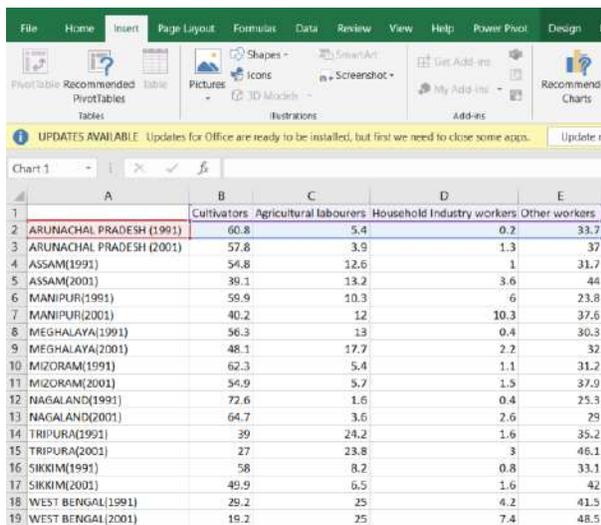
Occupational Structure

What is Occupational Structure?

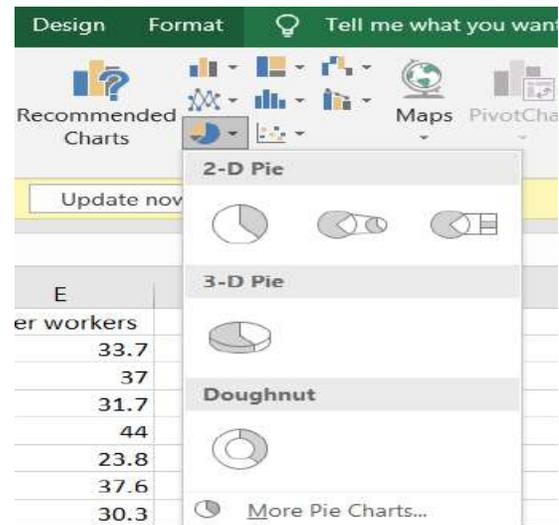
The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a country who are employed in different sectors like agriculture, manufacturing and transport, among many others constitute the occupational structure of a nation.

Steps for occupational structure:

1. At first add the data on excel sheet.
2. Now select the data according to your choice → go to Insert → select recommended charts and click 3a-D Pie → ok.

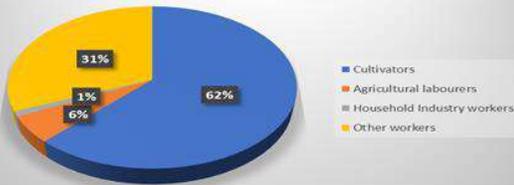


	A	B	C	D	E
		Cultivators	Agricultural labourers	Household Industry workers	Other workers
1					
2	ARUNACHAL PRADESH (1991)	60.8	5.4	0.2	33.7
3	ARUNACHAL PRADESH (2001)	57.8	3.9	1.3	37
4	ASSAM(1991)	54.8	12.6	1	31.7
5	ASSAM(2001)	39.1	13.2	3.6	44
6	MANIPUR(1991)	59.9	10.3	6	23.8
7	MANIPUR(2001)	40.2	12	10.3	37.6
8	MEGHALAYA(1991)	56.3	13	0.4	30.3
9	MEGHALAYA(2001)	48.1	17.7	2.2	32
10	MIZORAM(1991)	62.3	5.4	1.1	31.2
11	MIZORAM(2001)	54.9	5.7	1.5	37.0
12	NAGALAND(1991)	72.6	1.6	0.4	25.3
13	NAGALAND(2001)	64.7	3.6	2.6	29
14	TRIPURA(1991)	39	24.2	1.6	35.2
15	TRIPURA(2001)	27	23.8	3	46.1
16	SIKKIM(1991)	58	8.2	0.8	33.1
17	SIKKIM(2001)	49.9	6.5	1.6	42
18	WEST BENGAL(1991)	29.2	25	4.2	41.5
19	WEST BENGAL(2001)	19.2	25	7.4	48.5

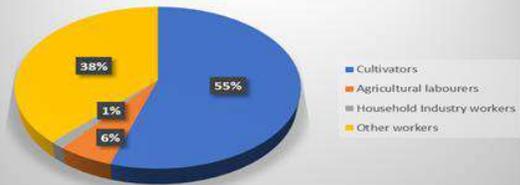


3. After that select the pie diagram → then copy and paste the diagram and merge → save as image → ok.

MIZORAM(1991)



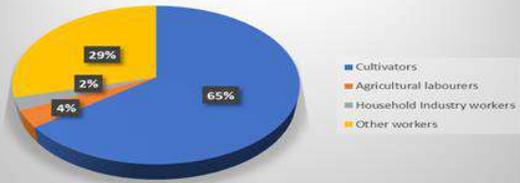
MIZORAM(2001)



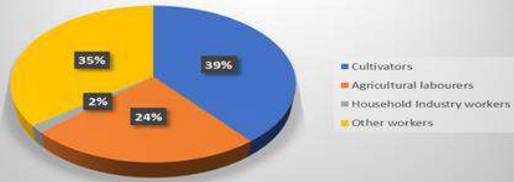
NAGALAND(1991)



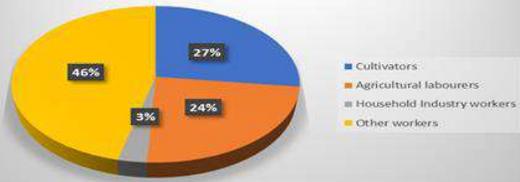
NAGALAND(2001)



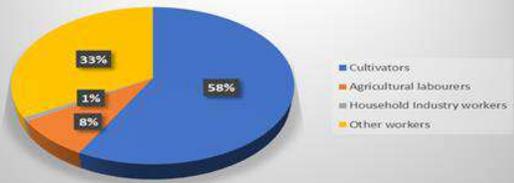
TRIPURA(1991)



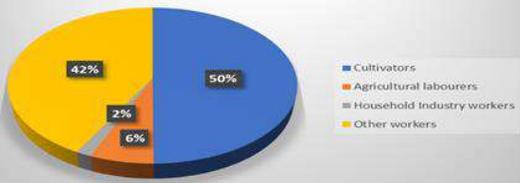
TRIPURA(2001)



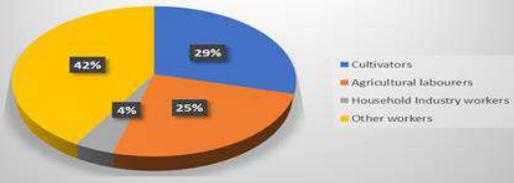
SIKKIM(1991)



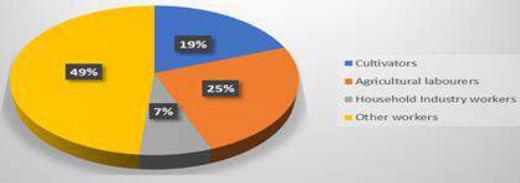
SIKKIM(2001)



WEST BENGAL(1991)



WEST BENGAL(2001)



MIGRATION

MIGRATION DEFINITION

Migration is the progress of people from one place to another, to establish their permanent or semi-permanent residence at the destination. Immigration is an essential component of change, [structure](#), and population growth, as are birth rates and mortality.

There are attraction factors and pushing factors in one place, which influence a person's decision to move. The first are those that attract people to stay, such as low crime rates, pleasant weather, political stability, and excellent employment opportunities. Push factors encourage people to leave the place, such as poverty, war, and floods. [Migration] is usually voluntary, but there are many specific reasons why a person can do it. Sometimes it is forced. Immigration has been a widespread phenomenon throughout the history of humanity; however, nomadic movements are non-migratory, since their purpose is not to settle permanently or semi-permanently in one place. Nor are tourist trips, pilgrimages, and other actions that do not have this end.

Causes

The causes vary, from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area. The roots of [migration] are the following:

Economic Seek employment, start or continue a career, in particular, take advantage of the economic benefits of a specific country, and so on.

Social stay close or live with the family, seek a better quality of lifestyle, and so on.

Policies from persecutions, wars, and other types of problems or political conflicts that put lives at risk.

Cultural improve the quality of [education](#), seek religious affinity or tolerance, taste for the culture of the country, and so on.

Environmental Escape from natural disasters, find a place with a more pleasant climate, and so on.

TYPES OF MIGRATION

1. Internal migration:

Internal migration is a migration that takes place within the borders of a country or territory;

2. External or international migration:

Migration is international when it refers to changes in habitual residence between countries ;

3. "Lifetime" migration:

The "lifetime" migration is defined by relating the place of birth and the place of residence to a reference date. The migrant "life-time" is any individual who resides in an administrative entity other than his or her place of birth.

4. Migrator flows:

Migration flows refer to movements (in and out) of population (nationals and foreigners) that occur at the borders of a given country;

5. Stock of migrants:

Migrant stocks are referred to as the number of migrants (immigrants and emigrants) residing in a country with a certain length of stay, irrespective of the socioeconomic characteristics (migrant workers, refugees, students, etc.) of migrants;

6. Diaspora:

A diaspora is defined both as the dispersion of a people in foreign countries and the formation of a community of that people in those countries;

7. clandestine/irregular migration:

There is "clandestine migration" when a foreigner enters a country without respecting the entry conditions or has entered illegally, remains there beyond the time allowed by law.

LAND USE AND LAND COVER MAPS

The terms land use and land cover are often used interchangeably, but each term has its own unique meaning. Land cover refers to the surface cover on the ground like vegetation, urban infrastructure, water, bare soil etc. Identification of land cover establishes the baseline information for activities like thematic mapping and change detection analysis. Land use refers to the purpose the land serves, for example, recreation, wildlife habitat, or agriculture.

When used together with the phrase Land Use / Land Cover (LULC) generally refers to the categorization or classification of human activities and natural elements on the landscape within a specific time frame based on established scientific and statistical methods of analysis of appropriate source materials. Land cover is the physical material at the surface of the earth. Land use is the description of how people utilize the land for the socio-economic activities.

Reason to use Land use and Land cover maps :-

- LULC maps play a significant and prime role in **planning, management and monitoring programmes** at local, regional and national levels. This type of information, on one hand, provides a better understanding of **land utilization aspects** and on the other hand, it plays an important role in **the formation of policies and programme required for development planning**.
- For ensuring sustainable development, it is necessary to **monitor the on going process on land use/land cover** pattern over a period of time.
- **In order to achieve sustainable urban development** and to **check the haphazard development** of towns and cities, it is necessary that authorities associated with the urban development generate such planning models so that every bit of available land can be used in most rational and optimal way.
- LULC maps also help us to **study the changes** that are happening in our ecosystem and environment and **we can make policies and launch programmes to save our environment**.

LULC classification:-

LULC classification is one of the most widely used applications in remote sensing. The most commonly used approaches include:

Unsupervised classification, supervised classification, Image segmentation, NDVI

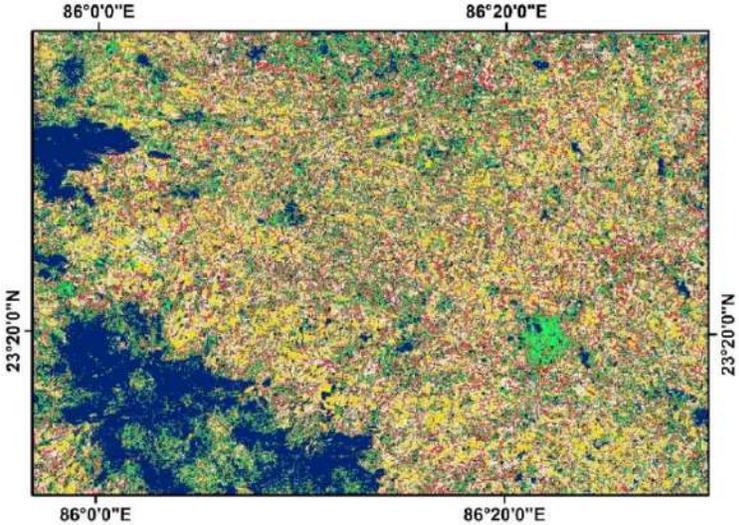
Applications of LULC maps:-

- Natural resource management
- Wildlife habitat protection
- Baseline mapping for GIS input
- Urban expansion / encroachment
- Routing and logistics planning for seismic / exploration/resource extraction activities
- Damage delineation (tornadoes, flooding, volcanic, seismic, fire)
- Legal boundaries for tax and property evaluation. Target detection - identification of landing strips, roads, clearings, bridges, land/water interface.

Steps to create Land use and Land cover Maps :-

Data downloading → Downloading vector data → Downloading ESA Global land cover dataset → Data pre-processing → loading vector data into QGIS → Extracting shape file for chosen area → Adding ESA land cover data to QGIS → clipping ESA Global land cover dataset → Data preparation → Install SCP Plugin in QGIS → QGIS Install Plugin Window → SCP Dock → Import Data → Select Directory SCP Plugin → Creating a Bandset → SCP Bandset Page → SCP Plugin Bandset window with the single band list loaded → Pixel information for each band → Area image before changing band rendering → Create training input → Create classes → Change Band Rendering → Create ROIs → Assess ROIs → Spectral Signature Plot → Run classification → Ground cover classification → SCP land cover change outputs → Layer Properties, Symbology → Land cover change output map

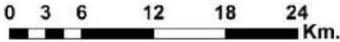
Preparation of a simple landuse map



Legend

Landuse categories

-  Reservoir
-  Vegetation
-  Settlement
-  Marshy land
-  Agricultural land



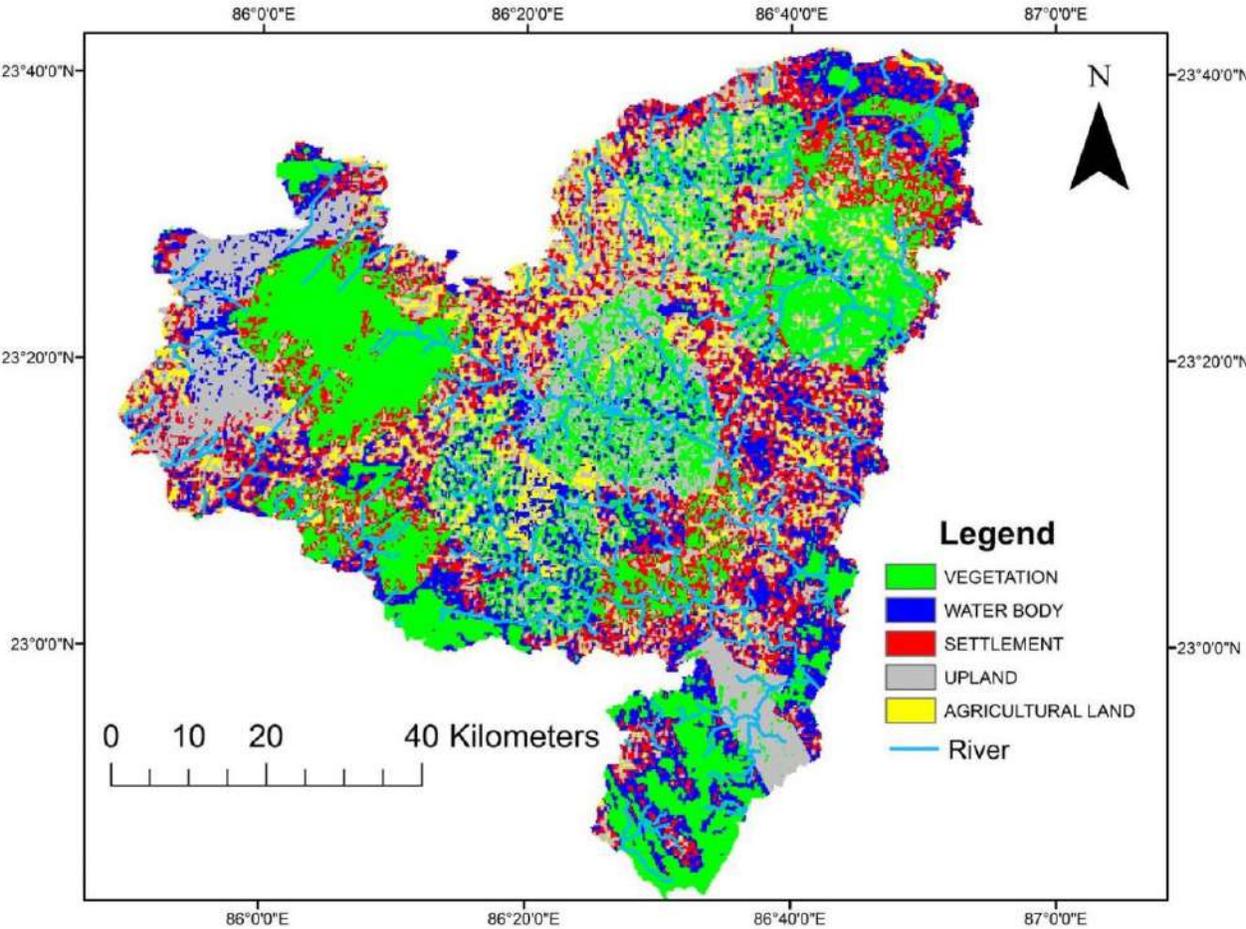
Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation:-

Here in this land use map, there is a reservoir in the north-east side of the area, which is indicated by blue. We can notice, most of this area is covered by agricultural land, which is highlighted by yellow. There are some vegetation in this area which is covered with green. In this area we can see settlement with medium density as red colour. There are marshy land which is noticed very often and this is noticed as grey colour.

We can get a land use and land cover map of Purulia district.

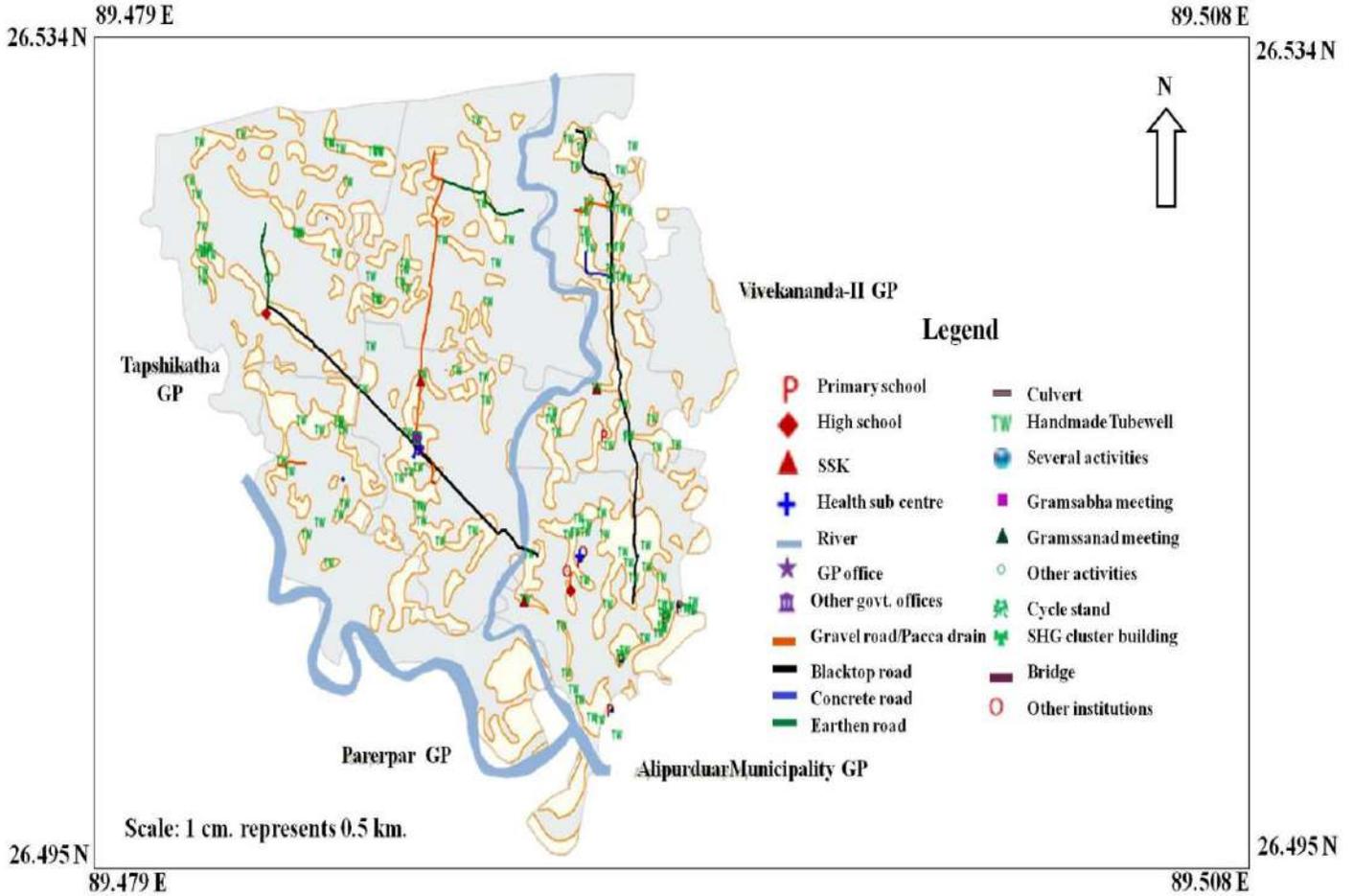
LANDUSE MAP OF PURULIA DISTRICT (2019)



Interpretation:-

In this land use map, there are vegetation in northern part and also in east and north-east, middle side of Purulia, which is high in density and indicated as green. We can noticed reticulated river which is flow from north to east and also some tributary river in the northern side of Purulia district, the river is mentioned by sky blue. There are agricultural land in all over the area of this locality and is highlighted by yellow. In the northern side and eastern side there are upland which is mentioned as grey. There are dense settlement pattern all over the area of Purulia district, this is highlighted in red colour. There are thick water body in north and east part of the area and also some water body can noticed all over the area of this map. The water body is indicated by deep blue.

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation:-

In this planning map of Banchukumari gram panchayet of Alipurduar, we can see a river running from north to east and a tributary river is joined from north-east side of the area. There are four primary school in the east corner. Also there are two high schools and two SSK, health center, GP office, and other government office in the same direction. So we can say that many of these official buildings, education and health sector is located in the east corner of this area. In this block there have pacca drain and gravel road in the middle portion of the area. There are two blacktop road in the middle and east part of this block. Each locality have their own handmade tubewell. There are concrete road in the north and north-east side of this block.

2021

Practical

Note Book

Regional Planning & Rural Development

Saheli Das

Roll: BGC/MGF/SIV/21 NO-324

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GEOPDSE04P

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RESEARCH METHODS AND METHODOLOGY

MEANING OF RESEARCH

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry specially through search for new facts in any branch of knowledge."¹ Redman and Mory define research as a "systematized effort to gain new knowledge."² Some people consider research as a movement, a movement from the known to the unknown. It is actually a voyage of discovery.

OBJECTIVES OF RESEARCH

- The purpose of research is to discover answers to questions through the application of scientific procedures.
- The main aim of research is to find out the truth which is hidden and which has not been discovered as yet.
- Though each research study has its own specific purpose, we may think of research objectives as falling into a number of following broad groupings:
- To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed as exploratory or formulative research studies)
- To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies)
- To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies)
- To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

TYPES OF RESEARCH

Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

There are a variety of approaches to research in any field of investigation, irrespective of whether it is applied research or basic research. Each particular research study will be unique in some ways because of the particular time, setting, environment, and place in which it is being undertaken.

Nevertheless, all research endeavours share a common goal of furthering our understanding of the problem and thus all traverse through certain basic stages, forming a process called the **research process**.

These 8 stages in the research process are;

1. Identifying the problem.
2. Reviewing literature.
3. Setting research questions, objectives, and hypotheses.
4. Choosing the study design.
5. Deciding on the sample design.
6. Collecting data.
7. Processing and analyzing data.
8. Writing the report.

Step – 1: Identifying the Problem

The first and foremost task in the entire process of scientific research is to identify a research problem.

A well-identified problem will lead the researcher to accomplish all-important phases of the research process, starting from setting objectives to the selection of the research methodology.

Step – 2: Reviewing literature

A literature review is a survey of scholarly sources on a specific topic. It provides an overview of current knowledge, allowing you to identify relevant theories, methods, and gaps in the existing research.

Identify literature gap:

After completed literature review researchers should find the gap, also considered the missing piece or pieces in the research literature, is the area that has not yet been explored or is under-explored. This could be a population or sample (size, type, location, etc.), research method, data collection and/or analysis, or other research variables or conditions.

- **RESEARCH PROBLEM**

A research problem is a specific issue, difficulty, contradiction, or gap in knowledge that you will aim to address in your research. You might look for practical problems aimed at contributing to change, or theoretical problems aimed at expanding knowledge.

Step- 3: Setting research questions, objectives, and hypotheses

After discovering and defining the research problem, researchers should make a formal statement of the problem leading to research objectives.

An **objective** will precisely say what should be researched, to delineate the type of information that should be collected, and provide a framework for the scope of the study. The best expression of a research objective is a well-formulated, testable research hypothesis.

A hypothesis is an unproven statement or proposition that can be refuted or supported by empirical data. Hypothetical statements assert a possible answer to a research question.

Step -4: Choosing the study design

The **research design** is the blueprint or framework for fulfilling objectives and answering research questions.

It is a master plan specifying the methods and procedures for collecting, processing, and analyzing the collected data. There are four basic research designs that a researcher can use to conduct his or her study;

1. survey,
2. experiment,
3. secondary data study, and
4. observational study.

Step – 5: Deciding on the sample design

Sampling is an important and separate step in the research process. The basic idea of sampling is that it involves any procedure that uses a relatively small number of items or portions (called a sample) of a universe (called population) to conclude the whole population.

Step-6: Collecting data.

While deciding about the method of data collection to be used for the study, the researcher should keep in mind two types of data viz., primary and secondary. The primary data are those which are collected afresh and for the first time, and thus happen to be original in character. The secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process.

Step-7: Processing and Analyzing Data

The data, after collection, has to be processed and analysed in accordance with the outline laid down for the purpose at the time of developing the research plan. This is essential for a

scientific study and for ensuring that we have all relevant data for making contemplated comparisons and analysis.

Step-8: Writing the report

This is the final steps when researcher write a brief description of the research work, It involves above steps to present the report in the form of thesis or Dissertation.



Focus Group Discussion (FGD)

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.

- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

TECHNIQUES AND FORMULATION OF RURAL PLANNING THOUGHT DATA ANALYSIS

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts.

Strengths

Strengths describe what an organization excels at and what separates it from the competition: a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

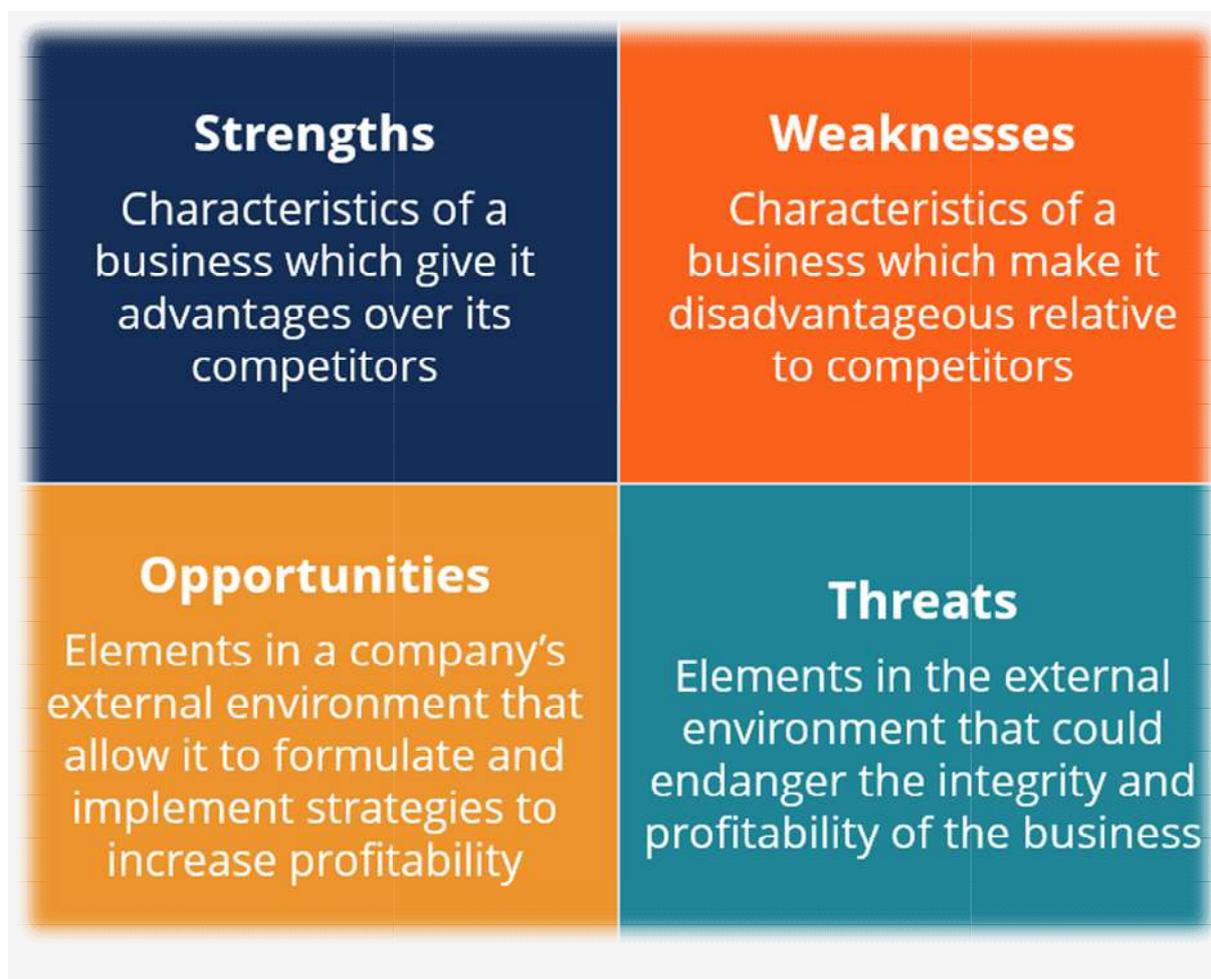
Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favourable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and market share.

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.



Population composition

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

The age structure

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way, people live their lives.

The sex ratio

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population.

In some countries, like U.S.A, the sex ratio is expressed in terms of number of males per thousand females and is calculated by using the formula:

$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of males per thousand females.

In India, the sex ratio is calculated in terms of number of females per thousand males. It is calculated as under

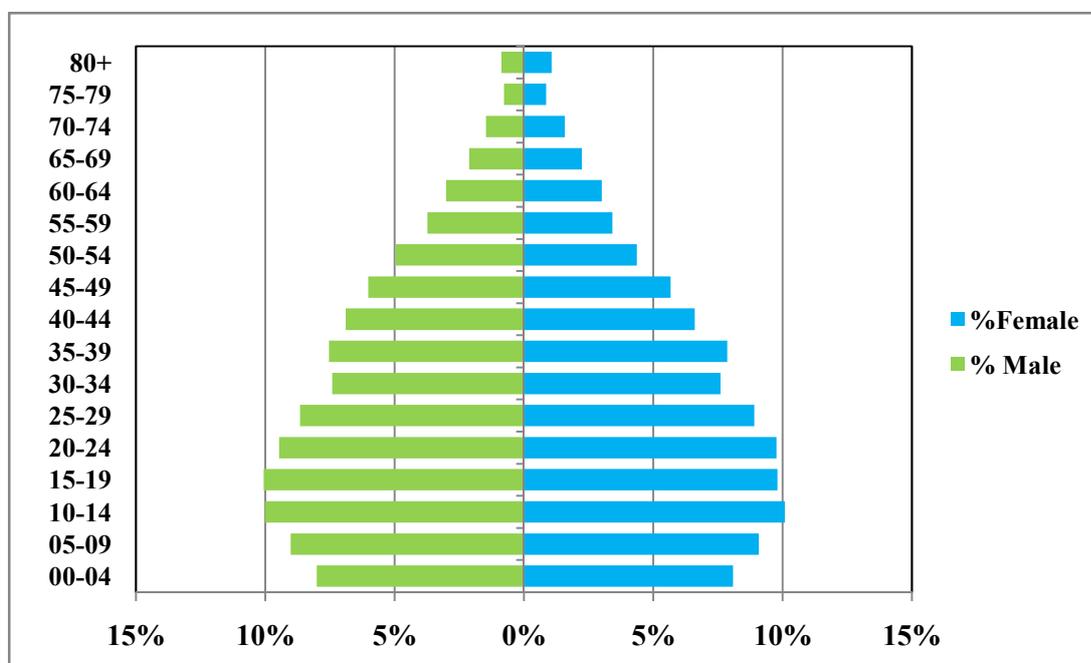
$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of females per thousand males.

Population pyramid

Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

Age-Sex Pyramid

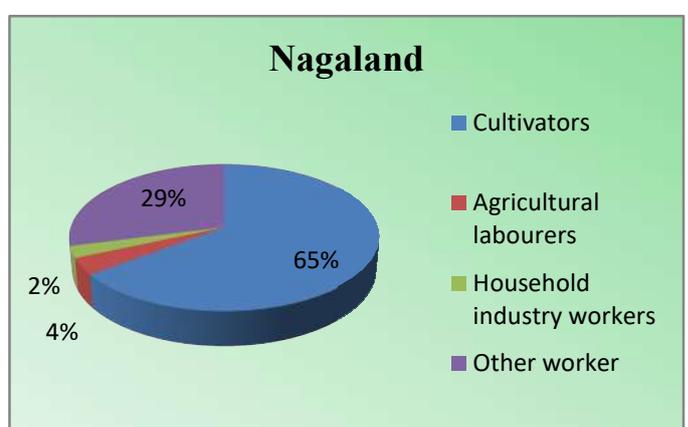
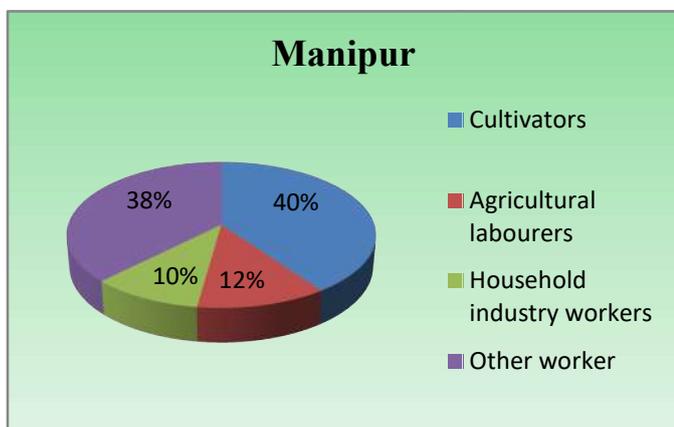
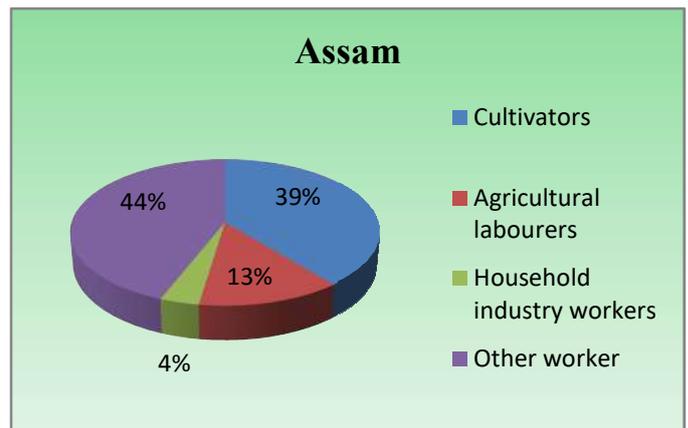
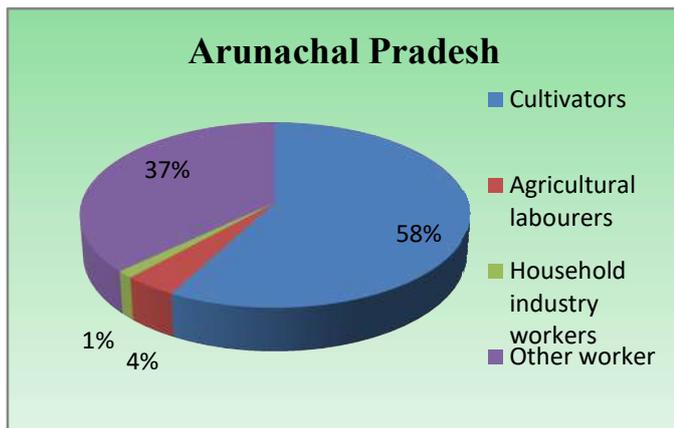


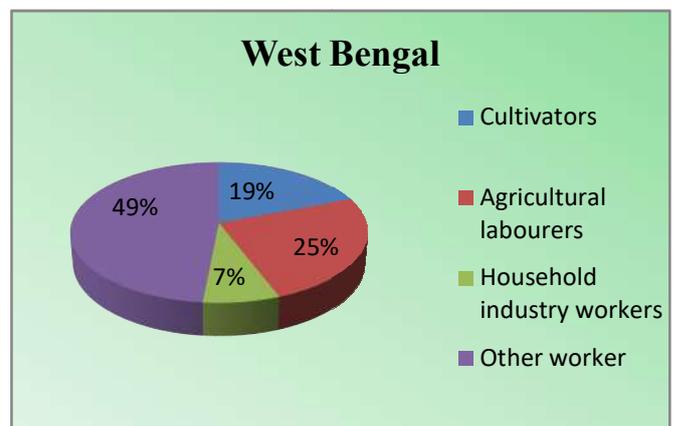
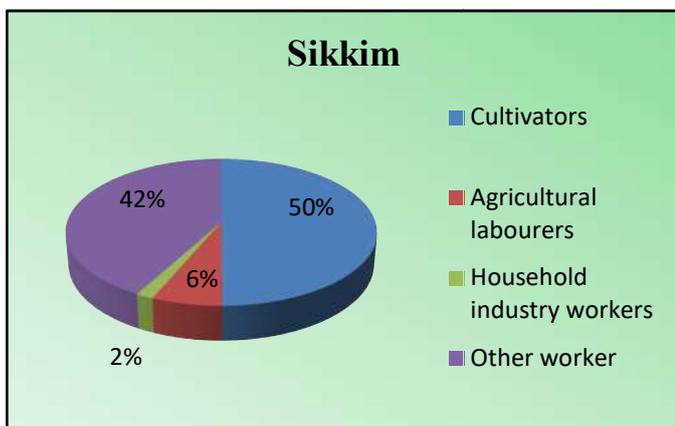
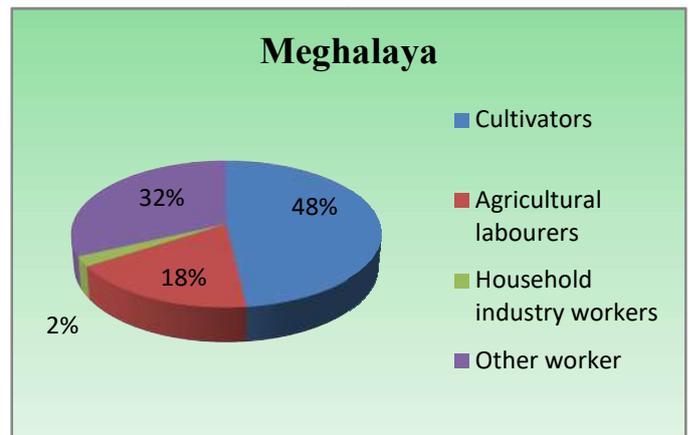
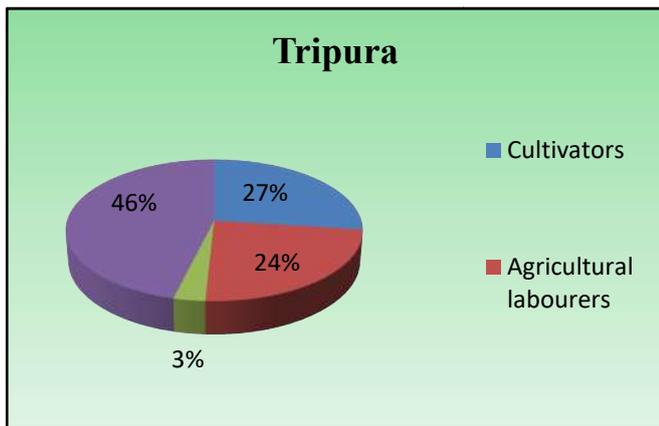
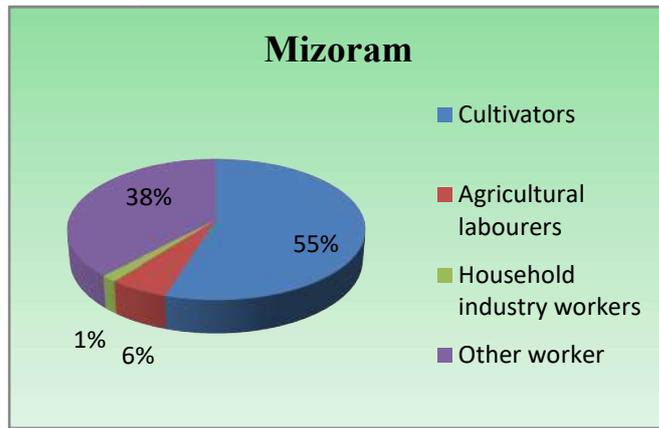
- In this pyramid the bottom heavy i.e. the population has a larger proportion of children, teenagers and young adults.
- The country's population for the age cohorts of 0-4, 5-9, 10-14 and 15-19 is roughly equal, whereas the numbers for older groups become progressively smaller.
- This means that the country's younger age groups have stopped growing in numbers now and are likely to shrink slightly soon.
- Except for the oldest groups, It have more males than females for every cohort.

Occupational Structure

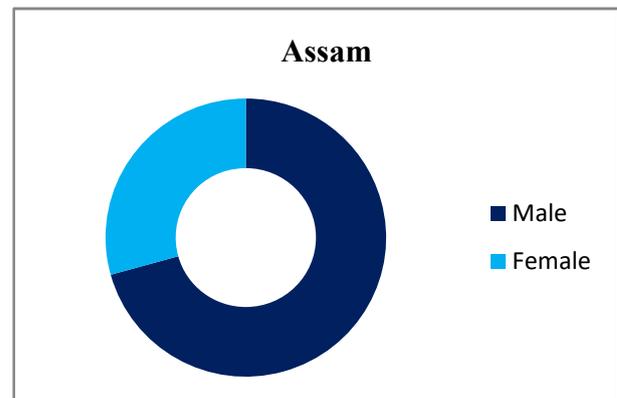
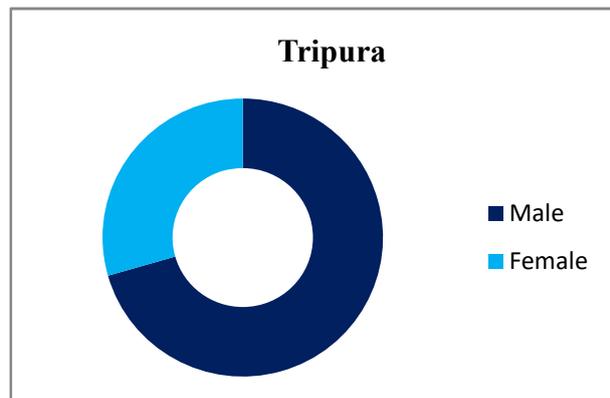
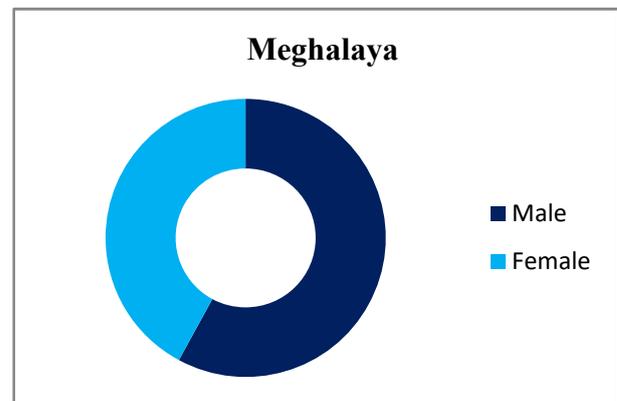
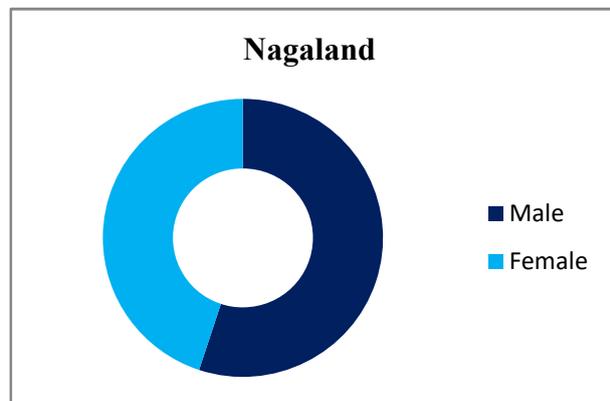
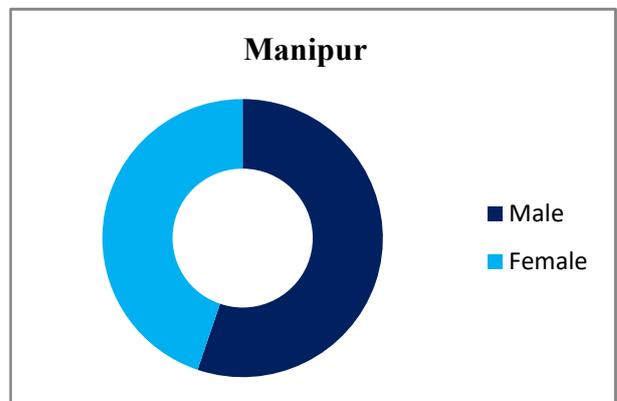
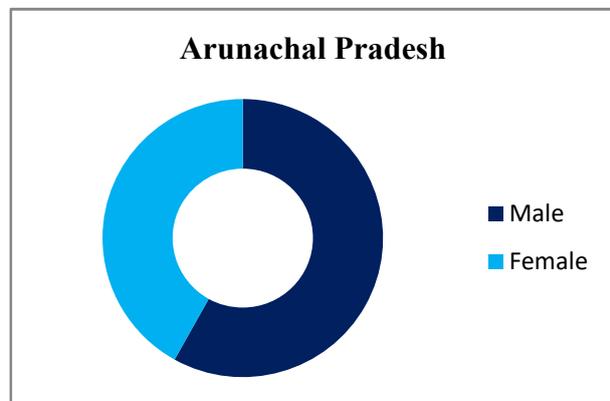
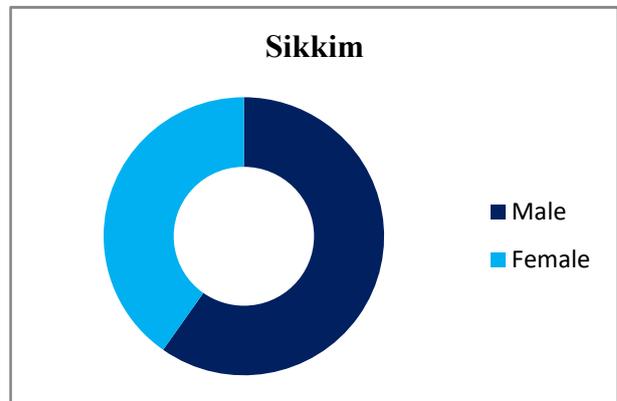
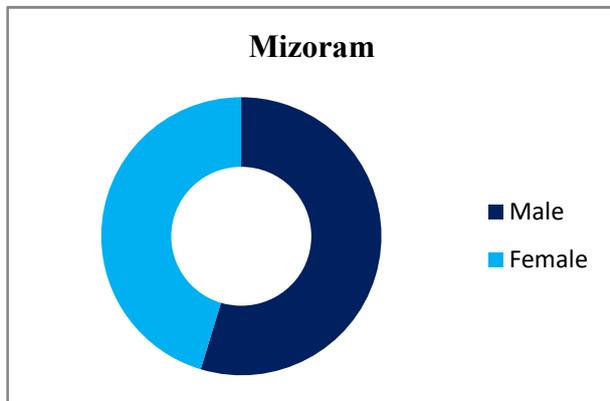
The working population takes place in various occupations ranging from agriculture, forestry, fishing, manufacturing, construction, commercial transport, services, communication and other unclassified services. Agriculture, forestry, fishing and mining are classified as primary activities, manufacturing as secondary, transport, communication and other services as tertiary and the jobs related to research and developing ideas as quaternary activities. The proportion of working population engaged in these four sectors is a good indicator of the levels of economic development of a nation. A developed economy with industries can accommodate more workers in the secondary, tertiary and quaternary sector. If the economy is in primitive stages, then the proportion of people engaged in primary activities would be high

PIE Diagram Showing Distribution Of Workers By Category Of Workers





WORK PARTICIPATION RATE NORTH-EASTERN STATES OF INDIA (2001)



Dependency ratio

The dependency ratio is an agepopulation ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

Dependency ratio formula

$$\text{Dependency Ratio} = \frac{(\text{number of people aged 0 to 14}) + (\text{number of people aged 65 and over})}{\text{number of people aged 15 to 64}} \times 100$$

Migration

Human migration is the movement of people from one place in the world to another for the purpose of taking up permanent or semipermanent residence, usually across a political boundary. Migration People can either choose to move ("voluntary migration") or be forced to move ("involuntary migration"). Migration occurs at a variety of scales: intercontinental (between continents), intracontinental (between countries on a given continent), and interregional (within countries).

Migration One of the most significant migration patterns has been Rural to Urban migration—the movement of people from the countryside to cities in search of opportunities.

• FACTORS OF MIGRATION

Migration is a **global phenomenon** caused not only by economic factors but many other factors like **social, political, cultural, environmental, health, education** are included under the broader classification of **Push and Pull factors** of migration:

Push-factors	Migrants	Pull
Countries of origin		Countries
⇒ Population growth, young age structure	Demographic factors and social infrastructure	⇒ Stable pop decline, de
⇒ Inadequate educational institutions, medicare and social security		⇒ Welfare educational medicare, s
⇒ Unemployment, low wages	Economic factors	⇒ Labour den
⇒ Poverty, low consumption and living standard		⇒ Welfare, and living s
⇒ Dictatorships, shadow democracy, bad governance, political upheaval	Political factors	⇒ Democracy pluralism, p
⇒ Conflict, (civil) war, terrorism, human rights violation, oppression of minorities		⇒ Peace, secu human at protection
⇒ Ecologic disaster, desertification, lack of natural resources, water shortage, soil	Ecological factors	⇒ Better environmen protection

Push Factor: Push factors are those that **compel** a person, due to different reasons, to leave a place of **origin** (out-migration) and migrate to some other place.

Pull Factor: Pull factors indicate the factors which **attract** migrant (in-migration) to an area (destination).

Types of migration

- **internal migration:** moving within a state, country, or continent
- **external migration:** moving to a different state, country, or continent
- **emigration:** leaving one country to move to another
- **immigration:** moving into a new country
- **return migration:** moving back to where you came from
- **seasonal migration:** moving with each season or in response to labour or climate conditions

VITAL STATISTICS METHOD OF MIGRATION:

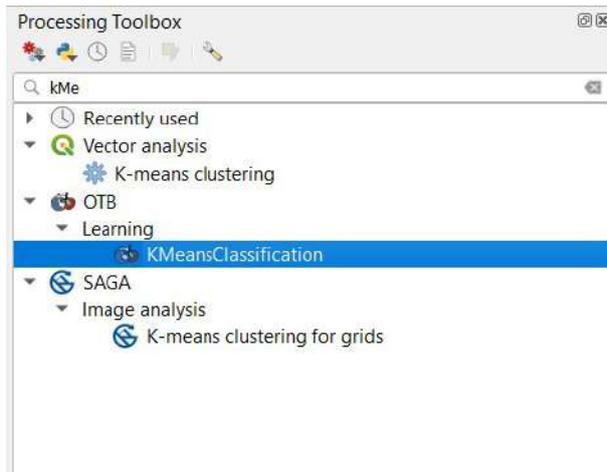
Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put in the following simple form:

$$\text{Net M} = (P_{+n}) - P_{\cdot} - (B - D)$$

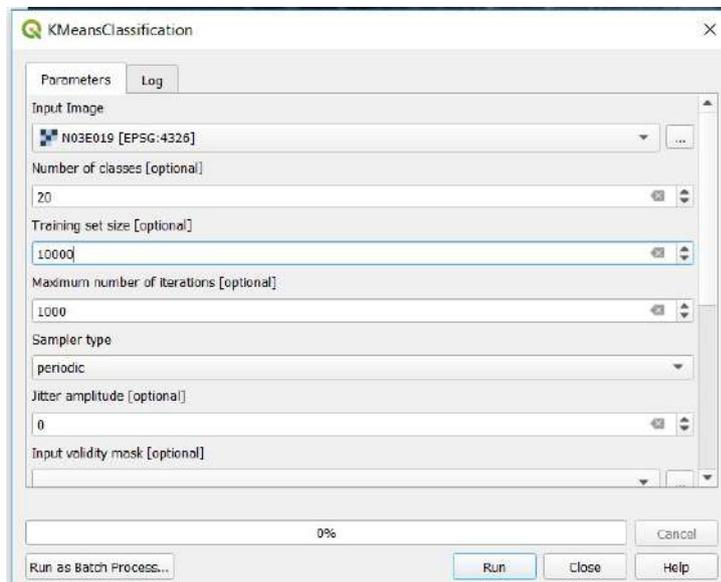
where for any given area Net M = net migration, P_· is the population at the earlier census, P_{+n} is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to residents.

Land use map using Unsupervised classification

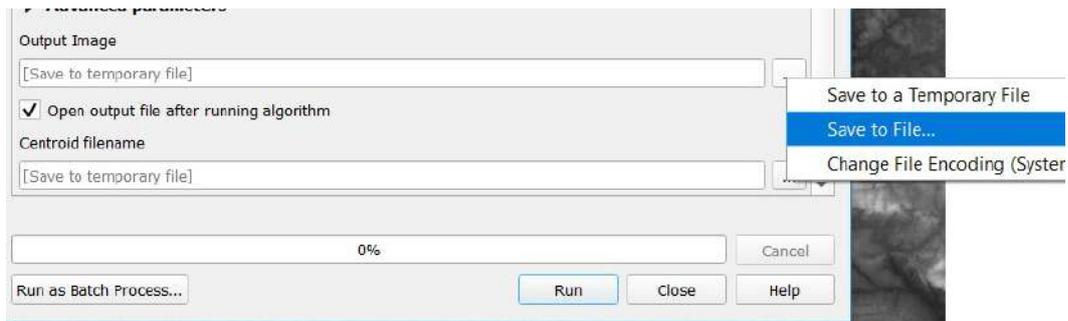
- Add a raster layer in a project **Layer >> Add Layer >> Add Raster Layer**.
- Go to the search box of Processing Toolbox , search **KMeans** and select the **KMeansClassification**.



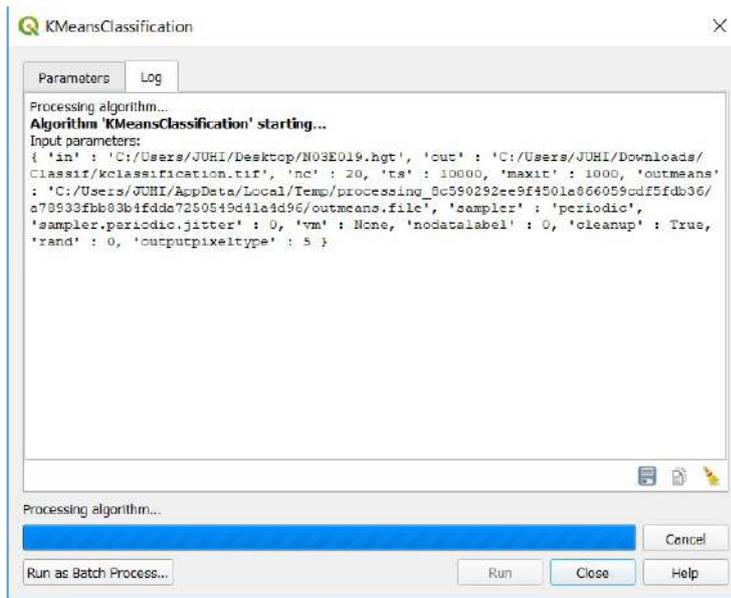
Select the input image. Type the Number of classes to 20 (default classes are 5)
Fill training size to 10000



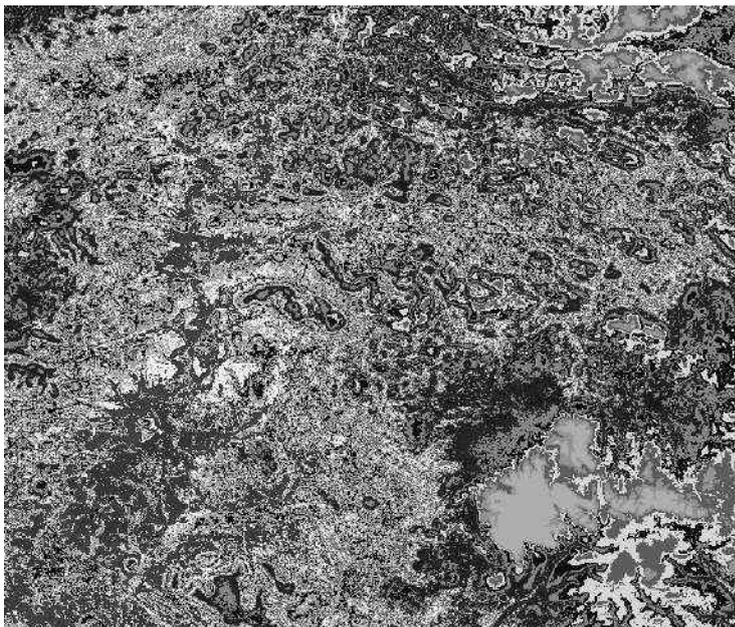
- Type the name of output image save to file.



- And in the last tap on **Run**



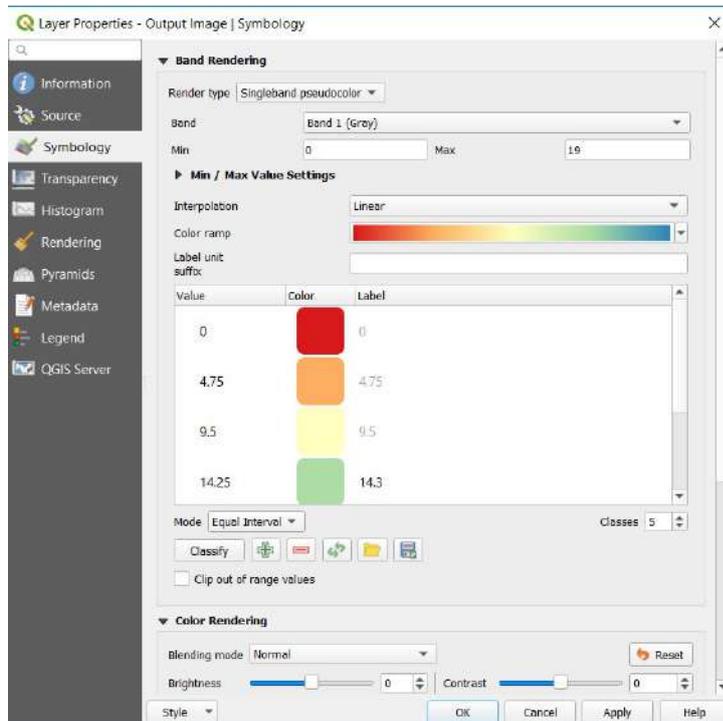
- Output image directly display on canvas. Image is shown below.



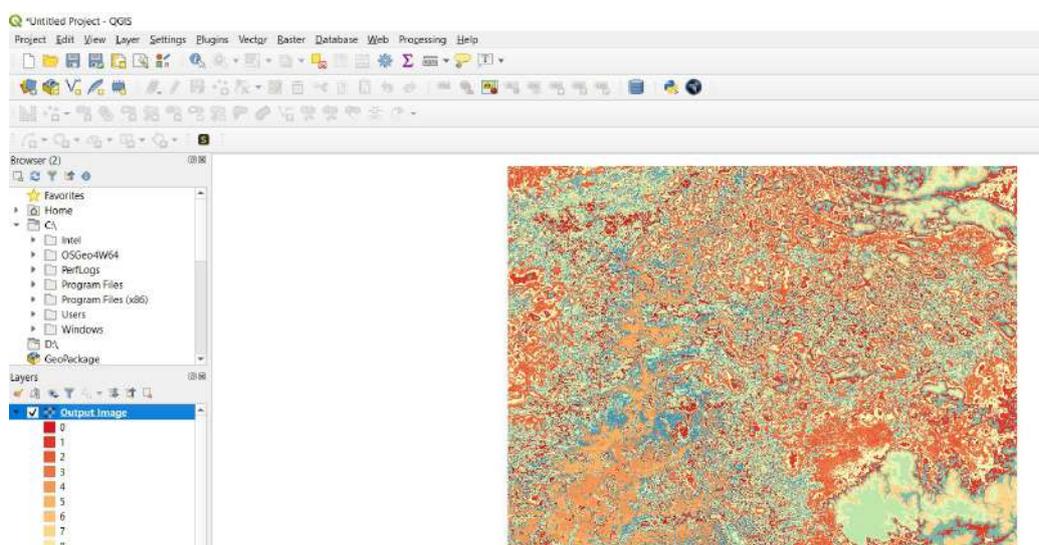
In the layer panel, right click on the output layer and select **Properties >> Symbology**. Change Render Type **SinglebandPseudocolor**.

- Select the **Color Ramp** (we selected spectral)
- Choose Mode **Equal Interval** (default selection is continous)

Change the number of **classes** from 5 to **20**.

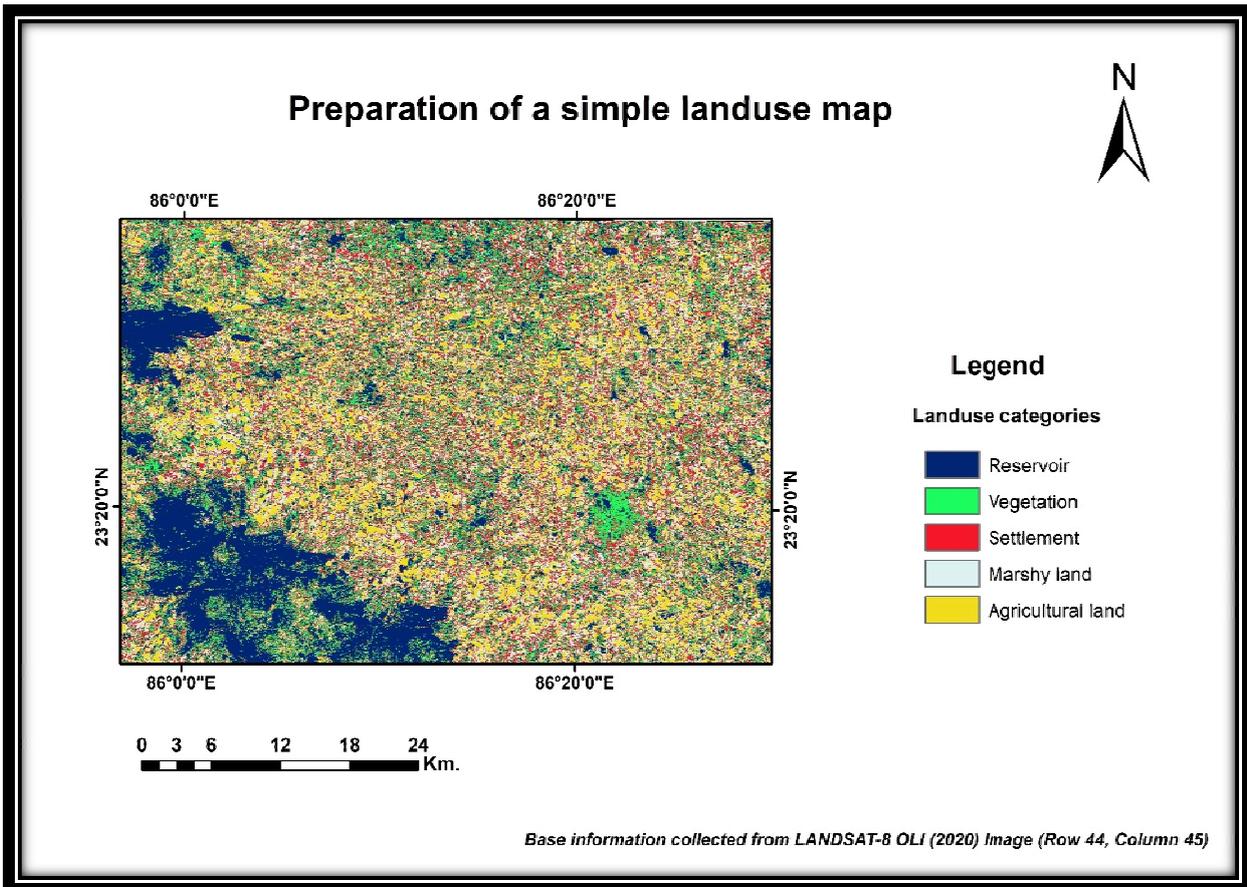


In the last click on **OK**. Output image is provided below. You can also classify according to discrete interpolation if desired



This is all about unsupervised classification using KMeansClassification. If you face any problem in implementing then please do comment.

Preparation of a simple landuse map



Interpretation:

The study area is Bankura District, is a region of West Bengal. This region have various of land use and cover features.

- **Land cover:** It is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground water etc. Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water.
- **Land use:** It not only shows how people use the landscape but also utilization of land resources naturally. Therefore, the land of a particular region can be used for the purpose of infrastructural development, settlements, amusement & recreation, conservation of wildlife and wildlife habitat, agriculture & farming or mixed uses and can be defined as 'land use'. Land use applications involve both baseline mapping and subsequent monitoring, since timely information is required to know what current quantity of land is in what type of use and to identify the land use changes from year to year.

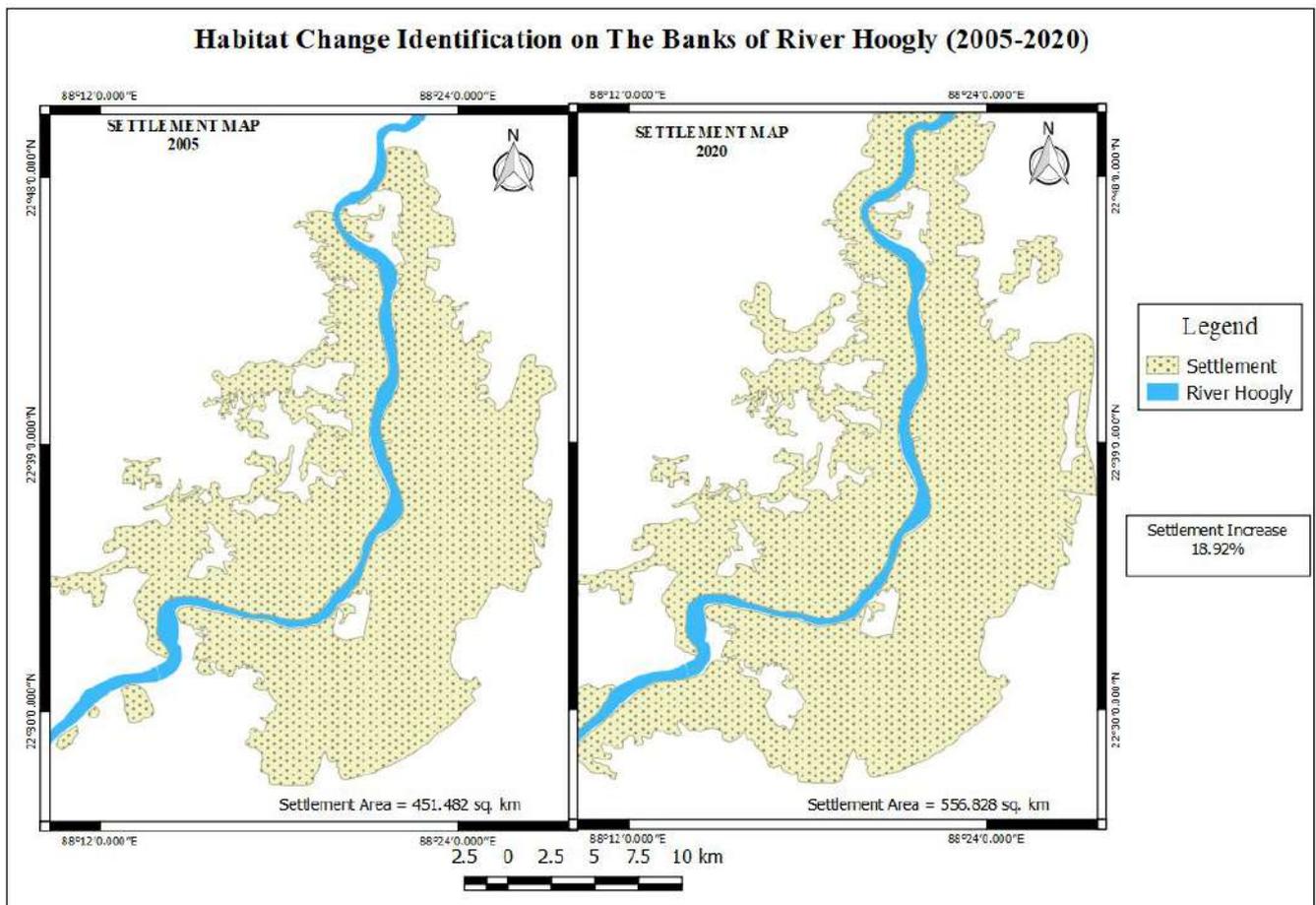
- **Vegetation:** Deciduous forest is mainly dominated by woody vegetation cover, i.e., >60% along with average plant height more than 2 metre. The floral communities dominated by the trees which hold broadleaves with an inimitable feature of annual cycle of leaf-on and leaf-off periods means the trees shed their leaves at a particular season of each year, mainly in late winter. Dense forest like Khatra, Ranibandh, Bishnupur, Sonamukhi, Bojora, Gangajal ghati occupies huge areas of the district, Bankura. Currently the land under forest department is approximately 21.5%. About 48% of the forest in this district is degraded type and alarmingly the forest/plant cover is depleting gradually. In addition to ecological utilities, the forests in this district also serve as the basis of livelihood of poor communities of the rural area and the tribes as well. Forests not only provide money but also are important for energy resources in form of fuel and forage for the disadvantaged folks. This type of forest mainly located West, East and South part of the district.

- **Cropland:** Temporarily cropped area followed by harvest and a bare soil period (e.g., single and multiple cropping systems). Different types of crop cultivation and cropping arrangement are specified according to the seasons (e.g., kharif, rabi, zaid). Cropland includes areas are used for the common crop production and are also used for the adapted crops for harvest. Agriculture in Bankura district is dominated by paddy cultivation in kharif season and mustard cultivation in rabi season. A large number of landraces of rice were cultivated by the tribal and rural community of farmers of Bankura district, so far 65 folk rice varieties are produced from Bankura District of West Bengal viz., Dharnagra, Suakalma, Vutmuri, Tulsibhog, Sitasal, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, Badsahabhog, Raghusal, Bhurisal, Khajurchari, Gangajali, Basmati and Kataribhog. Other crops are paddy, wheat, sugarcane, oilseeds etc.,

- **Water Body:** Bankura is drained by three major rivers e.g., Damodar, Darkeswar and Kangsabati along with their tributaries as Gandheswari, Silai and Kumari deserves special consideration. The rivers of the area are flowing from the north-east to the south-west in courses roughly parallel to one another. They are mostly rain-fed, hill streams, originating from hills in the west. The rivers come down in floods after heavy rains and subside as rapidly as they rise. In summer, their sand beds are almost always dry. Damodar river forms the northern boundary of the district along with Bardhaman district for about 72 kilometres and then flows into Bardhaman district. Saliriver which is one of the important tributaries of the Damodar, drains the northern part of the district.

- **Settlement:** Settlement is one of the major land use features. In the study area here almost every place has settlement. Mainly centre to east part of the district are dense population.
- **Upland:** Here I also noticed that the south, middle and west part of the district have some of uplands. Maximum river are generated from this area.

Human Habitation and Detection of Change from Two Satellite Image of (2005- 2020)



Interpretation:

Here we can see some changes of settlement on both sides of river Hooghly. According to our calculation settlement increases around 19% from 2005 to 2020. Mainly south part of map settlement increase massively. Where in 2005 the settlement area was only 451.48 sq.km. on 10km buffer of the river it increases in 2020 in 556.83 sq.km.. West part of the river is maximum settlement increase then the left part.

Spatial Plan Formulation and Layout Map of a Gram Panchayat

Step 1-Collect Mouza map from following Gram Panchyat.

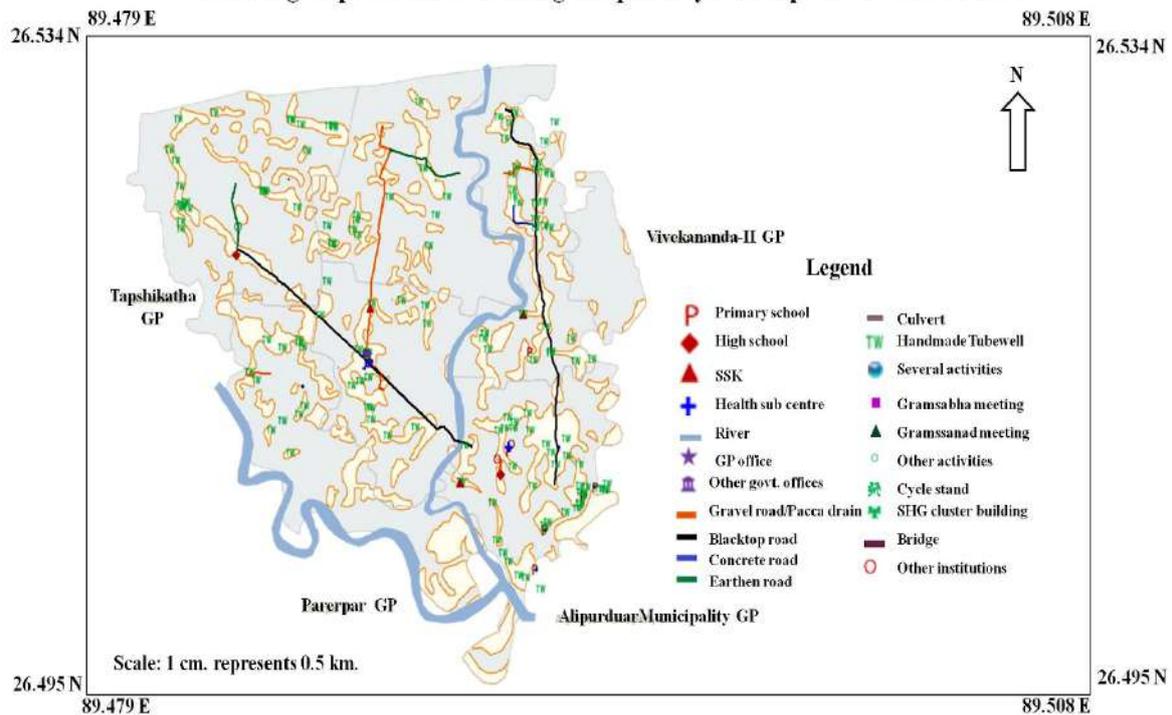
Step 2. Then using QGIS Georeference the the Mouza Map and clip the particular the village Boundary.

Step 3. Using GPS survey I collect every impotent place of the village like school, police station, any administrative building etc. it find from gram panchyat by secondary data.

Step4. Plot the places as a point and digitized settlements also Roads using Qgis.

Step 5. At the end prepare a layout map and add legends, north lines, scale and heading of the map.

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation:

Banchukamari is a Village in Alipurduar-i Block in Jalpaiguri District of West Bengal State, India. It belongs to Jalpaiguri Division . It is located 89 KM towards East from District head quarters Jalpaiguri. 4 KM from Alipurduar-I. 530 KM from State capital Kolkata. In this village planning map I put every impotent features. Here we see in village have 2 river one is run west boundary of the village and another is running centre part of the village. I noticed right sight of Centre River have maximum primary school then other side of the river. Also noticed here 2 high school one is west part of village and another is south east part of the village. Handmade tube well is available everywhere in the village. But here only 2 hospital or health centre located in the village. Centre of the village have Gram panchyat and govt. Offices. Here also noticed 2 SSK and one other institution.

SNEHA BANERJEE

ROLL - BGC-MGF-SIV-21 NO-325

REGISTRATION NO- 1071921401418

SEMESTER 4

REGIONAL PLANNING AND RURAL DEVELOPMENT
PRACTICAL

RURAL RESEARCH METHOD AND METHODOLOGY

- ❖ **Definition of Research:** Research is a process of systematic inquiry that entails collection of data; documentation of critical information; and analysis and interpretation of that data/information, in accordance with suitable methodologies set by specific professional fields and academic disciplines.

Research is conducted to evaluate the validity of a hypothesis or an interpretive framework; to assemble a body of substantive knowledge and findings for sharing them in appropriate manners; and to generate questions for further inquiries.

- ❖ **Types of research:**

Research methods are broadly classified as **Qualitative** and **Quantitative**.

Both methods have distinctive properties and data collection methods.

- ➔ **Qualitative methods**

Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

- Types of qualitative methods include

- One-to-one Interview
- Focus Groups
- Ethnographic studies
- Text Analysis
- Case Study

- ➔ **Quantitative methods**

Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

- Types of quantitative methods include:

- Survey research
- Descriptive research

- Correlational research

❖ **FIELD RESEARCH:**

Field research is defined as a qualitative method of data collection that aims to observe, interact and understand people while they are in a natural environment.

❖ **Characteristics of Good Research:**

- Good research follows a systematic approach to capture accurate data.
- Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
- Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
- It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

➞ **Selection Of Research Problem**

The selection of topic for research is a difficult job. When we select a title or research statement, then other activities would be easy to perform. So, for the understanding thoroughly the problem it must have to discuss with colleagues, friend, experts and teachers. The research topic or problem should be practical, relatively important, feasible, ethically and politically acceptable.

➞ **Literature Search On Research Problem:**

Literature search is a systematic and well-organised search from the already published data to identify a breadth of good quality references on a specific topic. The reasons for conducting literature search are numerous that include drawing information for making evidence-based guidelines, a step in the research method and as part of academic assessment. However, the main purpose of a thorough literature search is to formulate a research question by evaluating the available literature with an eye on gaps still amenable to further research.

Literature search is done to identify appropriate methodology, design of the study; population sampled and sampling methods, methods of measuring concepts and techniques of analysis. It also helps in determining extraneous variables affecting the outcome and identifying faults or lacunae that could be avoided.

➞ **Framing Research Question And Hypothesis:**

After generating an interest in a particular research area, that interests the researcher maximum to work with passion, one needs to define the research question. Very often, these research questions will stem from a good review of literature, which is recommended to be done before initialising a research project. The review is done

typically to find out the existing knowledge on the subject and also to find out the research gaps that are potential research areas. The research papers reviewed will also give an insight about the methodological issues necessary for executing out research ideas. It is apt to find out a good systematic review or a Cochrane review [5] on your issue that must have synthesised evidence and accumulated all research studies and yielded results that should serve as a guide for future work. It is also pertinent that one should discuss the research idea with peers, teachers, mentors, who can comment upon relevance of the research idea and help in refining it further.

➤ **Types of research questions :**

There are three types of research questions, each of which reflect the type of research study. These types are as follows:

i. Descriptive questions: these questions generally look at descriptions of a particular issue or situation. Descriptive questions usually have just one variable, but in cases where there are multiple variables, the direction of the relationship is not specified in descriptive studies. An example of a descriptive question is “What percentage of low income children complete primary school in communities of Mumbai?”

ii. Exploratory questions: these questions explore a particular issue or phenomenon and usually involve two or more variables. Example: “Is there a relationship between maternal education and children’s school completion in rural Bihar?”

iii. Explanatory questions: these questions seek to establish causal effects between two or more variables. Example: “Do parents who have completed their bachelor’s degree have the same aspira

➤ **What is a Hypothesis?**

A hypothesis (plural form: hypotheses) is a statement that explains the relationship between two or more variables. This statement is tested during a research study, and the predicted relationship can be proved to be either valid or invalid within the framework or particular context of the study. It is important to note that a hypothesis is validated (or proved to be invalid) within the specified time frame of the study.

In quantitative studies, a hypothesis is usually stated in advance of the study, and then is tested during the study. Stating a hypothesis in advance helps researchers to keep the study focused and also helps them interpret the results of a study against an established framework. A hypothesis is formulated based on existing knowledge, and by the process of being tested during a research study, serves as a tool to advance knowledge on a particular subject. Even if a given hypothesis is proved to be false during a study, the result is regarded as an advancement of knowledge because we know that within the context of the study, the stated variables do/do not share a relationship. This knowledge is useful to other researchers who may want to test that relationship in other contexts

➤ **Types of hypotheses:**

There are primarily two types of hypotheses – a) Null hypothesis and b) Alternative hypothesis.

a) Null Hypothesis: Also known as the Statistical Hypothesis, the Null Hypothesis is often noted as H_0 (H zero) or H_N (H null). This type of hypothesis expresses a variable relationship that has either been proved true or has not yet been tested but is being used as the basis for an argument. A Null Hypothesis usually states there is no relationship between two or more variables, as stated in the research hypothesis. The conclusion of a quantitative study is usually expressed in terms of the Null hypothesis. A study can either conclude that “the Null Hypothesis was rejected in favor of the Alternative Hypothesis” or “the Null Hypothesis was not rejected.”

b) Alternative Hypothesis: Also known as the Research or Scientific Hypothesis, the Alternative Hypothesis is noted as H_1 (H one) or H_A (H alternative). This type of hypothesis is a statement for what the test seeks to establish. This type of hypothesis is considered the opposite of the Null hypothesis and is usually arrived at when the Null hypothesis is rejected.

❖ **Selecting Study Area And Target Population:**

Research projects can focus on a specific group of people, facilities, park development, employee evaluations, programs, financial status, marketing efforts, or the integration of technology into the operations. For example, if a researcher wants to examine a specific group of people in the community, the study could examine a specific age group, males or females, people living in a specific geographic area, or a specific ethnic group. Literally thousands of options are available to the researcher to specifically identify the group to study. The research problem and the purpose of the study assist the researcher in identifying the group to involve in the study. In research terms, the group to involve in the study is always called the population. Defining the population assists the researcher in several ways. First, it narrows the scope of the study from a very large population to one that is manageable. Second, the population identifies the group that the researcher's efforts will be focused on within the study. This helps ensure that the researcher stays on the right path during the study.

❖ **Develop the Instrumentation Plan:**

The plan for the study is referred to as the instrumentation plan. The instrumentation plan serves as the road map for the entire study, specifying who will participate in the study; how, when, and where data will be collected; and the content of the program.

❖ **Identifying And Collecting Relevant Secondary Data:**

Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

A data classified as secondary for a particular research may be said to be primary for another research. This is the case when a data is being reused, making it a primary data for the first research and secondary data for the second research it is being used for.

- **Sources of Secondary Data**

Sources of secondary data include books, personal sources, journal, newspaper, website, government record etc. Secondary data are known to be readily available compared to that of primary data. It requires very little research and need for manpower to use these source

- ❖ **Preparing Survey Schedule And Questionnaire:**

Surveys are used as a method of gathering data in many different fields. They are a good choice when you want to find out about the characteristics, preferences, opinions, or beliefs of a group of people

There are two main types of survey:

A questionnaire, where a list of questions is distributed by mail, online or in person, and respondents fills it out themselves.

An interview, where the researcher asks a set of questions by phone or in person and records the responses.

- Design the survey questions
- Next, you need to decide which questions you will ask and how you will ask them. It's important to consider:
 - The type of questions
 - The content of the questions
 - The phrasing of the questions
 - The ordering and layout of the survey

- ➡ **Open-ended vs closed-ended questions:**

There are two main forms of survey questions: open-ended and closed-ended. Many surveys use a combination of both.

Closed-ended questions give the respondent a predetermined set of answers to choose from

Closed-ended questions are best for quantitative research. They provide you with numerical data that can be statistically analyzed to find patterns, trends, and correlations.

Open-ended questions are best for qualitative research. This type of question has no predetermined answers to choose from. Instead, the respondent answers in their own words.

USE OF FOCUS GROUP DISCUSSION IN RESEARCH STUDY

What Is a Focus Group Discussion?

A focus group discussion (or FGD) is a qualitative research method in the social sciences, with a particular emphasis and application in the developmental program evaluation sphere.

FGDs are a predetermined semi-structured interview led by a skilled moderator. The moderator asks broad questions to elicit responses and generate discussion among the participants. The moderator's goal is to generate the maximum amount of discussion and opinions within a given time period.

When Should You Use a Focus Group Discussion?

Focus group discussions should be used when you need to understand an issue at a deeper level than you can access with a survey. They are helpful for adding meaning and understanding to existing knowledge, or getting at the "why" and "how" of a topic.

Key Features of FGDs :

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill areFree and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights. required to moderate a group successfully.

Creating the Questionnaire

It is important to take time to carefully plan your questions. Poorly-worded, biased, or awkward questions can derail a FGD and spoil the quality of your data.

- Keep the number of questions reasonable (under 10, if possible). This prevents the participants from getting confused or worn out by a long discussion.

- Keep the questions simple and short. FGD participants won't get the chance to see the questions like in a survey.
- Ensure that the wording on questions is clear. Otherwise, participants will end up discussing the question itself, rather than what the question was trying to ask.
- Be careful that questions about sensitive issues or topics are asked carefully. Otherwise, the FGD will stop just because people are too embarrassed to answer.

Question Types

There should be three types of questions in a focus group discussion:

1. **Probe questions:** these introduce participants to the discussion topic and make them feel more comfortable sharing their opinion with the group
2. **Follow-up questions:** delve further into the discussion topic and the participants' opinions
3. **Exit question:** check to ensure that you didn't miss anything

Length of the Focus Group Discussion

An FGD should be between 60 and 90 minutes.

If the FGD is shorter than 60 minutes, it is often difficult to fully explore the discussion topic. If the FGD is longer than 90 minutes, the discussion can become unproductive (as participants get weary) and the discussion can start to impose on participants' time.

Selecting the Participants

Focus group discussions involve two to eight people on average. Greater than eight participants becomes crowd for a FGD and is more suited for an advisory board.

- **Gender:** Will men and women feel comfortable discussing this topic in a mixed-gender group? For example, women might feel uncomfortable discussing maternal health if men are in the group.
- **Age:** Will age affect the way that people react to this topic? For example, a young person might feel uncomfortable talking about his drinking habits if older people from his community are in the room.
- **Hierarchy:** Will people of different hierarchical positions be able to discuss this topic equally? For example, a student might feel uncomfortable discussing her teachers if the school principal is in the FGD.

Steps to conduct focus group research

1. Recruit the right participants

A researcher must be careful while recruiting participants. Members need adequate knowledge of the topic so that they can add to the conversation.

2. Choose a moderator

Your moderator should understand the topic of discussion and possess the following qualities:

- Ensures participation from all members of the group.
 - Regulates dominant group members so others may speak.
 - Motivates inattentive members through supportive words and positive body language.
 - Makes the executive decision to end or continue a discussion should it become too heated.
- Verify your moderator doesn't know any of the participants. Existing relationships between a member and moderator cause bias and can skew your data.

3. Record the meeting for future purposes

While conducting a focus group, it is essential to record the sessions or meetings. A researcher can record the discussion through audio or video. You must let participants know you're planning to record the event and get their consent.

4. Write clear discussion guidelines

Before the session starts, it is crucial to write down clear session guidelines. Include key questions, expectations of focus group members, whether you're recording the discussion, and methods of sharing results. Give out the instructions in advance and request participants to comply with them.

5. Conduct the session and generate a report

Once participants understand their role, the moderator leads the focus group survey. You can ask members to fill out a feedback form to collect **quantitative data** from the event. Use your data and generate reports on the overall findings of your study.

6. Use the data to make a plan of action

Share your report with stakeholders and decisionmakers in your organization. A good report helps you design actionable plans to improve products or services according to the focus group feedback. Update focus group members on the changes you make and the results of those changes.

Pros and Cons of Using FGDs :

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

SWOT ANALYSIS OF RURAL DEVELOPMENT SCHEME

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a situation and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription

The Elements Of A SWOT Analysis:

The SWOT analysis stands for the analysis of internal strengths and weaknesses of an operation and external opportunities and threats to the operation. Below is a description of each of these elements that should be considered when performing a SWOT analysis.

Strengths: The first element of a SWOT analysis describes the strengths of an operation. These strengths include what an operation does well, and should be viewed from both your point of view as well as the point of view of people with whom you come in contact. In some cases, an organization's strengths are obvious, for example, being a low cost producer. In other cases, it is a matter of perspective, for instance our product is of high quality. It is important to note that operations that are in a bad position also have strengths. Whether or not these strengths are adequate should be determined through further analysis.

Weaknesses: The other internal element of the SWOT analysis describes the weaknesses of an operation. Examining weaknesses include identifying what an operation does not do well. As with the strengths, weaknesses should be examined from both your perspective and from the perspective of those outside your operation. It is also possible for weaknesses to be obvious such as a limitation of resources or be more of a perspective issue such as a lack of teamwork. All operations, regardless of size or profitability have weaknesses. How badly these weaknesses will affect the operation should be left to further analysis.

Opportunities: The first external element of the SWOT analysis is opportunities. The opportunities include any favorable situation in the business's environment that the operation may realize gains from. These could range from diversification and the use of new technologies to market trends and relationship developments. It is important to note that all operations have some opportunities: identifying these opportunities is the sign of a good analyst.

Threats : The final element of the SWOT analysis is the external threats that the operation faces. Regardless of size or profitability, all operations face threats. These threats could range from lower international prices to key relationships that are not going well. Whatever the threat, the operation should have a plan in place to resolve the problem.

Techniques And Formulation Of Rural Planning Through Data Analysis

POPULATION COMPOSITION:

Population composition is the description of population defined by characteristics such as age, race, sex or marital status. These descriptions can be necessary for understanding the social dynamics from historical and comparative research. This data is often compared using a population pyramid.

Population composition is also a very important part of historical research. Information ranging back hundreds of years is not always worthwhile, because the numbers of people for which data are available may not provide the information that is important (such as population size). Lack of information on the original data-collection procedures may prevent accurate evaluation of data quality.

SEX COMPOSITION

The number of women and men in a country is an important demographic characteristic. The ratio between the number of women and men in the population is called the Sex Ratio

AGE STRUCTURE

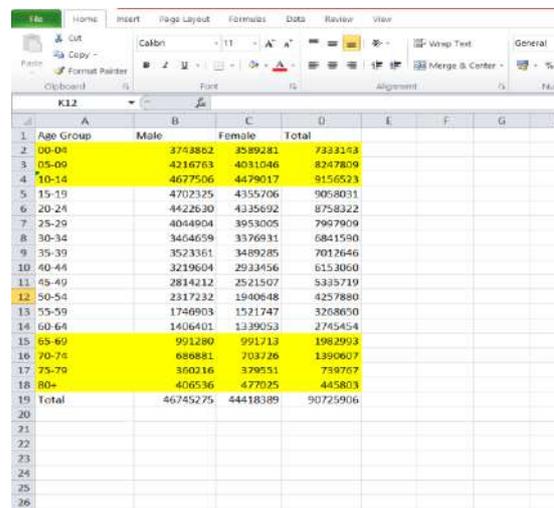
Age structure represents the number of people of different age groups. This is an important indicator of population composition, since a large size of population in the age group of 15- 59 indicates a large working population. A greater proportion of population above 60 years represents an ageing population which requires more expenditure on health care facilities.

AGE-SEX PYRAMID

The age-sex structure of a population refers to the number of females and males in different age groups. A population pyramid is used to show the age-sex structure of the population. The shape of the population pyramid reflects the characteristics of the population. The left side shows the percentage of males while the right side shows the percentage of women in each age group.

STEPS TO CREATE AGE SEX PYRAMID:

1. Open M.S Excel > put the data > age group > male > female > total

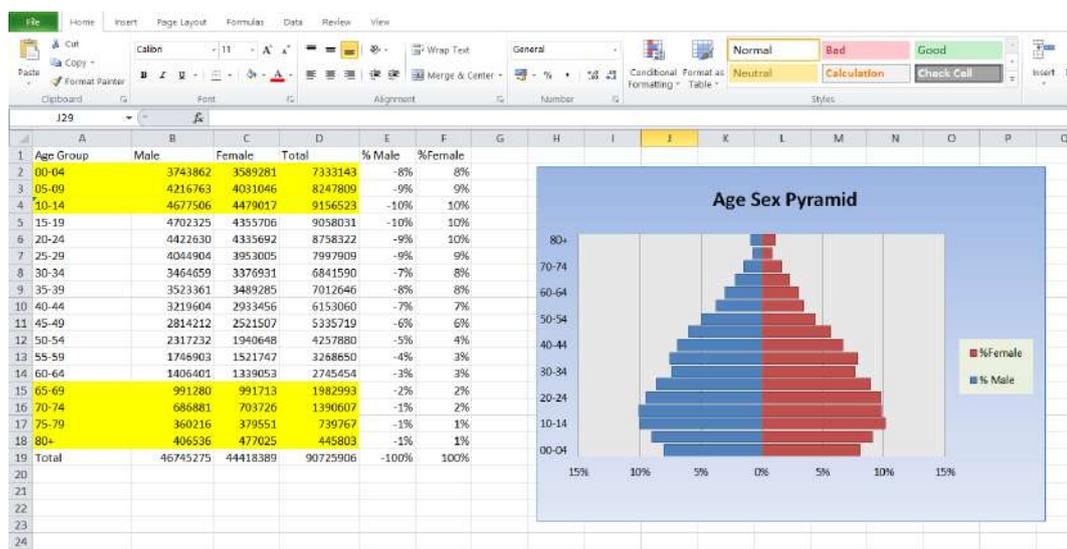


Age Group	Male	Female	Total
00-04	3758802	3589281	7333183
05-09	4216763	4031046	8247809
10-14	4677506	4479017	9156523
15-19	4702325	4355706	9058031
20-24	4422630	4335692	8758322
25-29	4054804	3953005	7997909
30-34	3454659	3376931	6831590
35-39	3523361	3489285	7012646
40-44	3219604	2933456	6153060
45-49	2814212	2521507	5335719
50-54	2317232	1940648	4257880
55-59	1746903	1521747	3268650
60-64	1406401	1339053	2745454
65-69	991280	991713	1982993
70-74	688881	703726	1390607
75-79	360216	379551	739767
80+	406536	477025	445803
Total	46745275	44418389	90725906

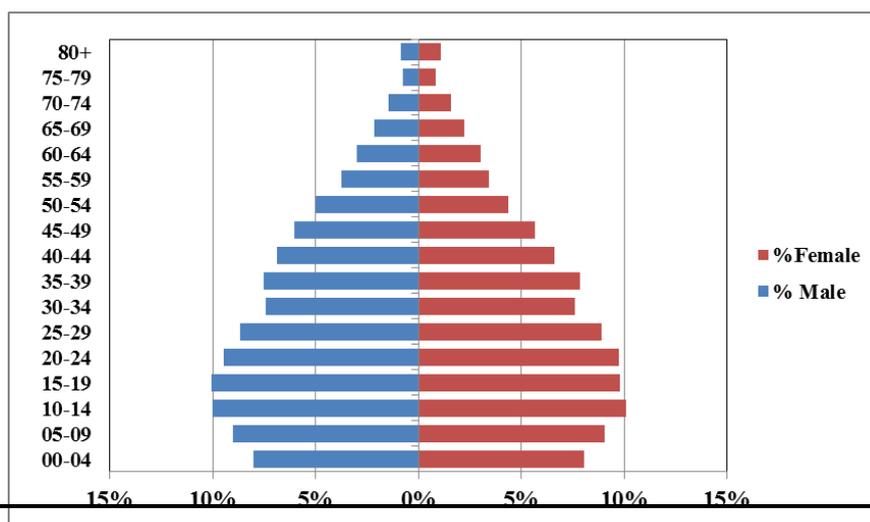
- Calculate the % of the data of male and female population > put the formula for % > for male= 0-(cell no/ cell no.\$)> for female=0+(cell no/ cell no.\$)> sum all the %

	A	B	C	D	E	F	G	H
1	Age Group	Male	Female	Total	% Male	%Female		
2	00-04	3743862	3589281	7333143	-8%	8%		
3	05-09	4216763	4031046	8247809	-9%	9%		
4	10-14	4677506	4479017	9156523	-10%	10%		
5	15-19	4702325	4355706	9058031	-10%	10%		
6	20-24	4422630	4335692	8758322	-9%	10%		
7	25-29	4044904	3953005	7997909	-9%	9%		
8	30-34	3464659	3376931	6841590	-7%	8%		
9	35-39	3523361	3489285	7012646	-8%	8%		
10	40-44	3219604	2933456	6153060	-7%	7%		
11	45-49	2814212	2521507	5335719	-6%	6%		
12	50-54	2317232	1940648	4257880	-5%	4%		
13	55-59	1746903	1521747	3268650	-4%	3%		
14	60-64	1406401	1339053	2745454	-3%	3%		
15	65-69	991280	991713	1982993	-2%	2%		
16	70-74	686881	703726	1390607	-1%	2%		
17	75-79	360216	379551	739767	-1%	1%		
18	80+	406536	477025	445803	-1%	1%		
19	Total	46745275	44418389	90725906	-100%	100%		

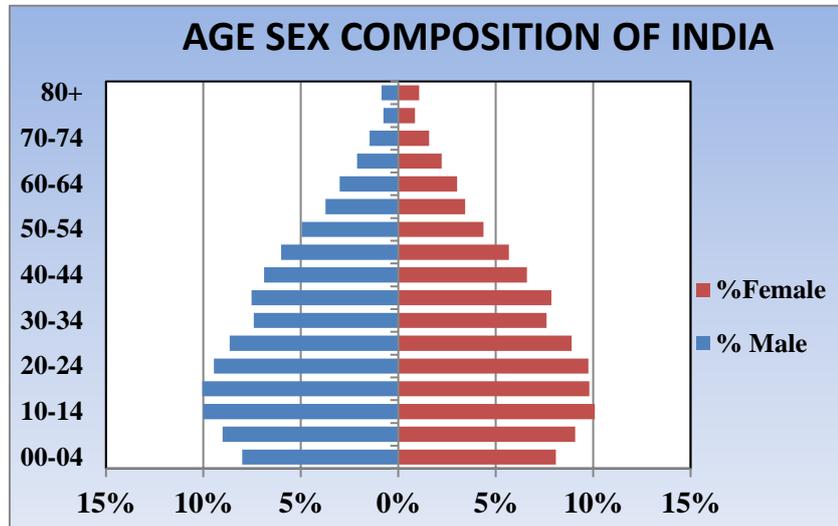
- After calculating the % select the data and travel insert and select a suitable bar.



- Select the chart title > click in age group> format axis > labels > label position low > after this to remove- from horizontal axis right click on it > format axis > open tool box> travel number > click on custom > add the formatting code. > after converging thid into + the select legeng by using format legend.



5. After converting select the legend by using format legend.



I

It can be categorised in terms of age groups (e.g., 0-14 years, 15-64 years, and 65 years or above). The changing structure of the population in each of these broader age groups, reveals many possibilities to understand the age composition of the population as well as the sex distribution across these ages. As per Census 2011, India has a moderately significant proportion of the people in the younger age groups in the world. Around 31 % of the population of the country belongs to the age group of 0-14 years according to Census 2011. At the same time, the adult population between the age group of 15-59 years constitute 60.5% of the population.

➤ OCCUPATIONAL STRUCTURE:

The occupational structure of a nation refers to the percentage of its workforce employed in various economic ventures. To put it in other words, articulating the number of the total working population employed in agriculture and associated activities and the number of them involved in the manufacturing and service sectors can be identified from the occupational structure of the nation.

The occupational structure of an economy plays a vital role in the overall economic scenario of the economy. The number of workers employed in different sectors of the economy is crucial to determine the level of development of the economy.

Features of an Occupational Structure

The salient features of India's occupational structure are as follows:

- Agriculture is a primary source of occupation in the nation.
- At the time of Independence, almost 75% of the total population was engaged in agricultural activities, as a result of which there still lies backwardness in the Indian economy.
- All three sectors of the nation witnessed unbalanced advancement and escalation.
- The growth in regional variations.
- The states like Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, West Bengal, and Kerala observed a significant shift in their dependence of the working population from the agricultural sector to the manufacturing as well as tertiary sectors.
- But states like Punjab, Rajasthan and Odisha increased their share of the workforce in the agricultural sector.

❖ Occupational Structure of North Eastern States On India:

The north east India where live 45,486,784 people has a big work force of 16,670,984 people according to 2011 census. Among the three different sectors of the economy of the region most of the people are engaged in the primary sector and comparatively a small number of the working population are associated with the secondary and tertiary sector.

• Work Participation rate among the people of North East :

Work participation rate denotes the percentage of total workers i.e., total main and marginal workers to the total population in an area.

STATES	PERSONS	MALE	FEMALE
Arunachal PRADESH	42.5	49.1	35.4
Assam	38.4	53.6	22.5
Manipur	45.1	51.6	38.6
Meghalaya	40	47.2	32.7
Mizoram	44.4	52.4	36.2
Nagaland	49.2	53.4	44.7
Sikkim	50.5	60.2	39.6
Tripura	40	55.8	23

Figure : Pie Diagram Showing Work Participation Rate Of North Eastern India



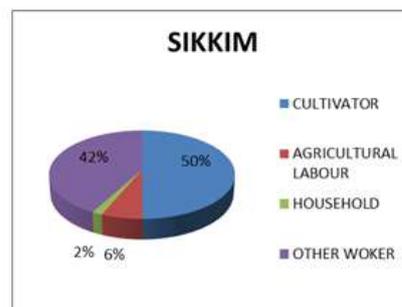
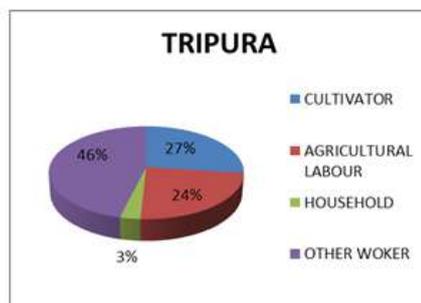
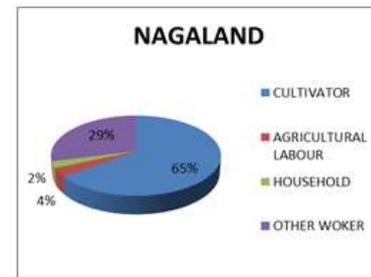
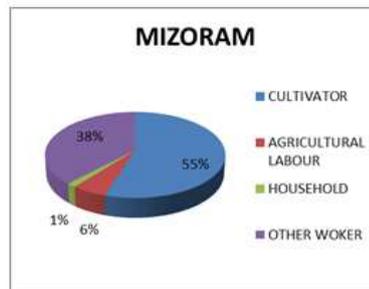
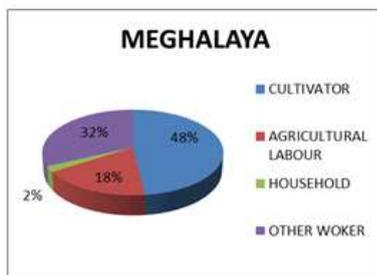
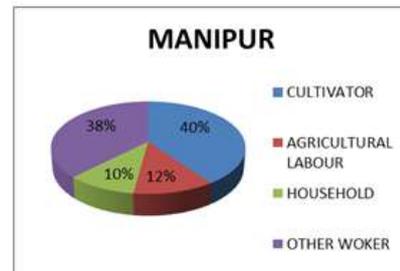
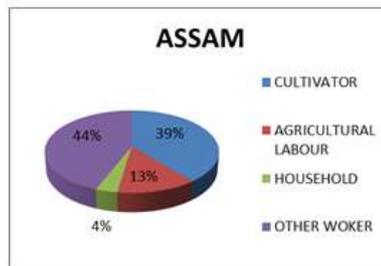
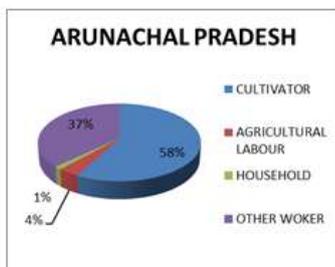
Among the 8 North eastern states Sikkim has highest work participation rate while Assam has the lowest .Females of Sikkim have highest work participation and Assam has the lowest female work participation rate

➤ **Occupational structure of North Eastern states of India:**

The economy of India's North East Region consists of 8 states is being holding an important place in Indian economy. However the region is still industrially backward despite of huge potentials and is mostly predominated by agricultural activities. The occupational distribution of the population in the region is also the same as its economic scenario. In this seminar paper we have described and analyzed the pattern of occupational distribution of the population of the north east region of India with some objectives mentioned below.

Distribution of worker in four different economic activities cultivation, agricultural laborers, household industries and other sectors are given in the following table:

STATES	CULTIVATOR	AGRICULTURAL LABOUR	HOUSEHOLD	OTHER WORKER
Arunachal Pradesh	57.8	3.9	1.3	37
Assam	39.1	13.2	3.6	44
Manipur	40.2	12	10.3	37.6
Meghalaya	48.1	17.7	2.2	32
Mizoram	54.9	5.7	1.5	37.9
Nagaland	64.7	3.6	2.6	29
Tripura	27	23.8	3	46.1
Sikkim	49.9	6.5	1.6	42



Among 8 North Eastern India Nagaland has the highest cultivator rate and Tripura has the lowest, Meghalaya has the highest agricultural labour, Manipur has the highest household industrial worker and Assam has the highest rate of the other sector workers.

Dependency Ratio

The dependency ratio is a measure of the number of [dependents](#) aged zero to 14 and over the age of 65, compared with the total population aged 15 to 64. This demographic indicator gives insight into the number of people of non-working age, compared with the number of those of working age. It is also used to understand the relative economic burden of the workforce and has ramifications for taxation. The dependency ratio is also referred to as the total or youth dependency ratio.

The formula of dependency ratio is: (Number of Dependents or Non-Working Age Group)/ (Population aged between 15 to 64 Years) * 100

MEASUREMENT OF MIGRATION:

[Migration](#) is a way to move from one place to another in order to live and work. Movement of people from their home to another city, state or country for a job, shelter or some other reasons is called migration. Migration from [rural areas](#) to [urban areas](#) has increased in past few years in India.

➤ **Causes**

The causes vary, from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area. The roots of [migration] are the following:

➤ **Economic**

Seek employment, start or continue a career, in particular, take advantage of the economic benefits of a specific country, and so on.

➤ **Social**

stay close or live with the family, seek a better quality of lifestyle, and so on.

➤ **Policies**

flee from persecutions, wars, and other types of problems or political conflicts that put lives at risk.

➤ **Cultural**

Improve the quality of [education](#), seek religious affinity or tolerance, taste for the culture of the country, and so on.

➤ **Environmental**

Escape from natural disasters, find a place with a more pleasant climate, and so on.

➤ Types

There are several types of [migration] according to various criteria, but the most referred to are the following.

– Internal migration

It includes the movements within the same region, state, or country.

– External Migration

It constitutes migratory movements in which people settle in another region, state, or country different from the previous one.

➤ International migration

It happens when people move from one country to another.

➤ Seasonal migration

It is a type in which people migrate, but for a certain period, so it is a semi-permanent migration. Typically, seasonal migrants are attracted to job opportunities or better weather conditions.

➤ Effects

Often, migratory movements reflect the social, political, and economic conditions of the world, and have impacts on the soil and landscape of places from where and where people move. A high immigration rate in cities can cause overpopulation, and affect the availability of public services and increase pollution.

In demographic terms, migration increases or reduces the size of a population, and influences its structure and determines the size and rates of its growth. It also has a vital role in the distribution of the people, since in some countries migrants from a region or country tend to concentrate in specific areas of the country to which they migrate

➤ Measurement of migration:

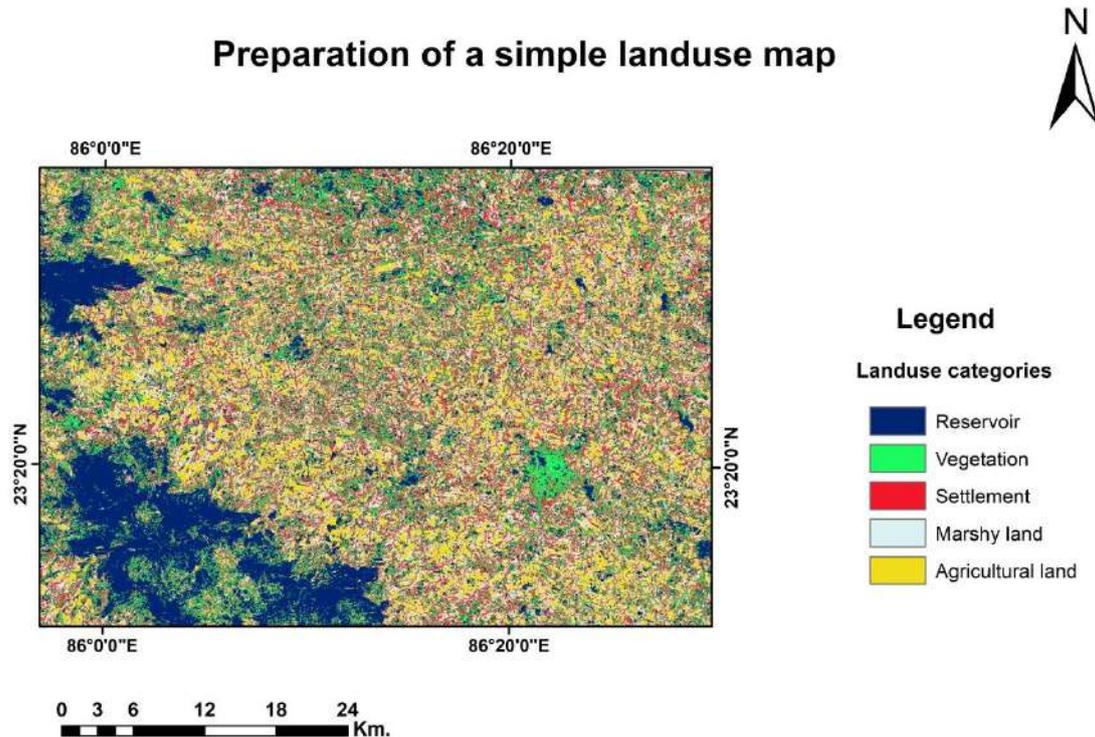
Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. **This "balancing equation" can be put in the following simple form:**

$$\text{Net M} = (P_{+n}) - P - (B - D)$$

where for any given area Net M = net migration, P. is the population at the earlier census, P.+n is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to reside.

PREPERATION OF LAND USE MAP USING OPEN SOFTWARE

Preparation of a simple landuse map



Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

The study area is Bankura District, is a region of West Bengal. This region have various of land use and cover features.

- **Land cover:** It is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground water etc. Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water.
- **Land use:** It not only shows how people use the landscape but also utilization of land resources naturally. Therefore, the land of a particular region can be used for the purpose of infrastructural development, settlements, amusement & recreation, conservation of wildlife and wildlife habitat, agriculture & farming or mixed uses and can be defined as 'land use'. Land use applications involve both baseline mapping and subsequent monitoring, since timely information is required to know what current quantity of land is in what type of use and to identify the land use changes from year to year.
 - **Vegetation:** Deciduous forest is mainly dominated by woody vegetation cover, i.e., >60% along with average plant height more than 2 metre. The

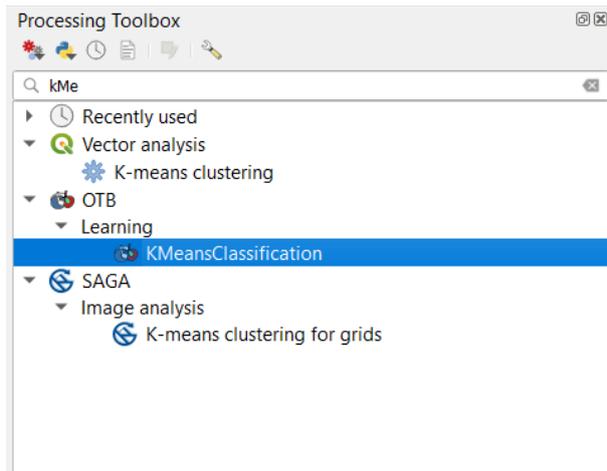
floral communities dominated by the trees which hold broadleaves with an inimitable feature of annual cycle of leaf-on and leaf-off periods means the trees shed their leaves at a particular season of each year, mainly in late winter. Dense forest like Khatra, Ranibandh, Bishnupur, Sonamukhi, Bojora, Gangajal ghati occupies huge areas of the district, Bankura. Currently the land under forest department is approximately 21.5%. About 48% of the forest in this district is degraded type and alarmingly the forest/plant cover is depleting gradually. In addition to ecological utilities, the forests in this district also serve as the basis of livelihood of poor communities of the rural area and the tribes as well. Forests not only provide money but also are important for energy resources in form of fuel and forage for the disadvantaged folks. This type of forest mainly located West, East and South part of the district.

- **Cropland:** Temporarily cropped area followed by harvest and a bare soil period (e.g., single and multiple cropping systems). Different types of crop cultivation and cropping arrangement are specified according to the seasons (e.g., kharif, rabi, zaid). Cropland includes areas are used for the common crop production and are also used for the adapted crops for harvest. Agriculture in Bankura district is dominated by paddy cultivation in kharif season and mustard cultivation in rabi season. A large number of landraces of rice were cultivated by the tribal and rural community of farmers of Bankura district, so far 65 folk rice varieties are produced from Bankura District of West Bengal viz., Dharnagra, Suakalma, Vutmuri, Tulsibhog, Sitasal, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, Badsahabhog, Raghusal, Bhurisal, Khajurchari, Gangajali, Basmati and Kataribhog. Other crops are paddy, wheat, sugarcane, oilseeds etc.,
- **Water Body:** Bankura is drained by three major rivers e.g., Damodar, Darkeswar and Kangsabati along with their tributaries as Gandheswari, Silai and Kumari deserves special consideration. The rivers of the area are flowing from the north-east to the south-west in courses roughly parallel to one another. They are mostly rain-fed, hill streams, originating from hills in the west. The rivers come down in floods after heavy rains and subside as rapidly as they rise. In summer, their sand beds are almost always dry. Damodar river forms the northern boundary of the district along with Bardhaman district for about 72 kilometres and then flows into Bardhaman district. Saliriver which is one of the important tributaries of the Damodar, drains the northern part of the district.
- **Settlement:** Settlement is one of the major land use features. In the study area here almost every place has settlement. Mainly centre to east part of the district are dense population.

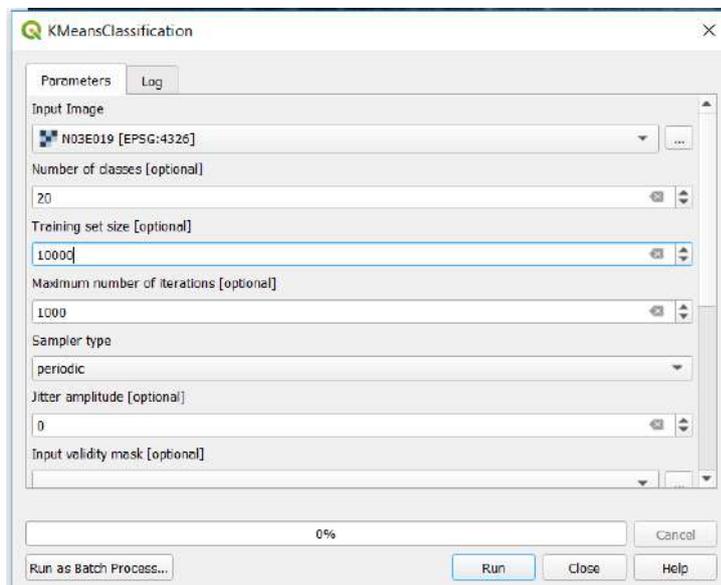
- **Upland:** Here I also noticed that the south, middle and west part of the district have some of uplands. Maximum river are generated from this area.

Unsupervised classification using KMeans Classification in QGIS

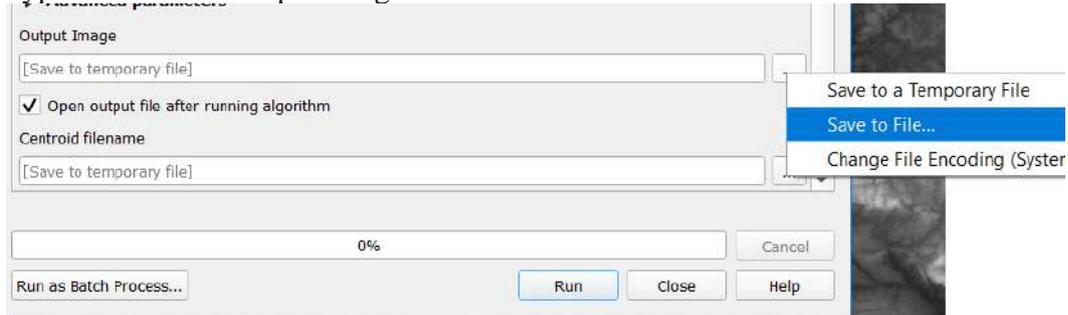
- Add a raster layer in a project **Layer >> Add Layer >> Add Raster Layer**.
- Go to the search box of Processing Toolbox , search **KMeans** and select the **KMeansClassification**.



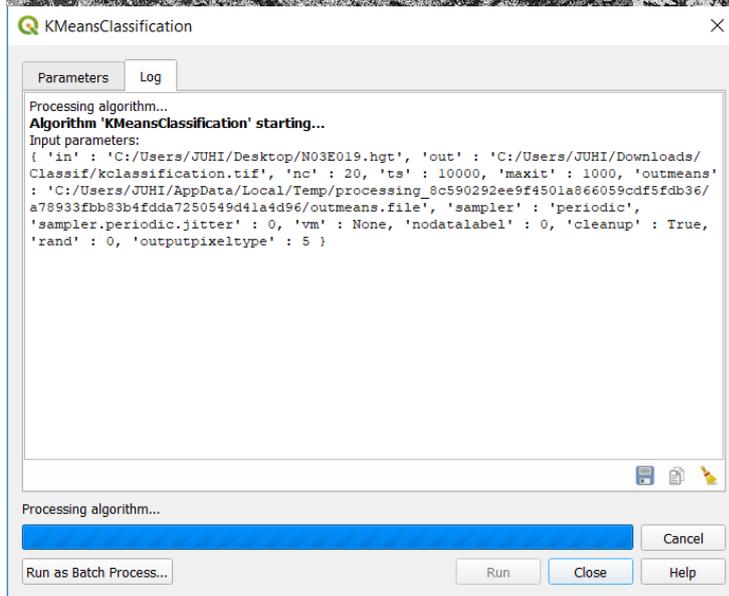
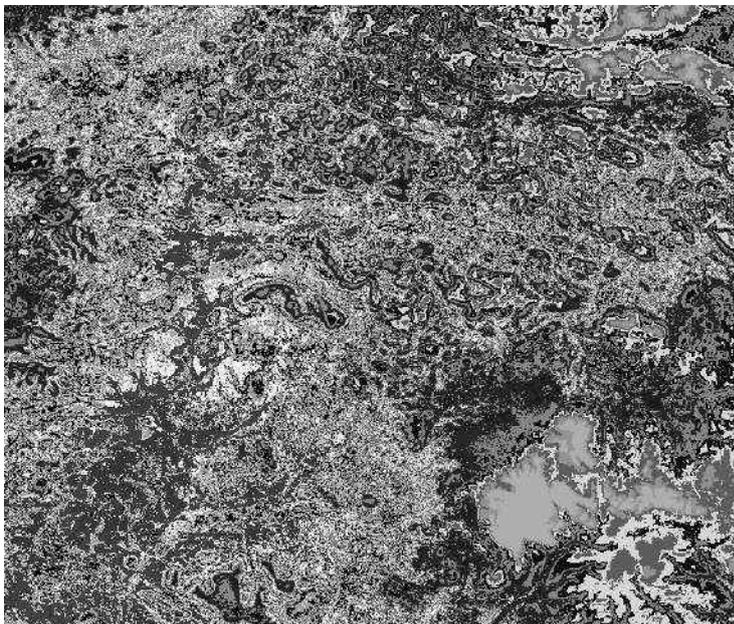
- Select the input image. Type the Number of classes to 20 (default classes are 5) . Fill training size to 10000.



- Type the name of output image save to file.



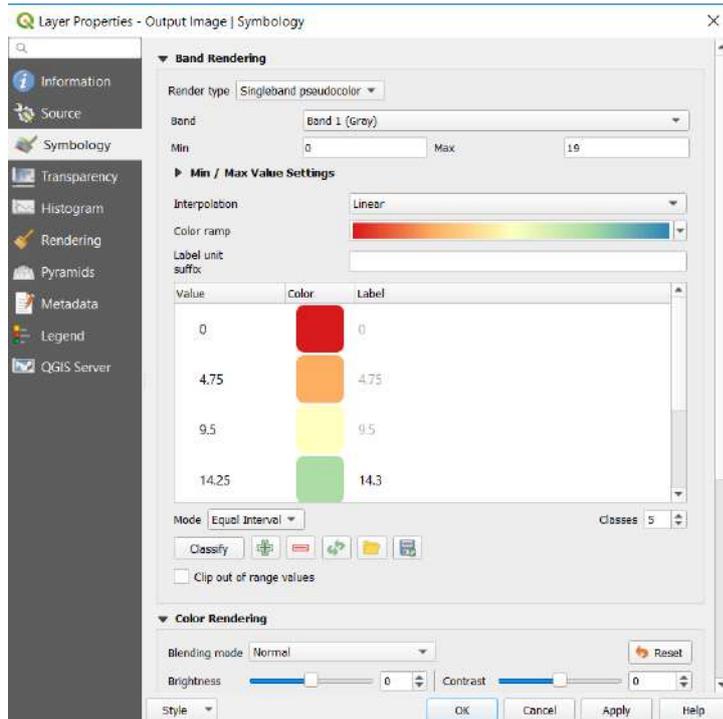
- And in the last tap on **Run**



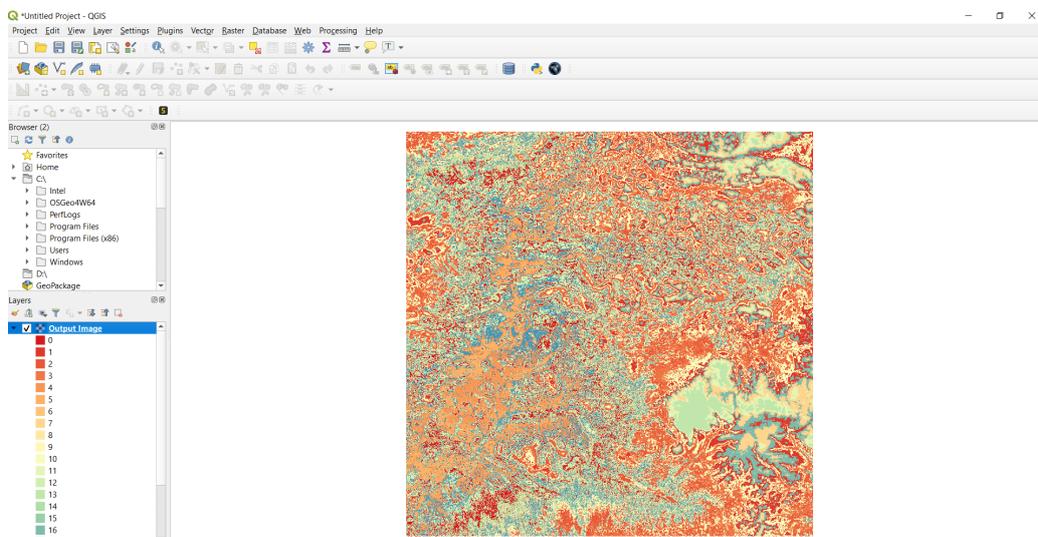
- Output image directly display on canvas. Image is shown below

In the layer panel, right click on the output layer and select **Properties >> Symbology**. Change Render Type **Singleband Pseudocolor**.

- Select the **Color Ramp** (we selected spectral)
- Choose Mode **Equal Interval** (default selection is continuous)
- Change the number of **classes** from 5 to **20**.

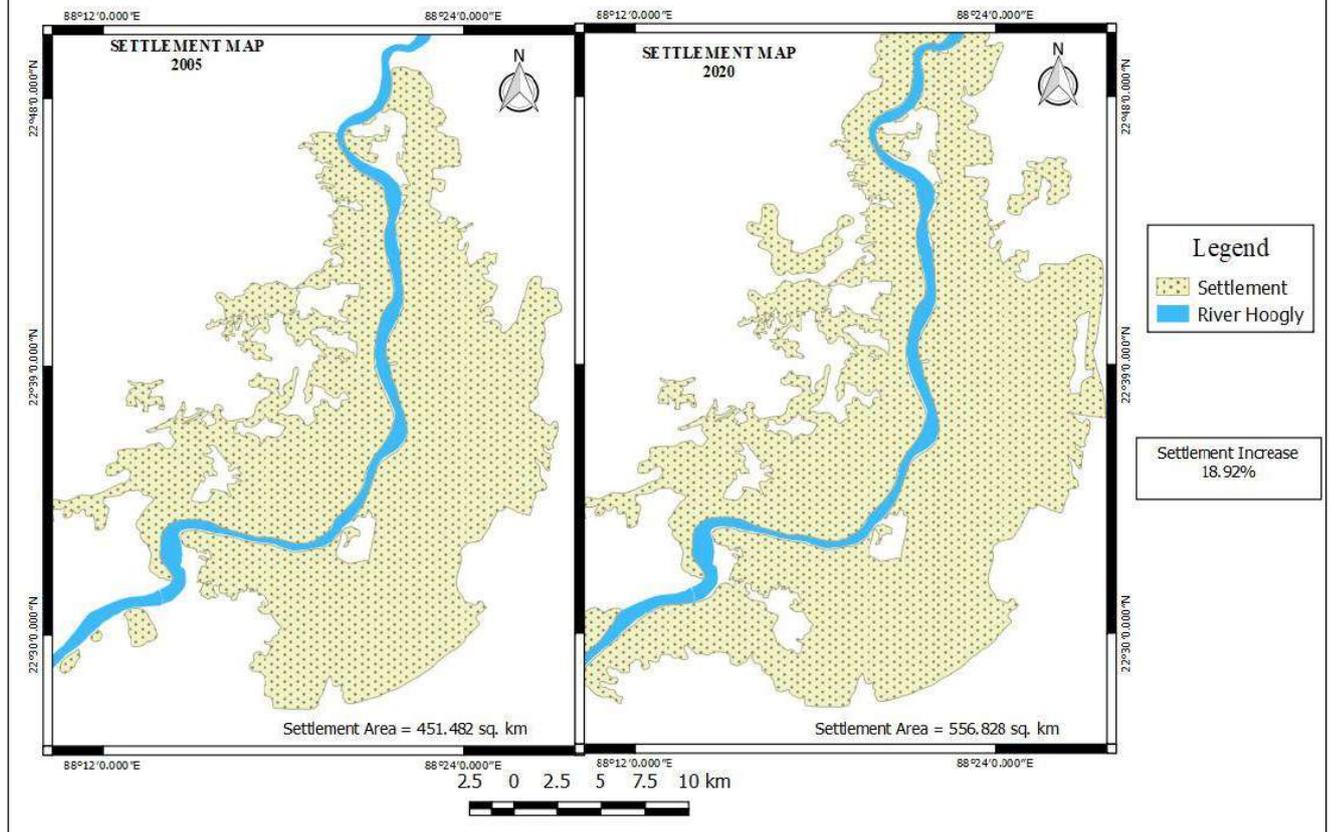


- In the last click on **OK**. Output image is provided below. You can also classify according to discrete interpolation if desired.



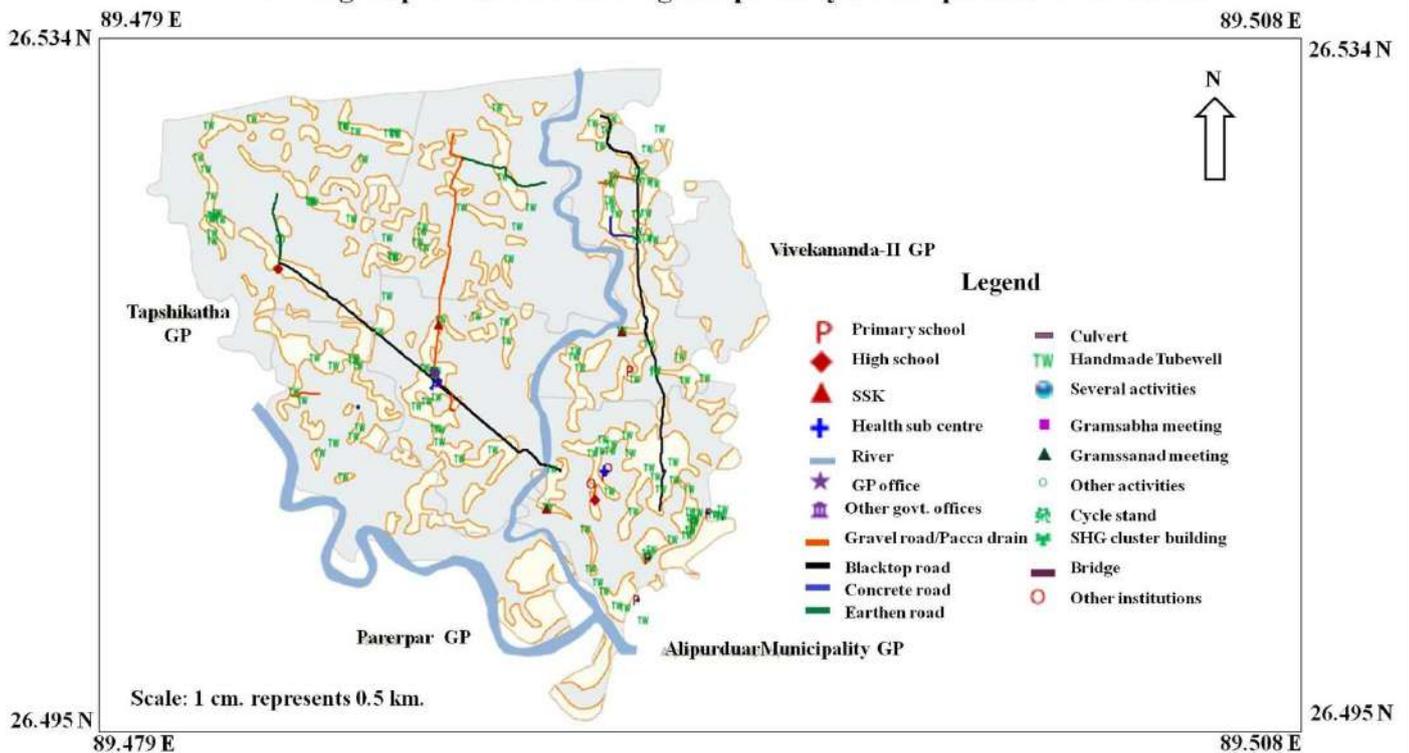
Mapping Of Human Habitation And Detection Of Change From Multi Dated Images

Habitat Change Identification on The Banks of River Hoogly (2005-2020)



SPATIAL PLAN FORMULATION AND LAYOUT FOR A VILLAGE PLANNING

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



INTERPRETATION: Banchukamari is a Village in Alipurduar-i Block in Jalpaiguri District of West Bengal State, India. It belongs to Jalpaiguri Division . It is located 89 KM towards East from District head quarters Jalpaiguri. 4 KM from Alipurduar-I. 530 KM from State capital Kolkata. In this village planning map I put every impotent features. Here we see in village have 2 river one is run west boundary of the village and another is running centre part of the village. I noticed right sight of Centre River have maximum primary school then other side of the river. Also noticed here 2 high school one is west part of village and another is south east part of the village. Handmade tube well is available everywhere in the village. But here only 2 hospital or health centre located in the village. Centre of the village have Gram panchyat and govt. Offices. Here also noticed 2 SSK and one Other institution.

PRACTICAL

Note Book

Regional Planning & Rural Development



Rizwana Sultana

ROLL - BGC/MGF/SIV/21 NO. - 326

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GEOPDSE04P

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UNIT 1

**RURAL RESEARCH METHOD
&
METHODOLOGY**

RESEARCH

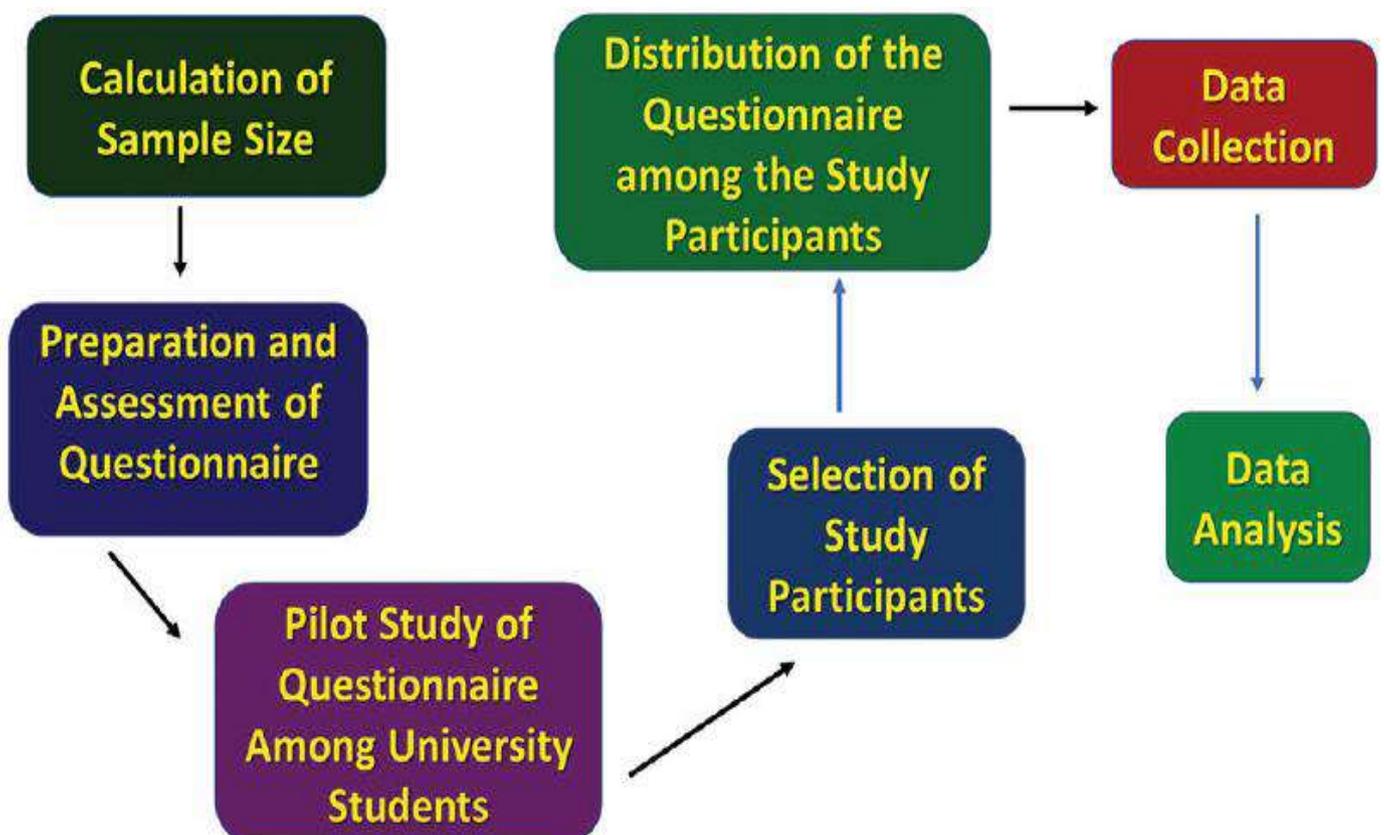
DEFINITION OF RESEARCH:

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist **Earl Robert Babbie**, *“Research Is A Systematic Inquiry To Describe, Explain, Predict, And Control The Observed Phenomenon. It Involves Inductive And Deductive Methods.”*

OBJECTIVES OF RESEARCH:

The Prime Objectives Of Research Are -

1. To Discover New Facts
2. To Verify And Test Important Facts.
3. To Analyse An Event Or Process Or Phenomenon
4. To Identify The Cause And Effect Relationship.
5. To Develop New Scientific Tools, Concepts And Theories To Solve And Understand Scientific And Non scientific Problems.
6. To Find Solutions To Scientific, Non scientific And Social Problems
7. To Overcome Or Solve The Problems Occurring In Our Every Day Life.

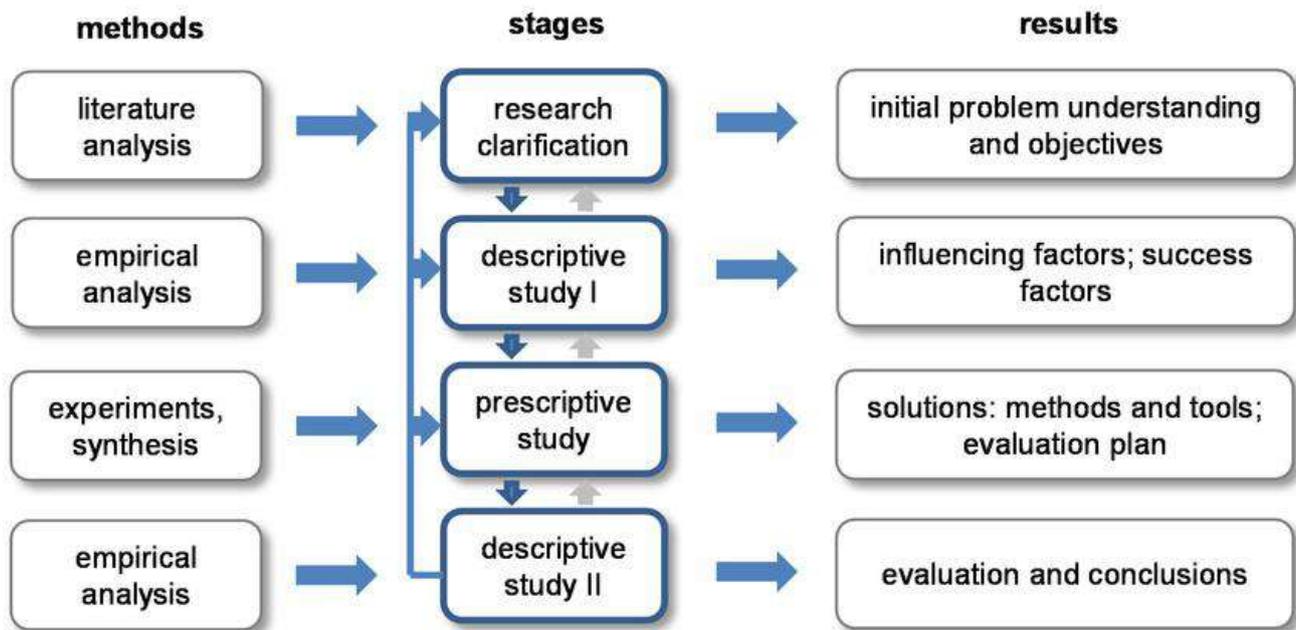


IMPORTANCE OF RESEARCH

Research is important both in scientific and non scientific fields. Some important avenues of research are:

- (1) A research problem refers to a difficulty which a researcher or a scientific community or an industry or a government organization or a society experiences. It may be a theoretical or a practical situation. It calls for a thorough understanding and possible solution.
- (2) Research on existing theories and concepts help us identify the range and applications of them.
- (3) It is the fountain of knowledge and provide guidelines for solving problems.
- (4) Research provides basis for many government policies. For example, research on the needs and desires of the people and on the availability of revenues to meet the needs helps a government to prepare a budget.
- (5) It is important in industry and business for higher gain and productivity and to improve the quality of products.
- (6) Mathematical and logical research on business and industry optimizes the problems in them.
- (7) It leads to the identification and characterization of new materials, new living things, new stars, etc.
- (8) Only through research inventions can be made; for example, new and novel phenomena and processes such as superconductivity and cloning have been discovered only through research.
- (9) Social research helps find answers to social problems. They explain social phenomena and seek solution to social problems.
- (10) Research leads to a new style of life and makes it delightful and glorious.

RESEARCH METHODOLOGY is a systematic way to solve a problem. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. It is also defined as the study of methods by which knowledge is gained. Its aim is to give the work plan of research.



STAGES OF RESEARCH

1. Selection of a research topic
2. Definition of a research problem
3. Literature survey and reference collection
4. Assessment of current status of the topic chosen
5. Formulation of hypotheses
6. Research design
7. Actual investigation
8. Data analysis
9. Interpretation of result
10. Report

STEP – 1: IDENTIFYING THE PROBLEM:

The first and foremost task in the entire process of scientific research is *To Identify A Research Problem*. A well-identified problem will lead the researcher to accomplish all-important phases of the research process, starting from setting objectives to the selection of the research methodology.

STEP – 2: REVIEWING LITERATURE:

A literature review is a survey of scholarly sources on a specific topic. It provides an overview of current knowledge, allowing you to identify relevant theories, methods, and gaps in the existing research.

- **Identify Literature Gap:**

After completed literature review researchers should find the gap, also considered the missing piece or pieces in the research literature, is the area that has not yet been explored or is under-explored. This could be a population or sample (size, type, location, etc.), research method, data collection and/or analysis, or other research variables or conditions.

- **Research Problem:**

A research problem is a specific issue, difficulty, contradiction, or gap in knowledge that you will aim to address in your research. You might look for practical problems aimed at contributing to change, or theoretical problems aimed at expanding knowledge.

STEP- 3:

Setting research questions, objectives, and hypotheses. After discovering and defining the research problem, researchers should make a formal statement of the problem leading to research objectives.

- An **Objective** will precisely say what should be researched, to delineate the type of information that should be collected, and provide a framework for the scope of the study. The best expression of a research objective is a well-formulated, testable research hypothesis.
- A **Hypothesis** is an unproven statement or proposition that can be refuted or supported by empirical data. Hypothetical statements assert a possible answer to a research question.

Step -4:

Choosing the study design.

The **Research Design** is the blueprint or framework for fulfilling objectives and answering research questions. It is a master plan specifying the methods and procedures for **COLLECTING, PROCESSING AND ANALYZING** the collected data. There are **Four** basic research designs that a researcher can use to conduct his or her study;

1. Survey,
2. Experiment,
3. Secondary Data Study,
4. Observational Study.

STEP – 5: DECIDING ON THE SAMPLE DESIGN

Sampling is an important and separate step in the research process. The basic idea of sampling is that it involves any procedure that uses a relatively small number of items or

portions (called a sample) of a universe (called population) to conclude the whole population.

STEP-6: COLLECTING DATA

While deciding about the method of data collection to be used for the study, the researcher should keep in mind two types of data viz., primary and secondary. The primary data are those which are collected afresh and for the first time, and thus happen to be original in character. The secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process.

STEP-7: PROCESSING AND ANALYZING DATA

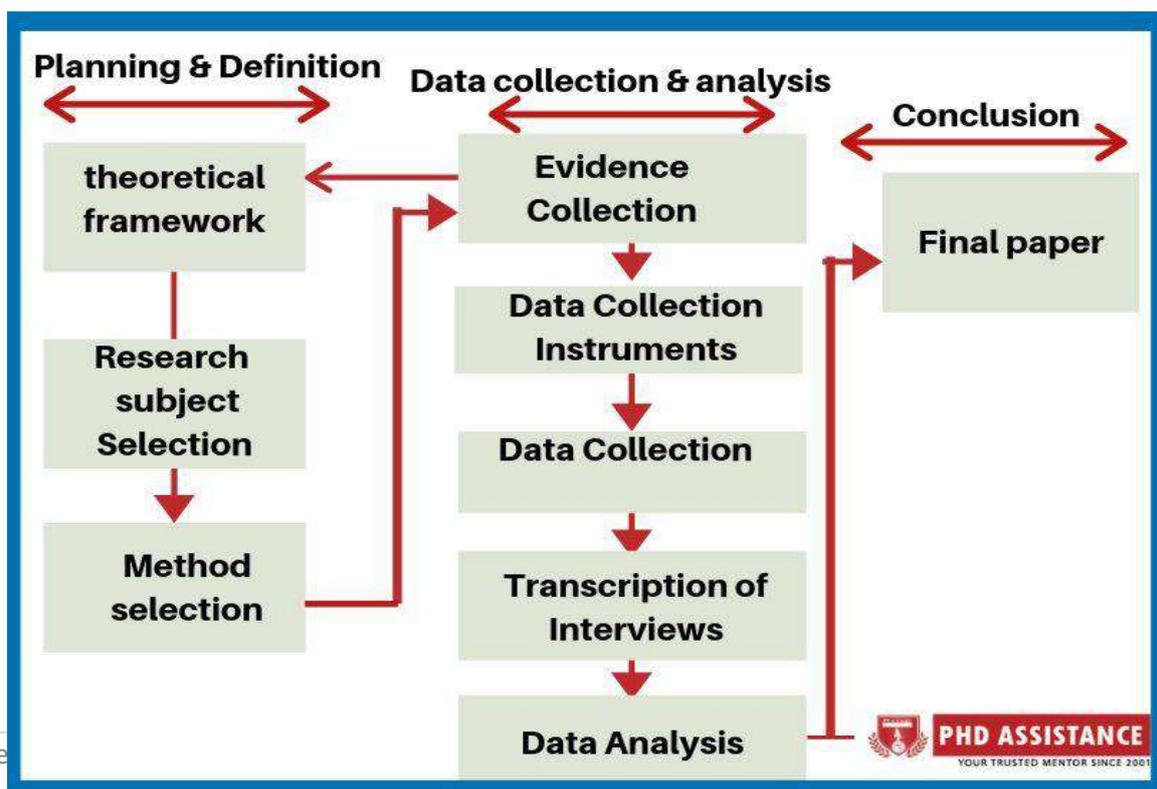
The data, after collection, has to be processed and analysed in accordance with the outline laid down for the purpose at the time of developing the research plan. This is essential for a scientific study and for ensuring that we have all relevant data for making contemplated comparisons and analysis.

STEP-8: WRITING THE REPORT

IDENTIFICATION OF A RESEARCH TOPIC AND PROBLEMS

Some sources of identification of a research topic and problems are the following:

- (1) Theory of one's own interest
- (2) Daily problems
- (3) Technological changes
- (4) Recent trends
- (5) Unexplored areas
- (6) Discussion with experts and research supervisor



GENERAL CLASSIFICATION OF TYPES OF RESEARCH METHODS

Types of research methods can be broadly divided into two **Quantitative** and **Qualitative** categories.

Quantitative Research “describes, infers, and resolves problems using numbers. Emphasis is placed on the collection of numerical data, the summary of those data and the drawing of inferences from the data”.

Qualitative Research, on the other hand, is based on words, feelings, emotions, sounds and other non-numerical and unquantifiable elements. It has been noted that “information is considered qualitative in nature if it cannot be analysed by means of mathematical techniques. This characteristic may also mean that an incident does not take place often enough to allow reliable data to be collected”

Types of Research Design

Quantitative Research Design

1. Experimental Research
2. Correlational Research
3. Survey Research

Qualitative Research Design

1. Grounded Theory Research
2. Ethnographic Research
3. Narrative Research

Combined Qualitative/Quantitative Research Design

1. Mixed Method
2. Action Research

Quantitative Research Design

Type

Descriptive

Correlational

Causal-Comparative

Experimental

Aim

Describe the phenomenon under study using identified variables

Determine the relationship between variables as they exist

Find out if an independent variable affects a dependent variable without manipulating the independent variable

Find out if manipulation of an independent variable affects a dependent variable

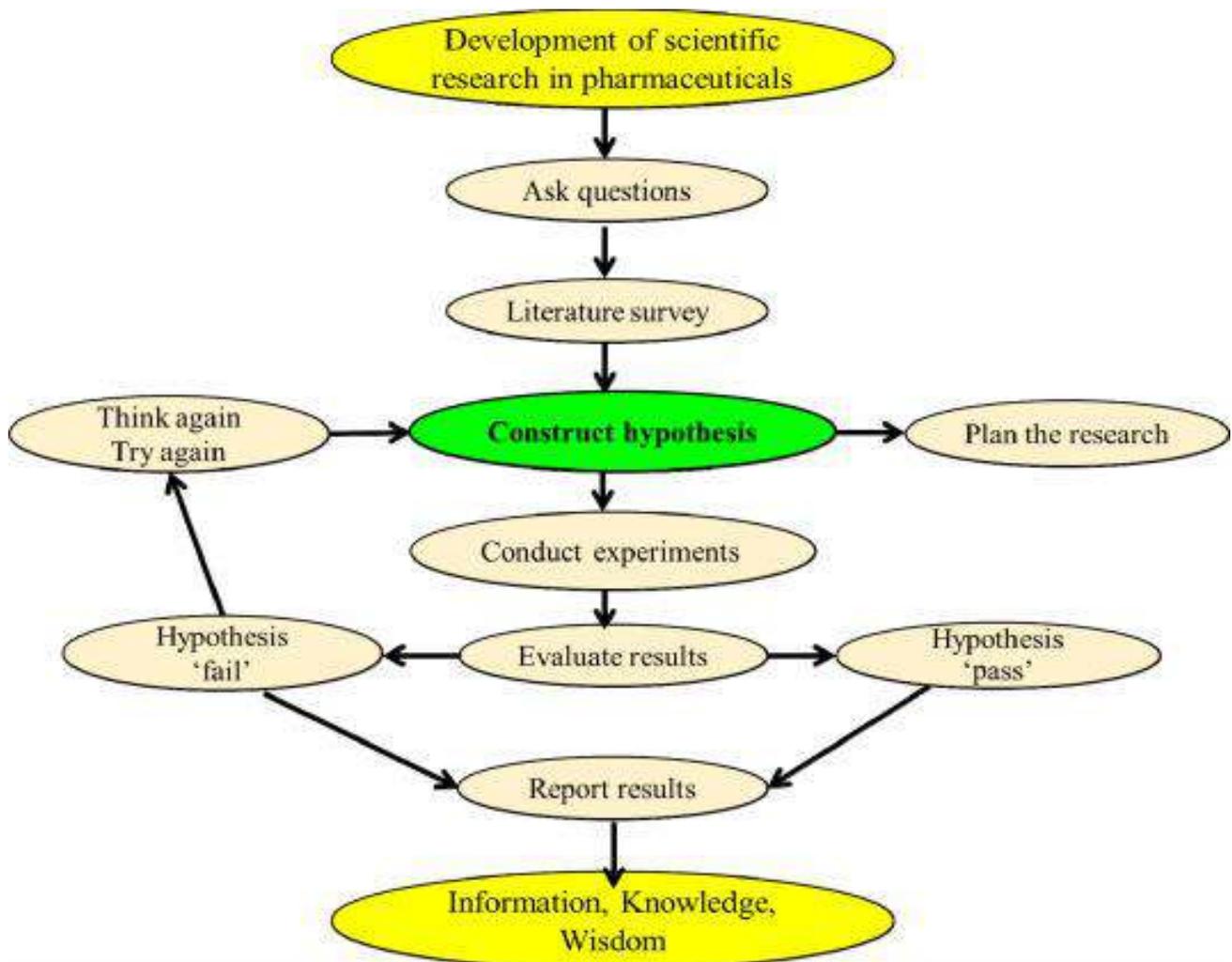
HYPOTHESIS

MEANING OF HYPOTHESIS:

A hypothesis is a scientific guess assumption of any phenomena occurring over the earth's surface. A hypothesis is a conjectural statement of the relation between two or more variables (Kerlinger, 2002).

DEFINITION OF HYPOTHESIS:

According to **Lundberg**, *“A hypothesis is a tentative generalisation, the validity of which remains to be tested. In its most elementary stage, the hypothesis may be any hunch, guess, imaginative idea, which becomes the basis for action or investigation”*.



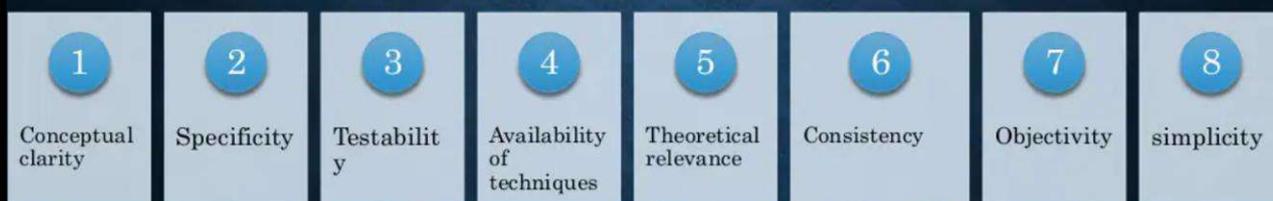
NATURE OF HYPOTHESIS:

The hypothesis is a clear statement of what is intended to be investigated. It should be specified before research is conducted and openly stated in reporting the results.

This allows to:

- ✓ Identify the research objectives.
- ✓ Identify the key abstract concepts involved in the research.
- ✓ Identify its relationship to both the problem statement and the literature review.
- ✓ A problem cannot be scientifically solved unless it is reduced to hypothesis form.
- ✓ It is a powerful tool of advancement of knowledge, consistent with existing knowledge and conducive to further enquiry.
- ✓ It can be tested – verifiable or falsifiable.
- ✓ Hypotheses are not moral or ethical questions.
- ✓ It is neither too specific nor too general.
- ✓ It is a prediction of consequences.
- ✓ It is considered valuable even if proven false.

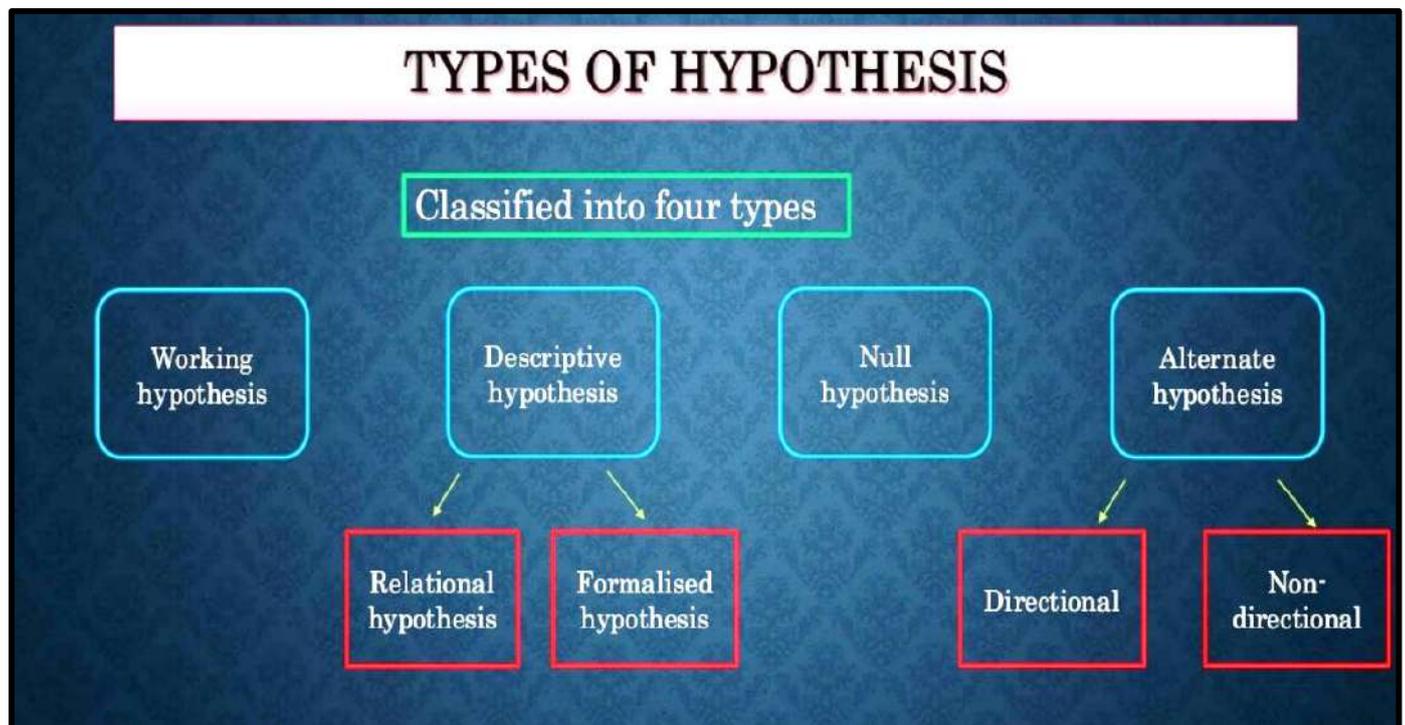
CHARACTERS OF GOOD HYPOTHESIS



CHARACTERISTICS OF A GOOD HYPOTHESIS:

Hulley says a good hypothesis must be based on a good research question. It should be simple, specific and stated in advance. So, a hypothesis could be called as a good hypothesis if it possesses the following characteristics:

- ✓ Hypothesis should be simple so that it is easily understood by everyone.
- ✓ Hypothesis should be clear, specific and precise. If the hypothesis is not clear and precise, the inferences drawn on its basis cannot be taken as reliable.
- ✓ Hypothesis should be capable of being tested.
- ✓ Hypothesis should state relationship between variables.
- ✓ Hypothesis should be consistent with most known facts. i.e. it must be consistent with a substantial body of established facts.
- ✓ The hypothesis must explain the facts that gave rise to the need for explanation. It must actually explain what it claims to explain.



- ✓ **Directional Hypotheses:** These are usually derived from theory. They may imply that the researcher is intellectually committed to a particular outcome. They specify the expected direction of the relationship between variables i.e. the researcher predicts not only the existence of a relationship but also its nature.
- ✓ **Non-Directional Hypotheses:** Used when there is little or no theory, or when findings of previous studies are contradictory. They may imply impartiality. Do not stipulate the direction of the relationship.
- ✓ **Associative Hypotheses:** Propose relationships between variables - when one variable changes, the other changes. Do not indicate cause and effect.
- ✓ **Causal Hypothesis:** Propose a cause and effect interaction between two or more variables. The independent variable is manipulated to cause effect on the dependent

variable. The dependent variable is measured to examine the effect created by the independent variable.

- ✓ **Null Hypothesis:** These are used when the researcher believes there is no relationship between two variables or when there is inadequate theoretical or empirical information to state a research hypothesis. The null hypothesis represents a theory that has been put forward, either because it is believed to be true or because it is to be used as a basis for argument, but has not been proved. Has serious outcome if incorrect decision is made. Designated by: H_0 or H_n .

Null hypotheses can be:

Simple Or Complex

Associative Or Causal

- ✓ **The Alternative Hypothesis:** The alternative hypothesis is a statement of what a hypothesis test is set up to establish. Designated by: H_1 or H_a . It is opposite of Null Hypothesis. It is only reached if H_0 is rejected. Frequently “alternative” is actual desired conclusion of the researcher.

FOCUS GROUP DISCUSSION

What is Focus Group Discussion (FGD)?

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

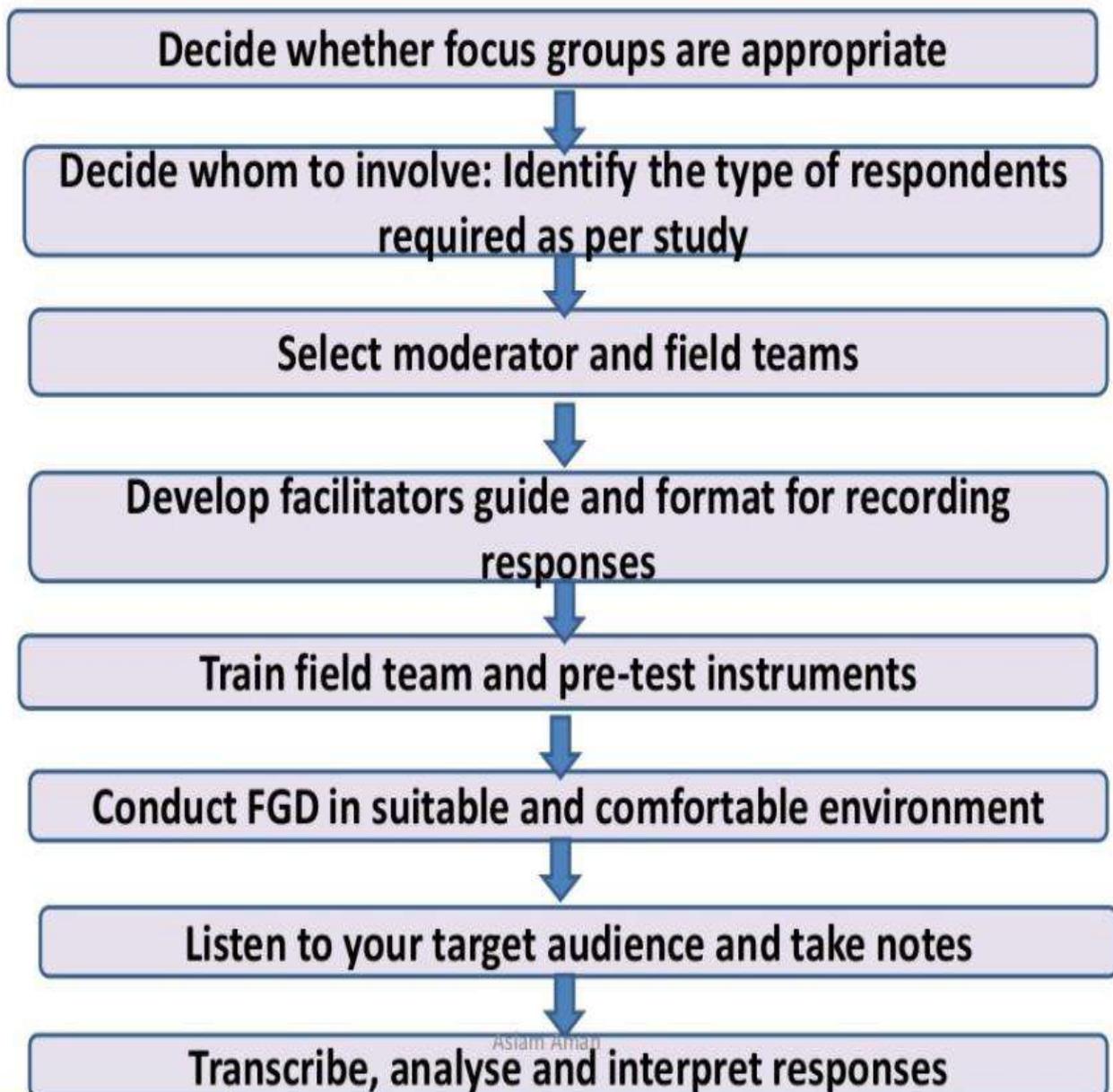


Focus Group	Discussion Group
6-10 people	5-10 people
Should have trained moderator (guides the discussion)	Should have trained facilitator (responsible for the process)
Purpose is to answer a research question or collect data	Purpose is to make decision(s) about research process
Individuals are research participants	Individuals are research partners/ co-researchers
Power is with researcher	Power is shared between researcher and people in the group

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Steps in FGD



WHEN FOCUS GROUPS ARE USED:

Focus groups are used for generating information on collective views, and the meanings that lie behind those views Suggested criteria for using focus groups include:

- As a standalone method, for research relating to group norms, meanings and processes.
- In a multi-method design, to explore a topic or collect group language or narratives to be used in later stages.
- To clarify, extend, qualify or challenge data collected through other methods.
- To feedback results to research participants.
- Morgan suggests that focus groups should be avoided according to the following criteria.
- If listening to participants' views generates expectations for the outcome of the research that cannot be fulfilled.
- If participants are uneasy with each other, and will therefore not discuss their feelings and opinions openly.
- If the topic of interest to the researcher is not a topic the participants can or wish to discuss.
- If statistical data is required. Focus groups give depth and insight, but cannot produce useful numerical results.

Focus Group Modes

	Credibility	Analyzability
Strengths		
Face-to-face	Most similar to natural conversation (dynamic & interactive), facilitates building rapport, can use a broad range of moderator techniques, easily share a broad range of stimuli, refreshments aid cooperation & rapport, immediate distribution of cash incentives.	Can audio &/or video record, visual cues add meaning, verification via observers who offer a different perspective, various data sources – audio, video, in-discussion writing/drawing exercises.
Phone	Scope (wide coverage, more groups, hard-to-reach segments), gaining cooperation (convenience in scheduling, participation), absence of visual cues that may bias, willingness to discuss sensitive topics.	Can audio record, possibly verify via "observers" listening in.
Online (asynchronous)	Scope (wide geographic coverage, hard-to-reach segments), gaining cooperation (convenience of scheduling, participation), detailed responses, sense of anonymity, (potentially) a lot of interaction, moderator/participants can share photos, video, other media.	Built-in transcripts, detailed content to analyze, online platforms offer a high level of functionality, e.g., tagging, word clouds, exporting.

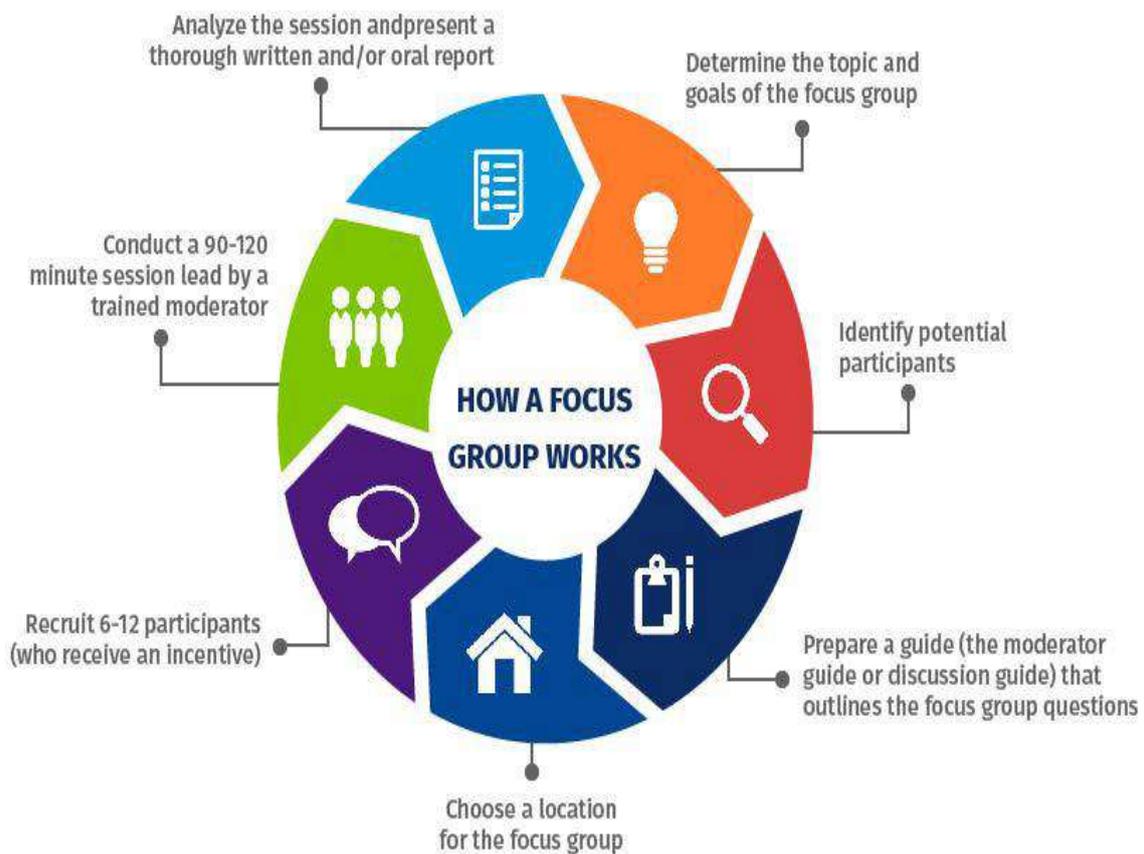
Credibility: Number of groups, gaining cooperation, use of techniques, moderator bias (inappropriate comments, appearance), moderator inconsistency (concept/definition presentation), participant effects (rapport, willingness to share attitudes, paying attention to verbal and visual cues).

Analyzability: Various data sources, participant interaction, transcriptions/transcriptionists, verification (observers).

WHEN IS IT APPROPRIATE TO USE FOCUS GROUP DISCUSSIONS?

Focus group sessions should be considered as a means to explore unknown territory. They are excellent as tools for explaining consumer attitudes and for clarifying and providing a better understanding of the subject matter. Focus group discussions are often used for:

- ✓ Understanding the marketplace and obtaining an insight into how people think and behave.
- ✓ Generating ideas for new products.
- ✓ Developing marketing or advertising themes.
- ✓ Screening or evaluating new product concepts.
- ✓ A disaster check, using prototype products if appropriate, before the introduction of a new product, or before the change of an existing one.
- ✓ Focus groups discussions should not be used as a substitute for quantitative research.



THE USE OF FOCUS GROUP IN THE RESEARCH DESIGN

The goal of a Focus Group is to have the participants understand the topic of interest to the researcher, irrespective of its use, alone or together with other research methods. As discussed previously, FG may be considered as much a stand-alone research method as one

used in conjunction with other methods. the researchers are recognizing the advantages of combining qualitative and quantitative research methods:

- ✓ can precede a quantitative research method. In this case, it helps the researcher to learn the vocabulary of a field and to discover the public thought, in addition to supplying indications of special problems that can arise in the next phase using a quantitative research method.
- ✓ can be used at the same time as quantitative research method. In this case, the objective is triangulation; that is, the use of two or more different methods, in a complementary way, for the same research subject.
- ✓ can follow a quantitative research method. In this case, Focus Groups can explore or to illuminate topics that have emerged in the analysis of the results of the quantitative research method. Finally, it can be affirmed that the objective of the FG application defines its role in the research design.

UNIT – 3
TECHNIQUES
&
FORMULATION OF RURAL PLANNING THROUGH
DATA ANALYSIS

SWOT ANALYSIS

What Is a SWOT Analysis?

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats, and so a SWOT Analysis is a technique for assessing these four aspects of your business.

You can use SWOT Analysis to make the most of what you've got, to your organization's best advantage. And you can reduce the chances of failure, by understanding what you're lacking, and eliminating hazards that would otherwise catch you unawares.

Better still, you can start to craft a strategy that distinguishes you from your competitors, and so compete successfully in your market.

SWOT Analysis Example

<p><u>Strengths</u></p> <ul style="list-style-type: none">Work ExperienceEducationTechnical ExpertiseTransferable SkillsPersonal CharacteristicsGood networking contactsAssociations, Business groups	<p><u>Weaknesses</u></p> <ul style="list-style-type: none">Lack of Work ExperienceLimited Education, Wrong MajorLimited Technical KnowledgeLack of Job KnowledgeWeak Interpersonal SkillsNegative Personal Characteristics
<p><u>Opportunities</u></p> <ul style="list-style-type: none">Positive Trends in Your FieldEnhancing EducationFields in Need of Your SkillsGeography – ability to moveStrengthening Your NetworkUtilizing Skills in Different WayEnhancing Personal Development	<p><u>Threats</u></p> <ul style="list-style-type: none">Negative Trends in Your FieldCompetition in Your FieldTraining & Education ObstaclesLimited Advancement in FieldLimited Ability to DevelopLimited Positions in Your Area

15 Oct 13

A SWOT analysis can offer helpful perspectives at any stage of an effort. You might use it to:

- Explore possibilities for new efforts or solutions to problems.

- Make decisions about the best path for your initiative. Identifying your opportunities for success in context of threats to success can clarify directions and choices.
- Determine where change is possible. If you are at a juncture or turning point, an inventory of your strengths and weaknesses can reveal priorities as well as possibilities.
- Adjust and refine plans mid-course. A new opportunity might open wider avenues, while a new threat could close a path that once existed.

SWOT also offers a simple way of communicating about your initiative or program and an excellent way to organize information you've gathered from studies or surveys.

How to do a SWOT analysis the right way

As I mentioned above, you want to gather a team of people together to work on a SWOT analysis. You don't need an all-day retreat to get it done, though. One or two hours should be more than plenty.

1. Gather the right people

Gather people from different parts of your company and make sure that you have representatives from every department and team. You'll find that different groups within your company will have entirely different perspectives that will be critical to making your SWOT analysis successful.

2. Throw your ideas at the wall

Doing a SWOT analysis is similar to brainstorming meetings, and there are right and wrong ways to run them. I suggest giving everyone a pad of sticky-notes and have everyone quietly generate ideas on their own to start things off. This prevents groupthink and ensures that all voices are heard.

After five to 10 minutes of private brainstorming, put all the sticky-notes up on the wall and group similar ideas together. Allow anyone to add additional notes at this point if someone else's idea sparks a new thought.

3. Rank the ideas

Once all of the ideas are organized, it's time to rank the ideas. I like using a voting system where everyone gets five or ten "votes" that they can distribute in any way they like. Sticky dots in different colors are useful for this portion of the exercise.

Based on the voting exercise, you should have a prioritized list of ideas. Of course, the list is now up for discussion and debate, and someone in the room should be able to make the final call on the priority. This is usually the CEO, but it could be delegated to someone else in charge of business strategy.

Population Composition

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

- **The Age Structure**

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way, people live their lives.

- **The Sex Ratio**

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population.

In some countries, like U.S.A, the sex ratio is expressed in terms of number of males per thousand females and is calculated by using the formula:

$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of males per thousand females.

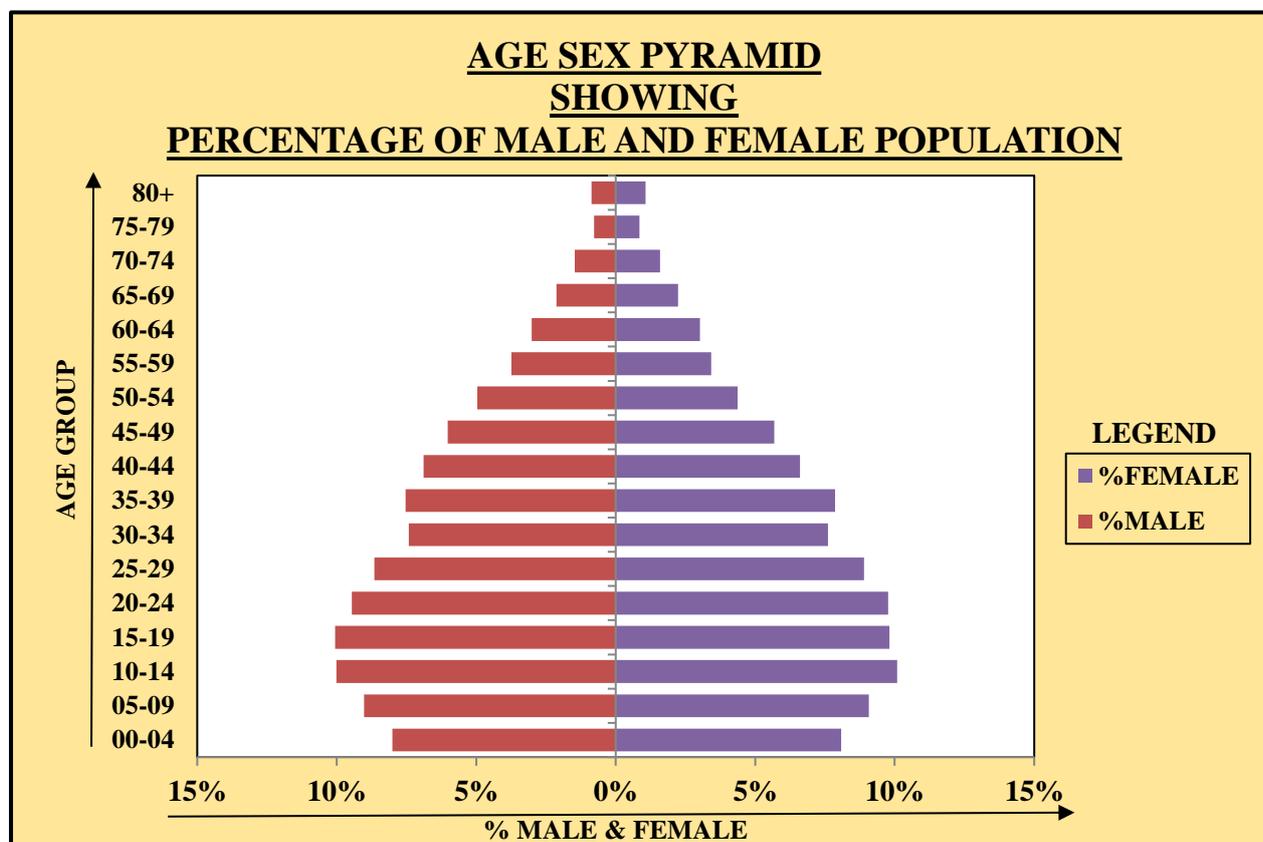
In India, the sex ratio is calculated in terms of number of females per thousand males. It is calculated as under

$$\frac{\text{Male population}}{\text{Female population}} \times 1000$$

Or the number of females per thousand males.

TABLE SHOWING CALCULATION FOR AGE SEX PYRAMID

AGE GROUP	MALE	FEMALE	TOTAL	%MALE	%FEMALE
00-04	3743862	3589281	7333143	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%
65-69	991280	991713	1982993	-2%	2%
70-74	686881	703726	1390607	-1%	2%
75-79	360216	379551	739767	-1%	1%
80+	406536	477025	445803	-1%	1%
TOTAL	46745275	44418389	90725906	-100%	100%



INTERPRETATION

- In this pyramid the bottom heavy i.e. the population has a larger proportion of children, teenagers and young adults.
- The country's population for the age cohorts of 0-4, 5-9, 10-14 and 15-19 is roughly equal, whereas the numbers for older groups become progressively smaller.
- This means that the country's younger age groups have stopped growing in numbers now and are likely to shrink slightly soon.
- Except for the oldest groups, It have more males than females for every cohort.

Dependency Ratio

The dependency ratio is an age population ratio of those typically not in the labour force (the dependent part ages 0 to 14 and 65+) and those typically in the labour force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

Dependency Ratio Formula

$$\text{Dependency Ratio} = \frac{(\text{number of people aged 0 to 14}) + (\text{number of people aged 65 and over})}{\text{number of people aged 15 to 64}} \times 100$$

TABLE SHOWING CALCULATION

FOR

DEPENDENCY RATIO

AGE GROUP	MALE	FEMALE	TOTAL		
00-04	37,43,862	35,89,281	7333143		
05-09	42,16,763	40,31,046	8247809	24737475	
10-14	46,77,506	44,79,017	9156523		
15-19	47,02,325	43,55,706	9058031		40.26985609
20-24	44,22,630	43,35,692	8758322		
25-29	40,44,904	39,53,005	7997909		
30-34	34,64,659	33,76,931	6841590		
35-39	35,23,361	34,89,285	7012646	61429261	47.6916774
40-44	32,19,604	29,33,456	6153060		
45-49	28,14,212	25,21,507	5335719		
50-54	23,17,232	19,40,648	4257880		47.69167742
55-59	17,46,903	15,21,747	3268650		
60-64	14,06,401	13,39,053	2745454		
65-69	9,91,280	9,91,713	1982993		
70-74	6,86,881	7,03,726	1390607		7.421821337
75-79	3,60,216	3,79,551	739767	4559170	
80+	4,06,536	4,77,025	445803		
TOTAL	4,67,45,275	4,44,18,389	90725906		

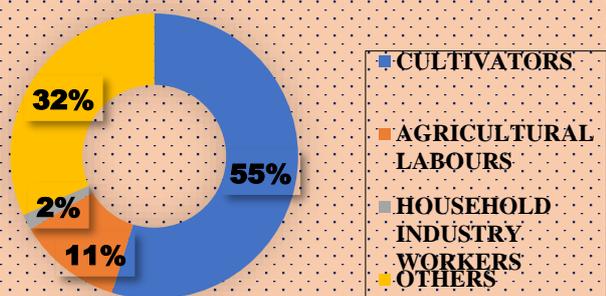
Occupational Structure

The working population takes place in various occupations ranging from agriculture, forestry, fishing, manufacturing, construction, commercial transport, services, communication and other unclassified services. Agriculture, forestry, fishing and mining are classified as primary activities, manufacturing as secondary, transport, communication and other services as tertiary and the jobs related to research and developing ideas as quaternary activities. The proportion of working population engaged in these four sectors is a good indicator of the levels of economic development of a nation. A developed economy with industries can accommodate more workers in the secondary, tertiary and quaternary sector. If the economy is in primitive stages, then the proportion of people engaged in primary activities would be high.

TABLE SHOWING CALCULATION FOR OCCUPATIONAL STRUCTURE OF DIFFERENT STATES IN INDIA, 1991-2001

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
ARUNACHAL PRADESH	57.8	60.8	3.9	5.4	1.3	0.2	37	33.7
ASSAM	39.1	54.8	13.2	12.6	3.6	1	44	31.7
MANIPUR	40.2	59.9	12	10.3	10.3	6	37.6	23.3
MEGHALAYA	48.1	56.3	17.7	13	2.2	0.4	32	30.3
MIZORAM	54.9	62.3	5.7	5.4	1.5	1.1	37.9	31.2
NAGALAND	64.7	72.6	3.6	1.6	2.6	0.4	29.0	26
TRIPURA	27	39	23.8	24.2	3	1.6	46.1	35.2
SIKKIM	49.9	58	6.5	8.2	1.6	0.8	42	33.1
WEST BENGAL	19.2	29.2	25	25	7.4	4.2	48.5	41.5
TOTAL	400.9	492.9	111.4	105.7	33.5	15.7	325.1	286

OCCUPATIONAL STRUCTURE IN 1991



OCCUPATIONAL STRUCTURE IN 2001

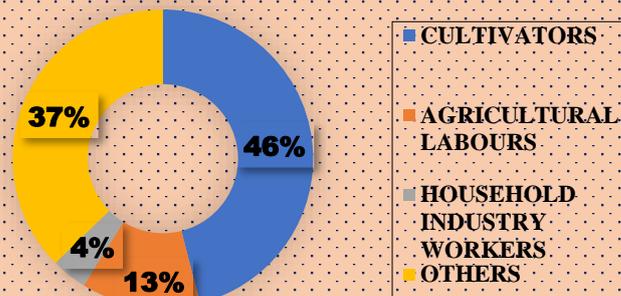


TABLE SHOWING INDUSTRIAL COMPOSITION OF ARUNACHAL PRADESH

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
ARUNACHAL PRADESH	57.8	60.8	3.9	5.4	1.3	0.2	37	33.7

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF ARUNACHAL PRADESH (1991-2001)

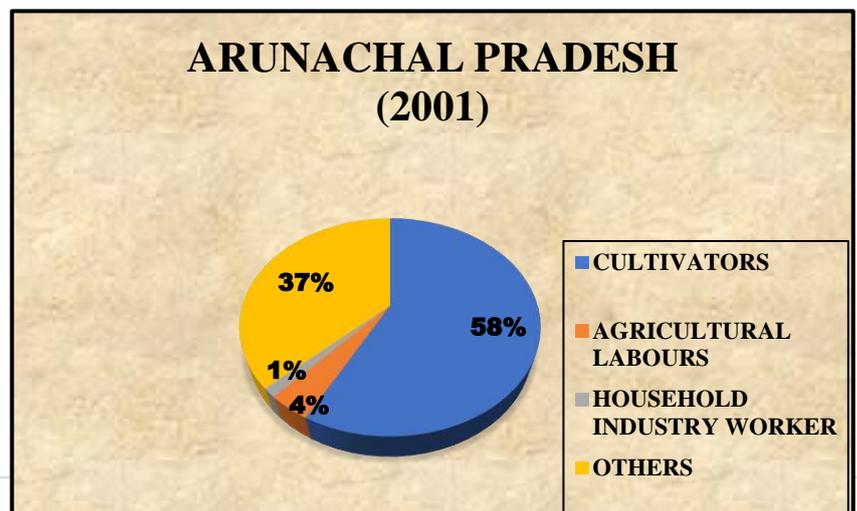
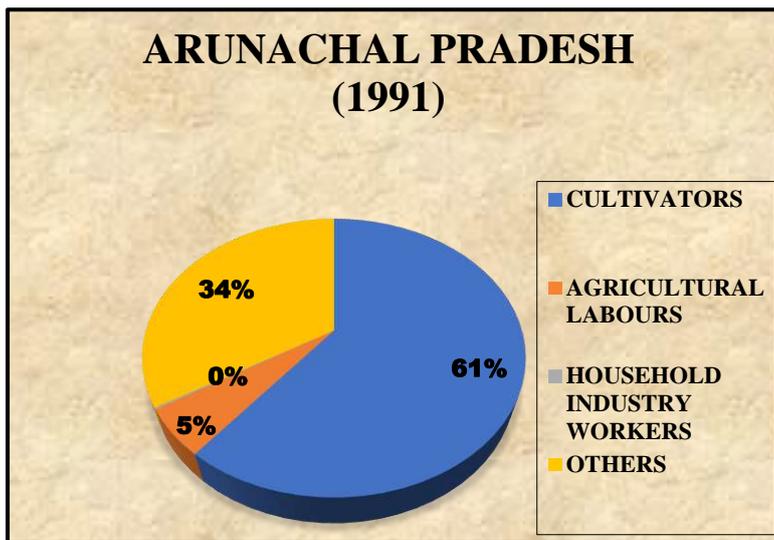


TABLE SHOWING INDUSTRIAL COMPOSITION OF ASSAM

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
ASSAM	39.1	54.8	13.2	12.6	3.6	1	44	31.7

(1991-2001)

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF ASSAM

(1991-2001)

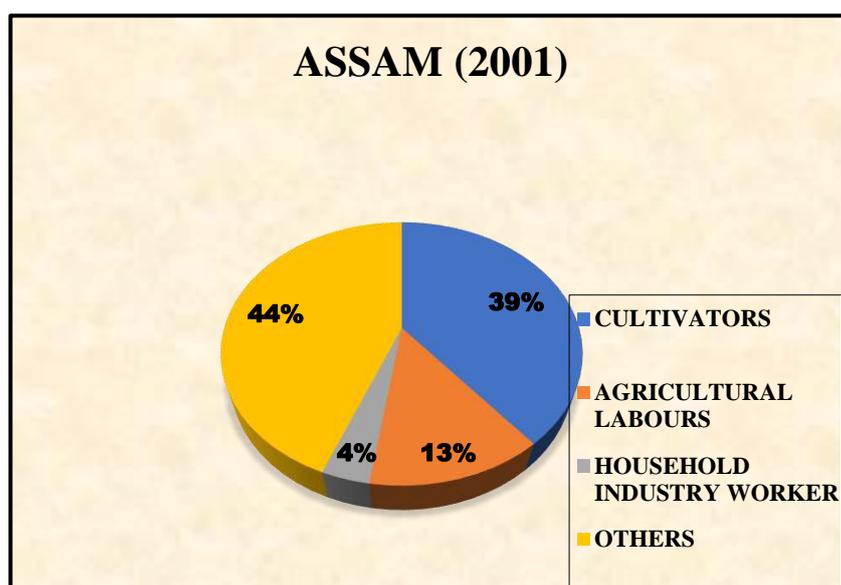
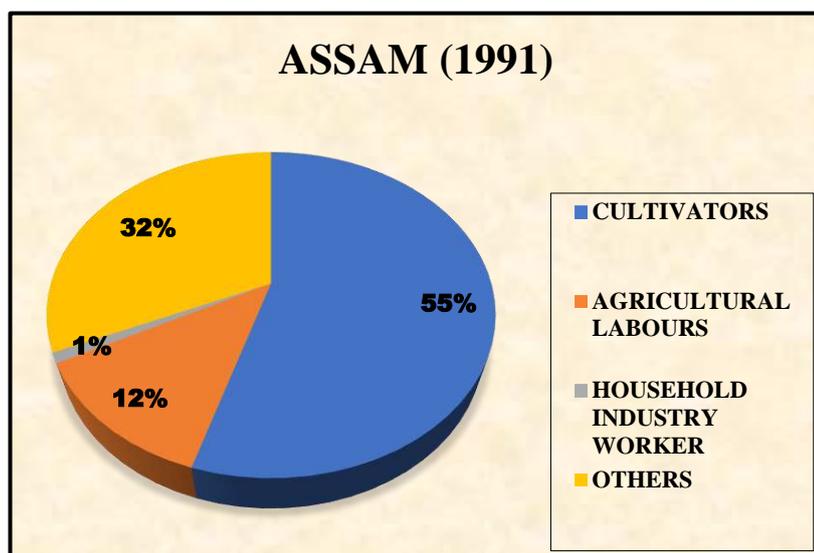


TABLE SHOWING INDUSTRIAL COMPOSITION OF MANIPUR

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
MANIPUR	40.2	59.9	12	10.3	10.3	6	37.6	23.3

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF MANIPUR

(1991-2001)

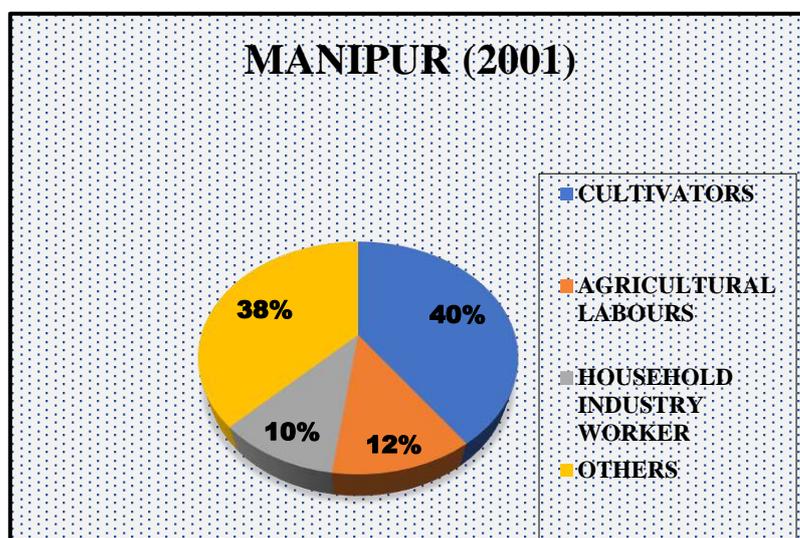
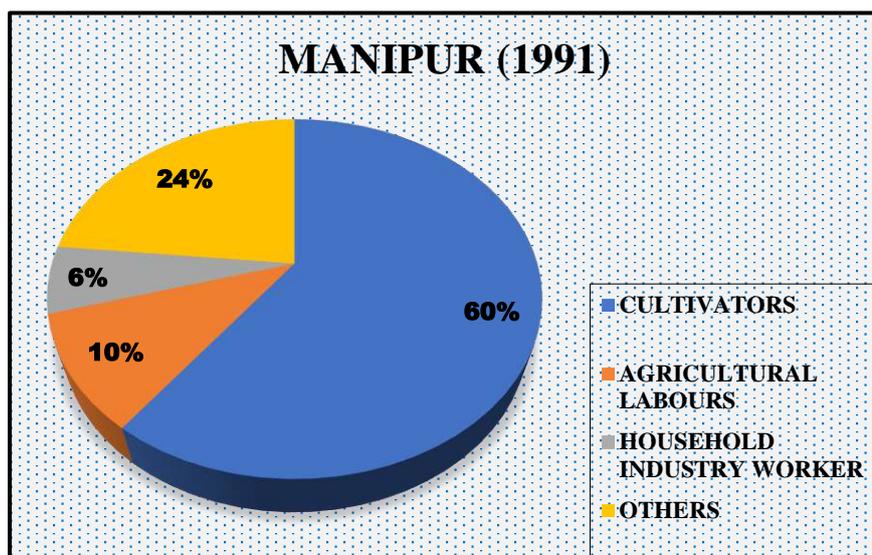


TABLE SHOWING INDUSTRIAL COMPOSITION OF MEGHALAYA

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
MEGHALAYA	48.1	56.3	17.7	13	2.2	0.4	32	30.3

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF MEGHALAYA

(1991-2001)

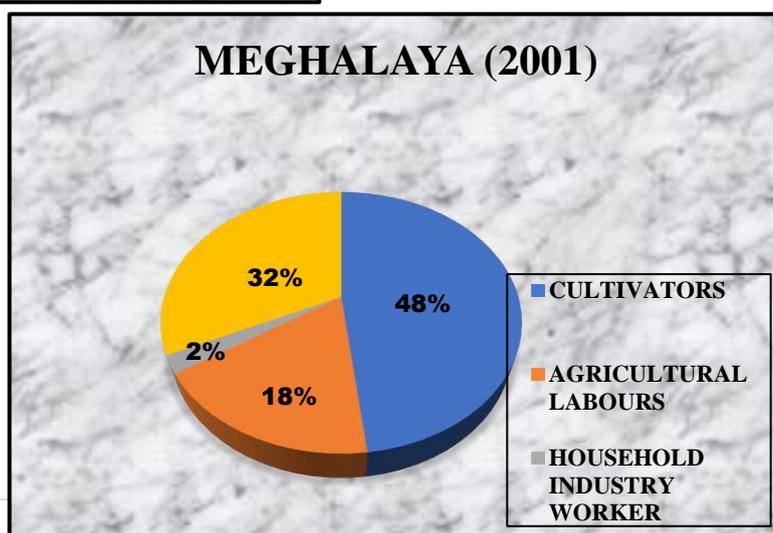
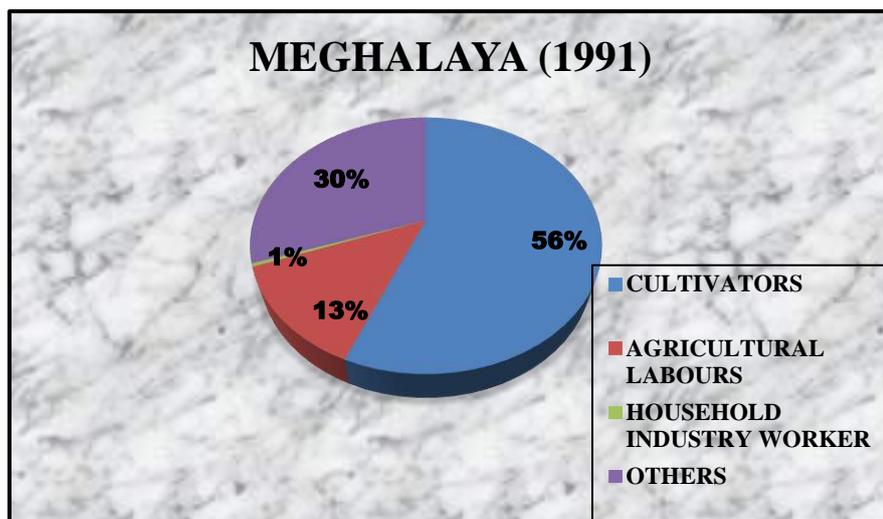


TABLE SHOWING INDUSTRIAL COMPOSITION OF MIZORAM

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
MIZORAM	54.9	62.3	5.7	5.4	1.5	1.1	37.9	31.2

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF MIZORAM

(1991-2001)

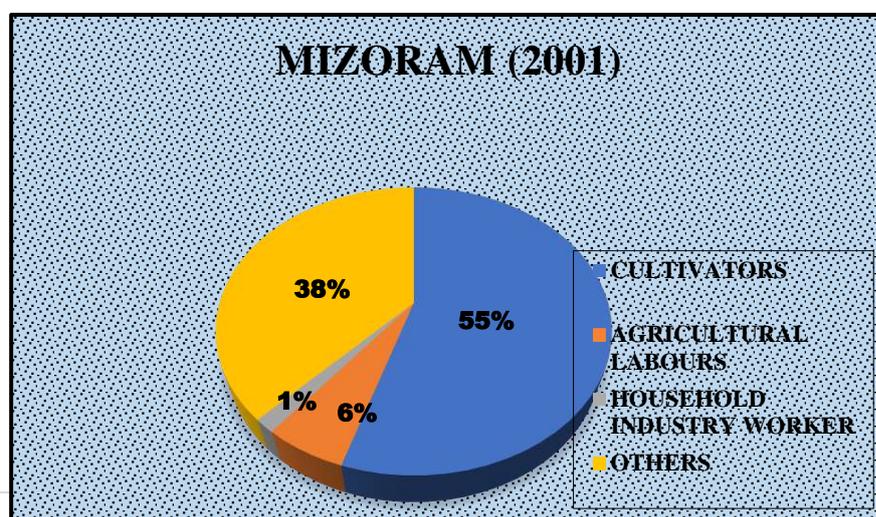
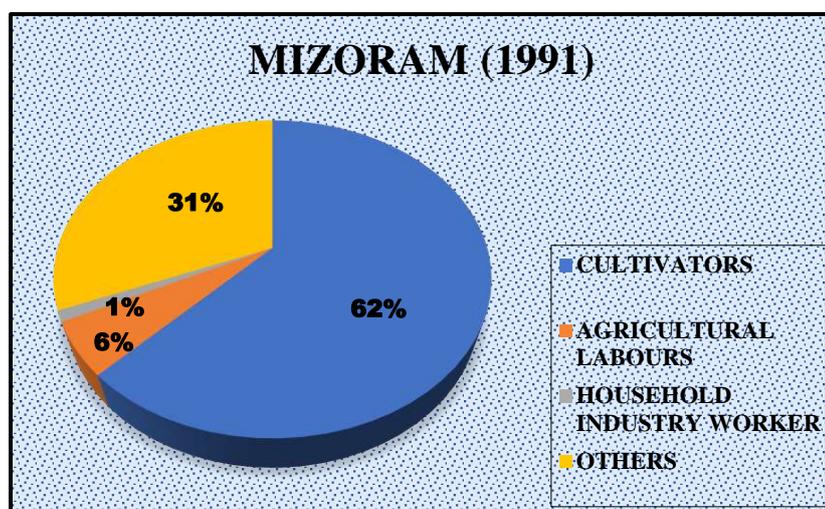


TABLE SHOWING INDUSTRIAL COMPOSITION OF NAGALAND

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
NAGALAND	64.7	72.6	3.6	1.6	2.6	0.4	29.0	26

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF NAGALAND

(1991-2001)

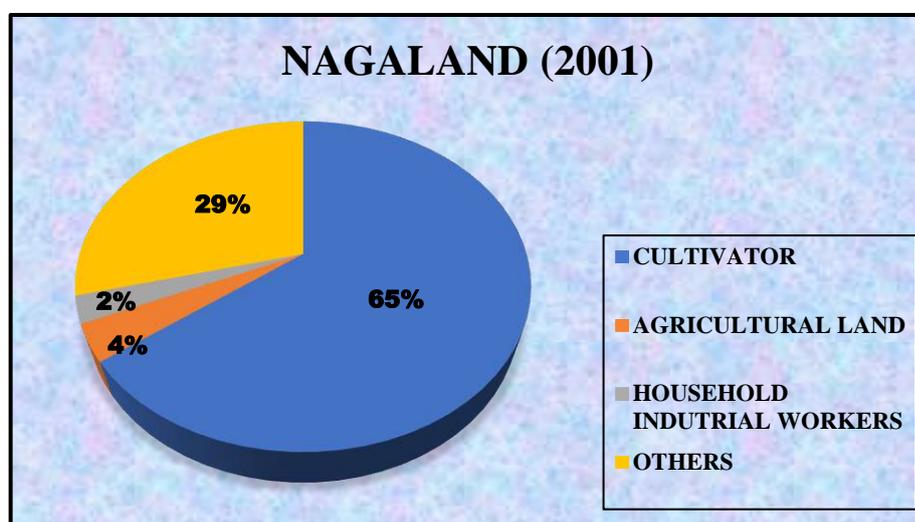
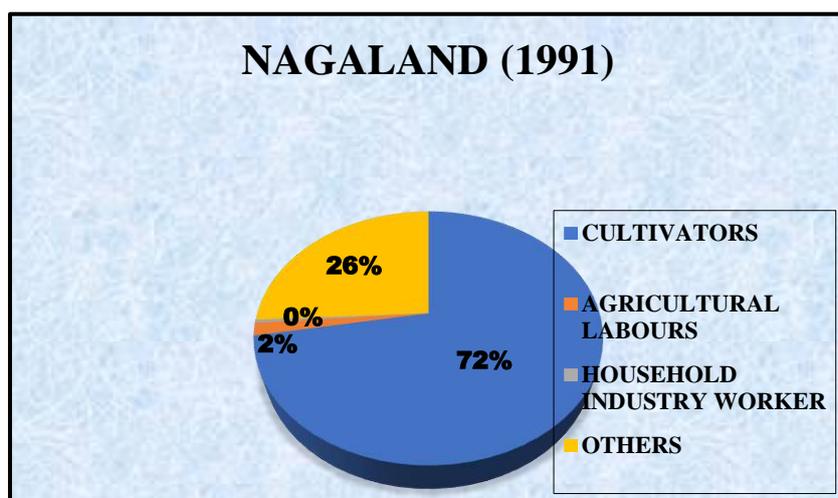


TABLE SHOWING INDUSTRIAL COMPOSITION OF TRIPURA

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
TRIPURA	27	39	23.8	24.2	3	1.6	46.1	35.2

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF TRIPURA

(1991-2001)

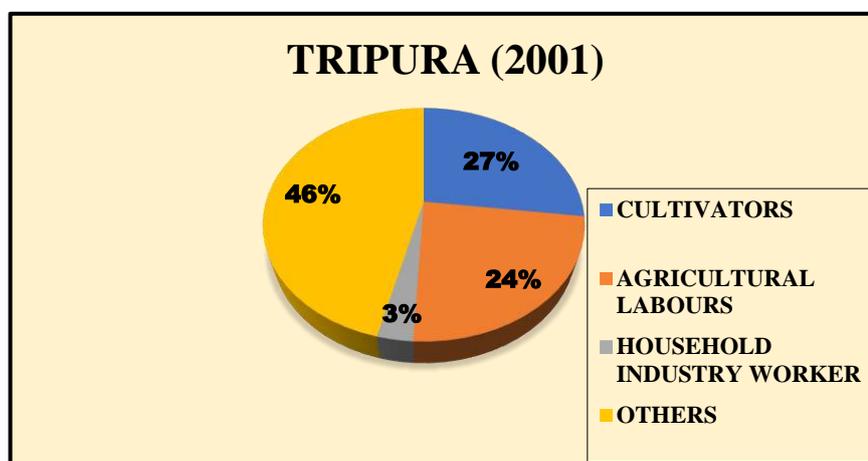
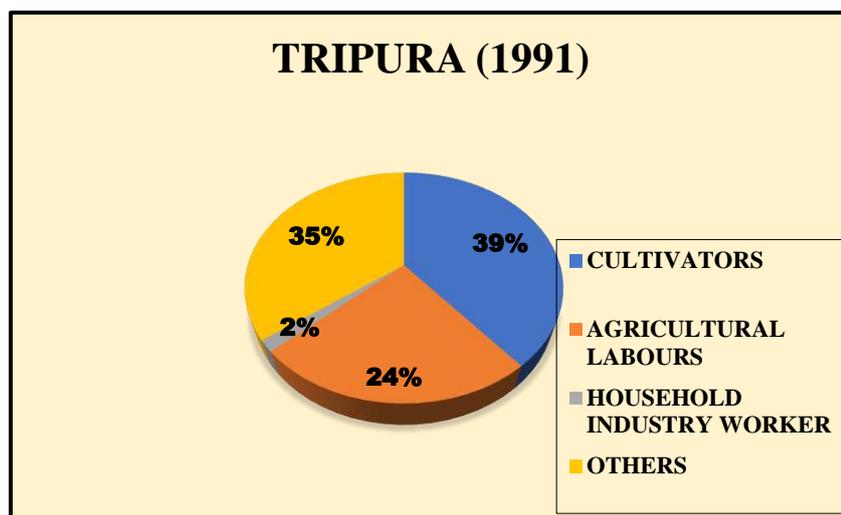


TABLE SHOWING INDUSTRIAL COMPOSITION OF SIKKIM

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
SIKKIM	49.9	58	6.5	8.2	1.6	0.8	42	33.1

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF SIKKIM

(1991-2001)

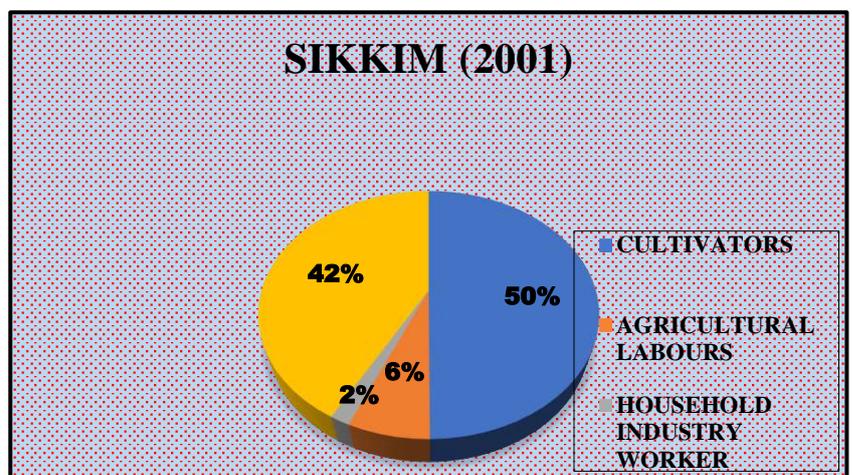
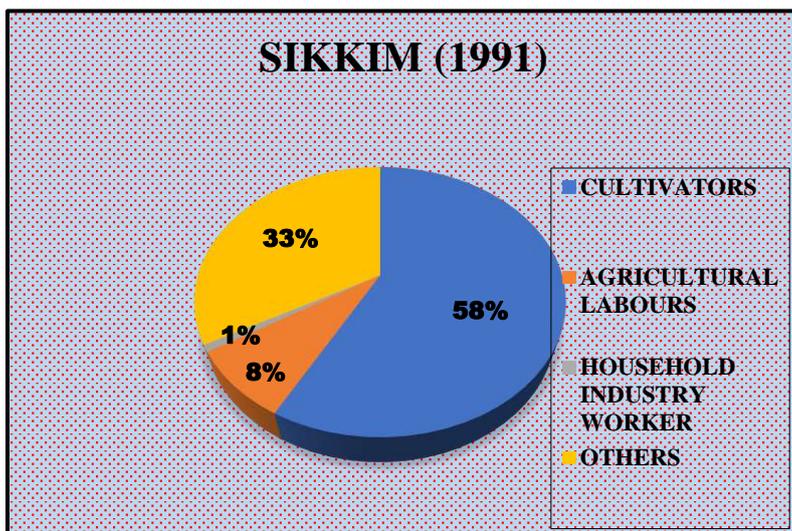


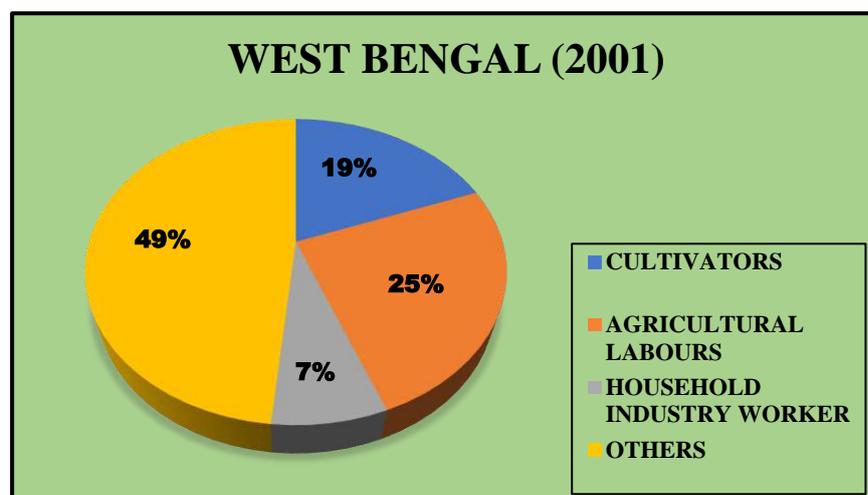
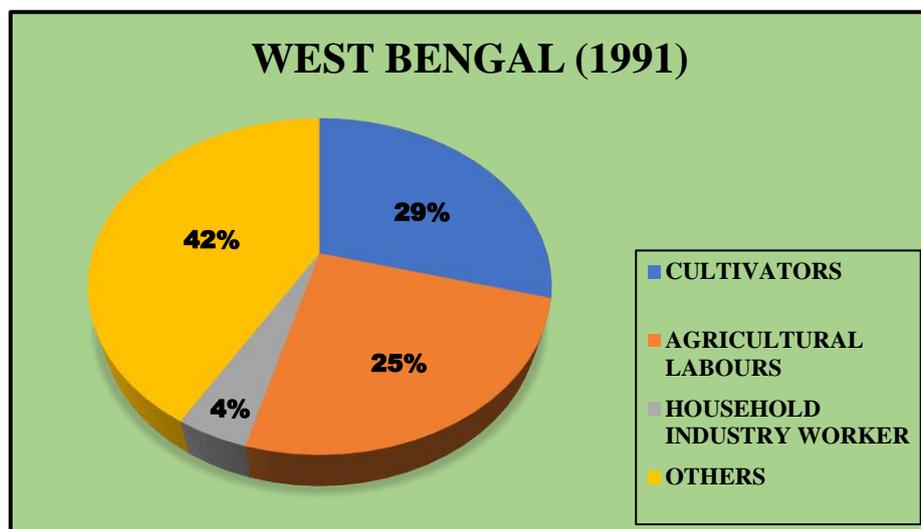
TABLE SHOWING INDUSTRIAL COMPOSITION OF WEST BENGAL

(1991-2001)

STATES	CULTIVATORS		AGRICULTURAL LABOURS		HOUSEHOLD INDUSTRY WORKERS		OTHERS	
	2001	1991	2001	1991	2001	1991	2001	1991
WEST BENGAL	19.2	29.2	25	25	7.4	4.2	48.5	41.5

PIE DIAGRAM SHOWING INDUSTRIAL COMPOSITION OF WEST BENGAL

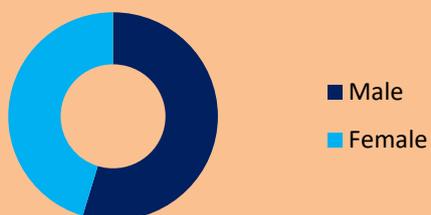
(1991-2001)



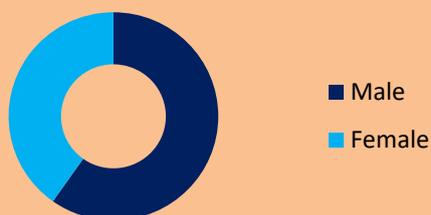
WORK PARTICIPATION RATE NORTH-EASTERN STATES OF INDIA (2001)

STATE	MALE	FEMALE
Mizoram	57.3	47.5
Sikkim	57.4	38.6
Arunachal Pradesh	50.6	36.5
Manipur	48.1	39
Nagaland	46.7	38.1
Meghalaya	48.3	35.1
Tripura	50.6	21.1
Assam	49.9	20.7

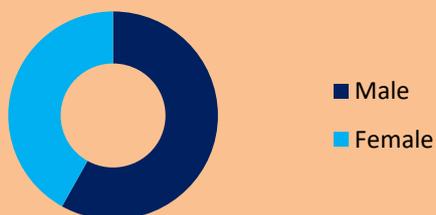
Mizoram



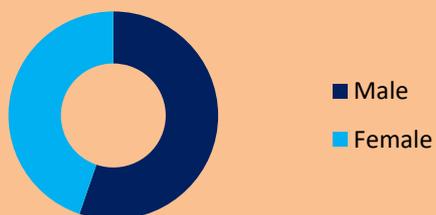
Sikkim



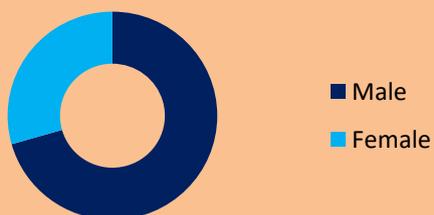
Arunachal Pradesh



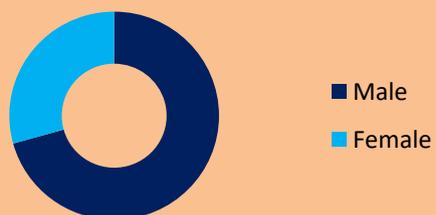
Manipur



Tripura



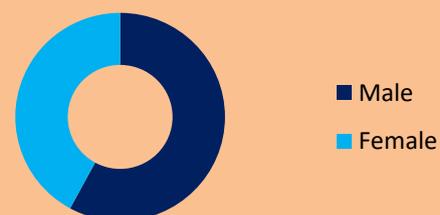
Assam



Nagaland



Meghalaya



MIGRATION

Human migration is the movement of people from one place in the world to another for the purpose of taking up permanent or semipermanent residence, usually across a political boundary. Migration People can either choose to move ("voluntary migration") or be forced to move ("involuntary migration"). Migration occurs at a variety of scales: intercontinental (between continents), intracontinental (between countries on a given continent), and interregional (within countries).

Migration One of the most significant migration patterns has been Rural to Urban migration—the movement of people from the countryside to cities in search of opportunities.

Push-factors Countries of origin	Migrants	Pull-factors Countries of destination
⇒ Population growth, young age structure	Demographic factors and social infrastructure	⇒ Stable population, population decline, demographic ageing
⇒ Inadequate educational institutions, medicare and social security		⇒ Welfare state benefits, educational institutions, medicare, social security
⇒ Unemployment, low wages	Economic factors	⇒ Labour demand, high wages
⇒ Poverty, low consumption and living standard		⇒ Welfare, high consumption and living standard
⇒ Dictatorships, shadow democracy, bad governance, political upheaval	Political factors	⇒ Democracy, rule of law, pluralism, political stability
⇒ Conflict, (civil) war, terrorism, human rights violation, oppression of minorities		⇒ Peace, security, protection of human and civil rights, protection of minorities
⇒ Ecologic disaster, desertification, lack of natural resources, water shortage, soil erosion, lack of environmental policy	Ecological factors	⇒ Better environment, environmental policy, protection of natural resources and environmental protection
⇒ Decisions of the family or the clan	Migrant flows and migrant stocks	⇒ Diaspora, ethnic community
⇒ Information flows, media,		⇒ Information flows, media, transferred picture of

• FACTORS OF MIGRATION

Migration is a **global phenomenon** caused not only by economic factors but many other factors like **social, political, cultural, environmental, health, education** are included under the broader classification of **Push and Pull factors** of migration:

Push Factor: Push factors are those that **compel** a person, due to different reasons, to leave a place of **origin** (out-migration) and migrate to some other place.

Pull Factor: Pull factors indicate the factors which **attract** migrant (in-migration) to an area (destination).

TYPES OF MIGRATION

- *internal migration*: moving within a state, country, or continent
- *external migration*: moving to a different state, country, or continent
- *emigration*: leaving one country to move to another
- *immigration*: moving into a new country
- *return migration*: moving back to where you came from
- *seasonal migration*: moving with each season or in response to labour or climate conditions

VITAL STATISTICS METHOD OF MIGRATION:

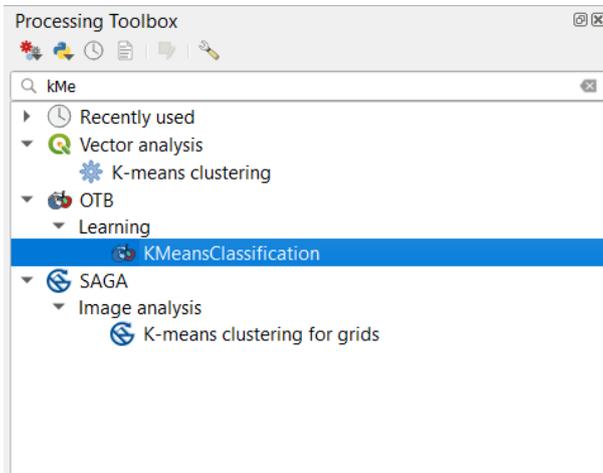
Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put in the following simple form:

$$\text{Net M} = (P_{+n}) - P_{\cdot} - (B - D)$$

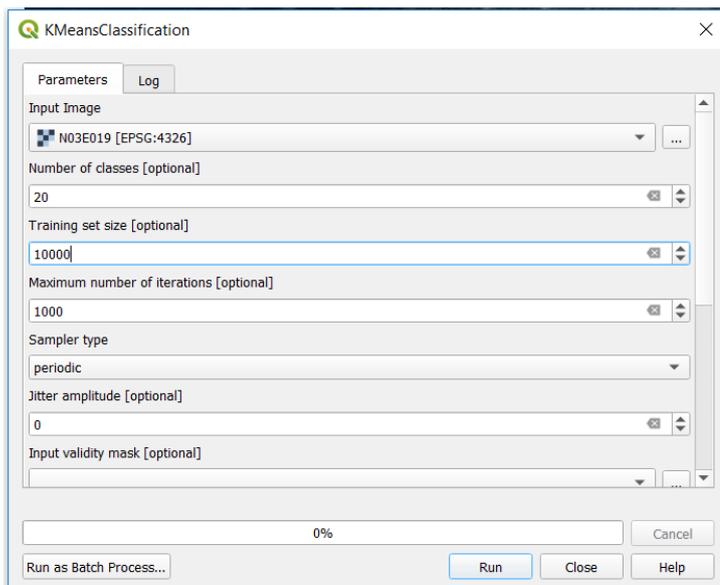
where for any given area Net M = net migration, P_· is the population at the earlier census, P_{+n} is the population at the later census, B is the number of births that occurred to residents of the area during the intercensal period, and D is the number of deaths that occurred to residents.

Land Use Map Using Unsupervised Classification

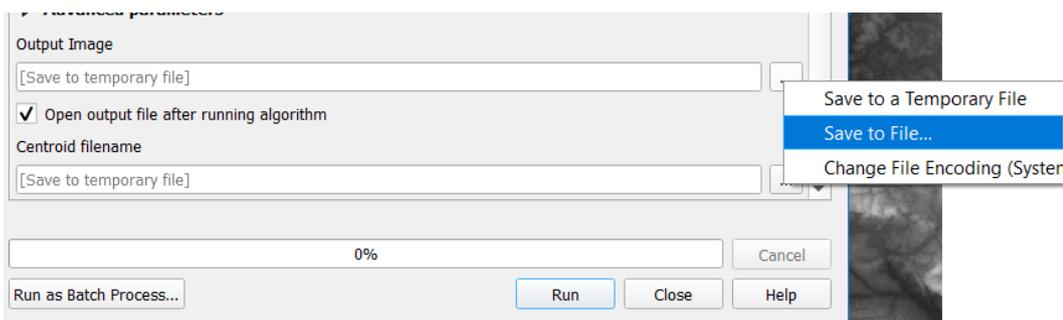
- Add a raster layer in a project **Layer >> Add Layer >> Add Raster Layer**.
- Go to the search box of Processing Toolbox , search **KMeans** and select the **KMeansClassification**.



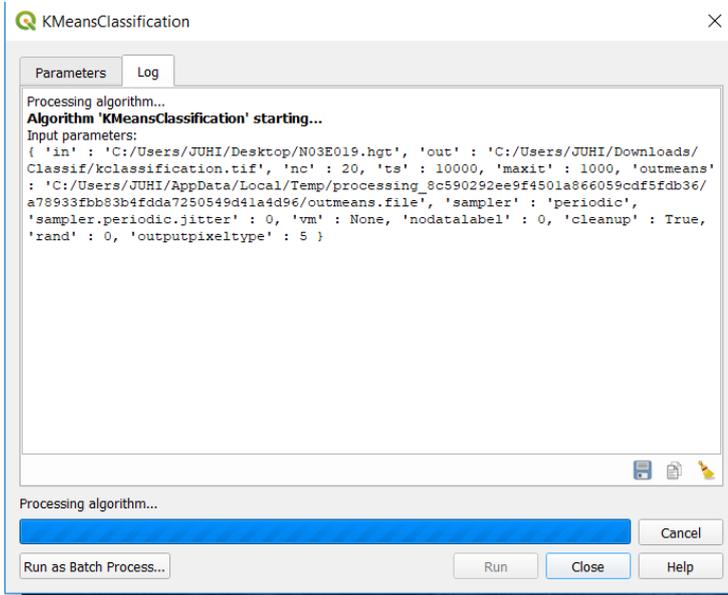
Select the input image. Type the Number of classes to 20 (default classes are 5) Fill training size to 10000



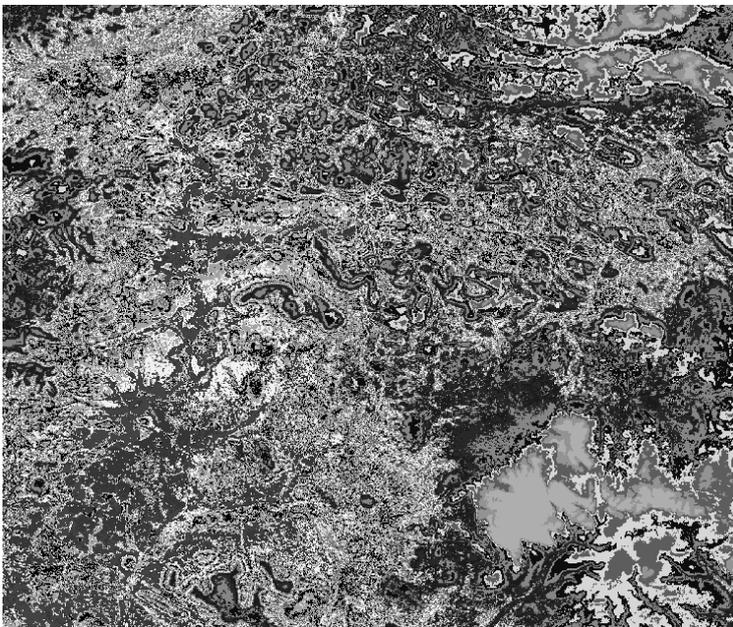
- Type the name of output image save to file.



- And in the last tap on **Run**



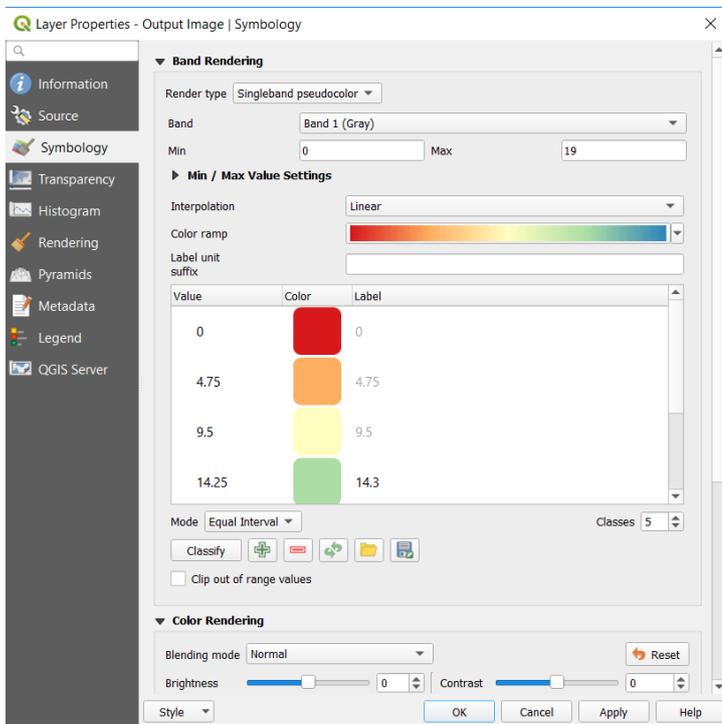
- Output image directly display on canvas. Image is shown below.



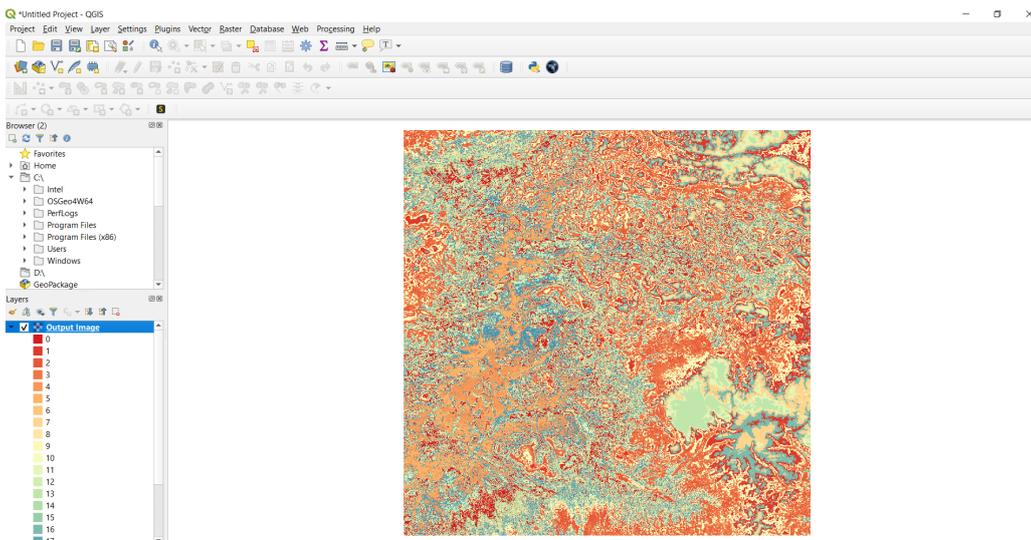
In the layer panel, right click on the output layer and select **Properties >> Symbology**. Change Render Type **Singleband Psuedocolor**.

- Select the **Color Ramp** (we selected spectral)
- Choose Mode **Equal Interval** (default selection is continous)

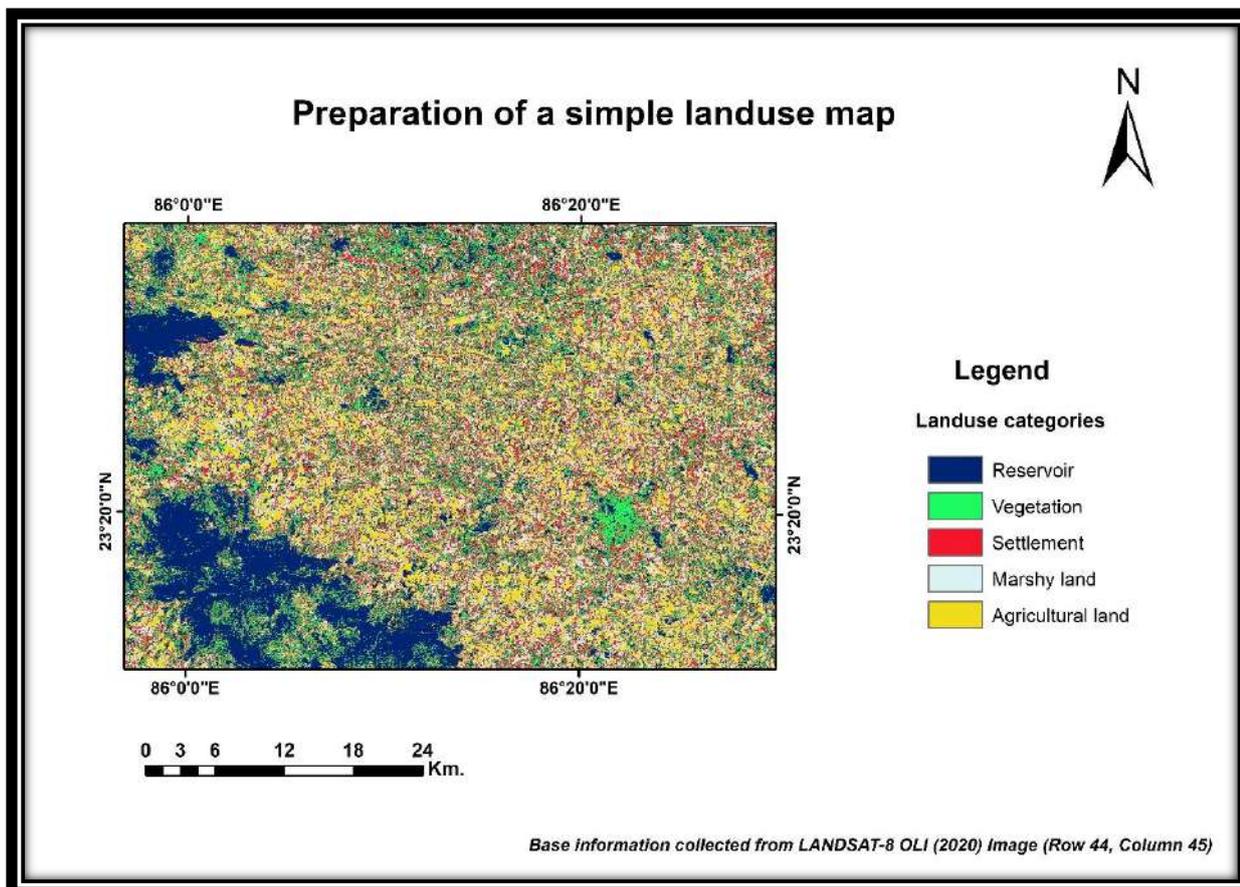
Change the number of **classes** from 5 to **20**.



In the last click on **OK**. Output image is provided below. You can also classify according to discrete interpolation if desired



This is all about unsupervised classification using K Means Classification. If you face any problem in implementing then please do comment.



INTERPRETATION:

The study area is Bankura District, is a region of West Bengal. This region have various of land use and cover features.

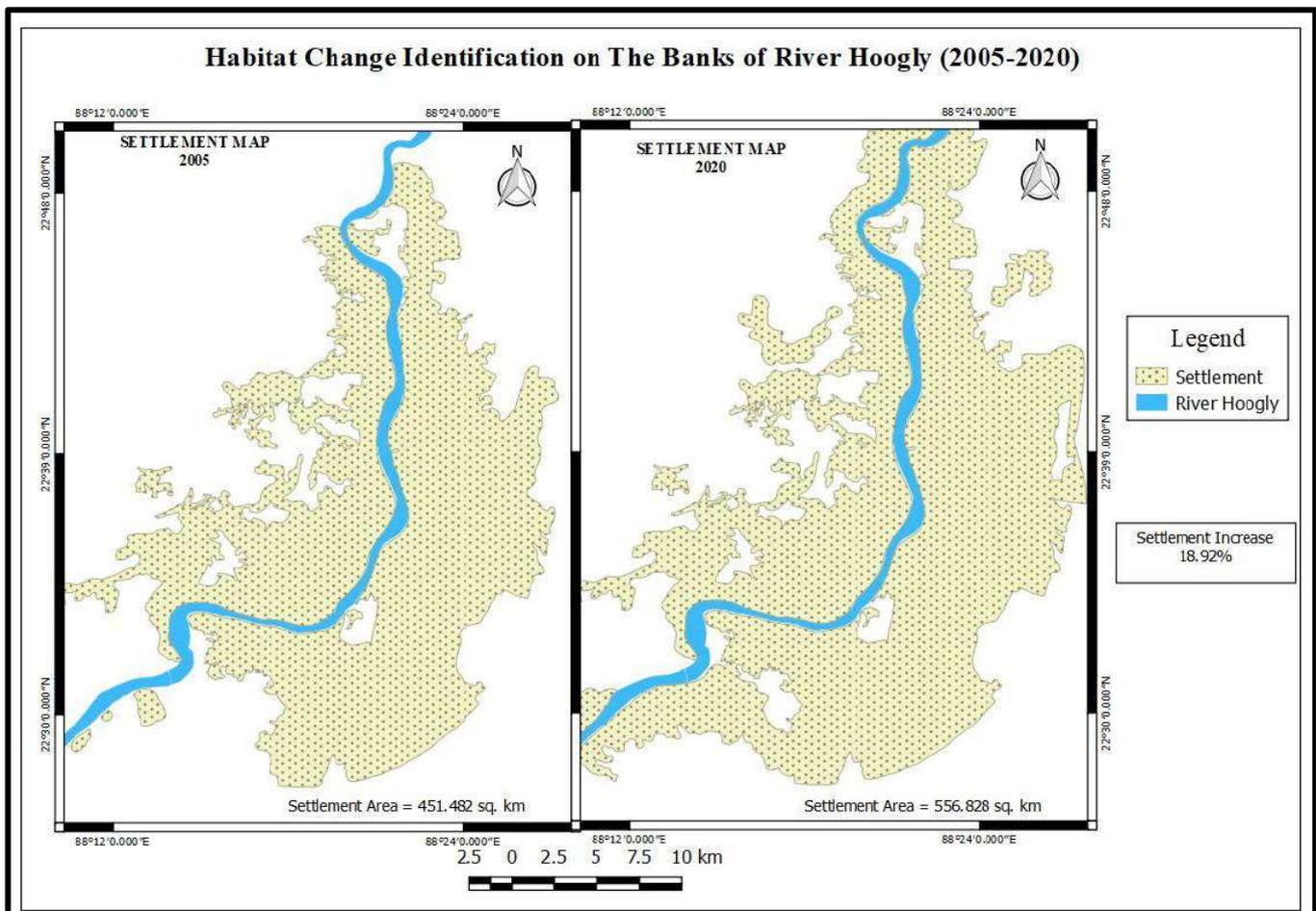
- **Land cover:** It is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground water etc. Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water.
- **Land use:** It not only shows how people use the landscape but also utilization of land resources naturally. Therefore, the land of a particular region can be used for the purpose of infrastructural development, settlements, amusement & recreation, conservation of wildlife and wildlife habitat, agriculture & farming or mixed uses and can be defined as 'land use'. Land use applications involve both baseline mapping and subsequent monitoring, since timely information is required to know what current quantity of land is in what type of use and to identify the land use changes from year to year.
 - **Vegetation:** Deciduous forest is mainly dominated by woody vegetation cover, i.e., >60% along with average plant height more than 2 metre. The floral communities dominated by the trees which hold broadleaves with an inimitable

feature of annual cycle of leaf-on and leaf-off periods means the trees shed their leaves at a particular season of each year, mainly in late winter. Dense forest like Khatra, Ranibandh, Bishnupur, Sonamukhi, Bojora, Gangajal ghati occupies huge areas of the district, Bankura. Currently the land under forest department is approximately 21.5%. About 48% of the forest in this district is degraded type and alarmingly the forest/plant cover is depleting gradually. In addition to ecological utilities, the forests in this district also serve as the basis of livelihood of poor communities of the rural area and the tribes as well. Forests not only provide money but also are important for energy resources in form of fuel and forage for the disadvantaged folks. This type of forest mainly located West, East and South part of the district.

- **Crop land:** Temporarily cropped area followed by harvest and a bare soil period (e.g., single and multiple cropping systems). Different types of crop cultivation and cropping arrangement are specified according to the seasons (e.g., kharif, rabi, zaid). Cropland includes areas are used for the common crop production and are also used for the adapted crops for harvest. Agriculture in Bankura district is dominated by paddy cultivation in kharif season and mustard cultivation in rabi season. A large number of landraces of rice were cultivated by the tribal and rural community of farmers of Bankura district, so far 65 folk rice varieties are produced from Bankura District of West Bengal viz., Dharnagra, Suakalma, Vutmuri, Tulsibhog, Sitasal, Gobindabhog, Rupsal, Kalamkati, Neta, Nagrasal, Danarguri, Chandrakanta, Daharlagra, Badsahabhog, Raghusal, Bhurisal, Khajurchari, Gangajali, Basmati and Kataribhog. Other crops are paddy, wheat, sugarcane, oilseeds etc.,
- **Water Body:** Bankura is drained by three major rivers e.g., Damodar, Darkeswar and Kangsabati along with their tributaries as Gandheswari, Silai and Kumari deserves special consideration. The rivers of the area are flowing from the north-east to the south-west in courses roughly parallel to one another. They are mostly rain-fed, hill streams, originating from hills in the west. The rivers come down in floods after heavy rains and subside as rapidly as they rise. In summer, their sand beds are almost always dry. Damodar river forms the northern boundary of the district along with Bardhaman district for about 72 kilometres and then flows into Bardhaman district. Saliriver which is one of the important tributaries of the Damodar, drains the northern part of the district.
- **Settlement:** Settlement is one of the major land use features. In the study area here almost every place has settlement. Mainly centre to east part of the district are dense population.

- **Upland:** Here I also noticed that the south, middle and west part of the district have some of uplands. Maximum river are generated from this area.

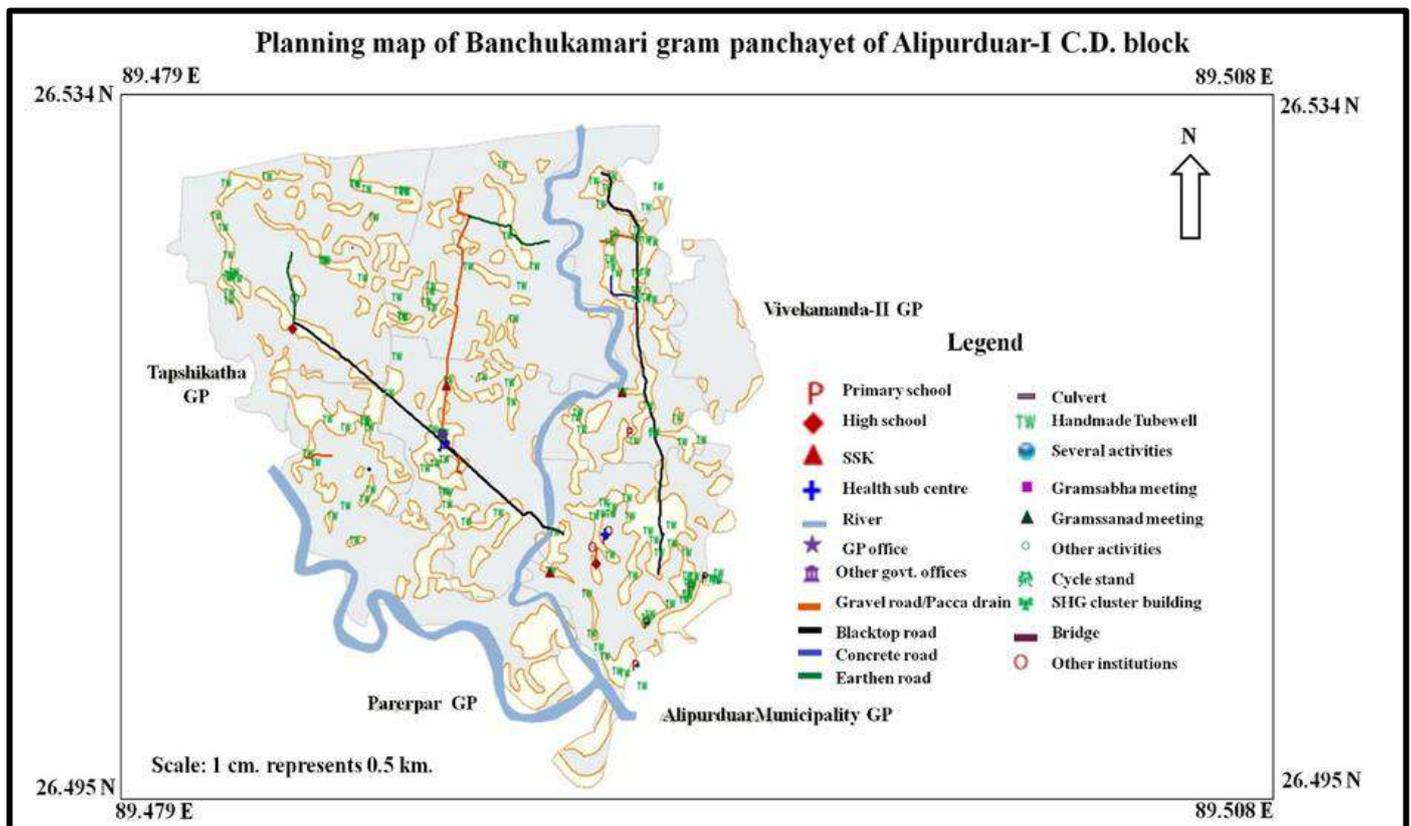
Human Habitation And Detection Of Change From Two Satellite Image Of (2005- 2020)



Interpretation:

Here we can see some changes of settlement on both sides of river Hooghly. According to our calculation settlement increases around 19% from 2005 to 2020. Mainly south part of map settlement increase massively. Where in 2005 the settlement area was only 451.48 sq.km. on 10km buffer of the river it increases in 2020 in 556.83 sq.km.. West part of the river is maximum settlement increase then the left part.

Spatial Plan Formulation and Layout Map of a Gram Panchayat



Step 1- Collect Mouza map from following Gram Panchyat.

Step 2. Then using QGIS Georeference the the Mouza Map and clip the particular the village Boundary.

Step 3. Using GPS survey I collect every impotent place of the village like school, police station, any administrative building etc. it find from gram panchyat by secondary data.

Step4. Plot the places as a point and digitized settlements also Roads using Qgis.

Step 5. At the end prepare a layout map and add legends, north lines, scale and heading of the map.

INTERPRETATION:

Banchukamari is a Village in Alipurduar-i Block in Jalpaiguri District of West Bengal State, India. It belongs to Jalpaiguri Division . It is located 89 KM towards East from District head quarters Jalpaiguri. 4 KM from Alipurduar-I. 530 KM from State capital Kolkata. In this village planning map I put every impotent features. Here we see in village have 2 river one is run west boundary of the village and another is running centre part of the village. I noticed right sight of Centre River have maximum primary school then other side of the river. Also noticed here 2 high school one is west part of village and another is south east part of the village. Handmade tube well is available everywhere in the village. But here only 2 hospital or health centre located in the village. Centre of the village have Gram panchyat and govt. Offices. Here also noticed 2 SSK and one other institution.

BHAIRAB GANGULY COLLEGE

(WEST BENGAL STATE UNIVERSITY)

M.SC Semester IV Examination 2021

PRACTICAL COPY

Name - ALIMPA BISWAS

Roll - BGC / MGF / S IV / 21 No - 327

Registration No - 1071921401417

Semester - IV

Subject - GEOGRAPHY (PG)

Paper code - GEOPDSE04P

Paper - REGIONAL PLANNING & RURAL
DEVELOPMENT PRACTICAL

What is Research: Definition, Methods, Types & Examples

What is Research?

Definition: Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.”

Inductive research methods analyse an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

Characteristics of research

1. Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
2. The analysis is based on logical reasoning and involves both inductive and deductive methods.
3. Real-time data and knowledge is derived from actual observations in natural settings.
4. There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
5. It creates a path for generating new questions. Existing data helps create more research opportunities.
6. It is analytical and uses all the available data so that there is no ambiguity in inference.

What is the purpose of research?

There are three main purposes:

1. **Exploratory:** As the name suggests, researchers conduct exploratory studies to explore a group of questions. The answers and analytics may not offer a conclusion to the perceived problem. It is undertaken to handle new problem areas that haven't been explored before. This exploratory process lays the foundation for more conclusive data collection and analysis.
2. **Descriptive:** It focuses on expanding knowledge on current issues through a process of data collection. Descriptive studies describe the behaviour of a sample population. Only one variable is required to conduct the study. The three primary purposes of descriptive studies are describing, explaining, and validating the findings.
3. **Explanatory:** Causal or explanatory research is conducted to understand the impact of specific changes in existing standard procedures. Running experiments is the most popular form.

Types of research methods and example

Research methods are broadly classified as Qualitative and Quantitative.

Both methods have distinctive properties and data collection methods.

Qualitative methods -Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Types of qualitative methods include:

1. One-to-one Interview
2. Focus Groups
3. Ethnographic studies
4. Text Analysis
5. Case Study

Quantitative methods -Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

Types of quantitative methods include:

1. Survey research
2. Descriptive research
3. Correlational research

8 tips for conducting accurate research

1. Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.
2. Keep track of the frequency with which each of the main findings appears.
3. Make a list of your findings from the most common to the least common.
4. Evaluate a list of the strengths, weaknesses, opportunities, and threats that have been identified in a SWOT analysis.
5. Prepare conclusions and recommendations about your study.
6. Act on your strategies
7. Look for gaps in the information, and consider doing additional inquiry if necessary
8. Plan to review the results and consider efficient methods to analyse and dissect results for interpretation.

Literature search on research problem stated

Literature review-

A **literature review** is an overview of the previously published works on a specific topic. The term can refer to a full scholarly paper or a **section** of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

Producing a literature review is often a part of graduate and post-graduate student work, including in the preparation of a thesis, dissertation, or a journal article.

Why write a literature review?

When you write a thesis, dissertation, or research paper, you will have to conduct a literature review to situate your research within existing knowledge. The literature review gives you a chance to:

- Demonstrate your familiarity with the topic and scholarly context
- Develop a theoretical framework and methodology for your research
- Position yourself in relation to other researchers and theorists
- Show how your research addresses a gap or contributes to a debate

You might also have to write a literature review as a stand-alone assignment. In this case, the purpose is to evaluate the current state of research and demonstrate your knowledge of scholarly debates around a topic.

The content will look slightly different in each case, but the process of conducting a literature review follows the same steps.

There are five key steps:

1. **Search** for relevant literature
2. **Evaluate** sources
3. **Identify** themes, debates and gaps
4. **Outline** the structure
5. **Write** your literature review

A good literature review doesn't just summarize sources—it analyses, synthesizes, and critically evaluates to give a clear picture of the state of knowledge on the subject.

What is a research gap?

Let us begin with understanding what a research gap means. When you read papers or books on topics of your interest, you may realize there are some areas that have significant scope for more research but they have not been tapped by other researchers. In other words, no one has picked up or worked on these ideas. A research gap or a literature gap refers to such unexplored or underexplored areas that have scope for further research.

Here are 6 tips to identify research gaps:

1. Look for inspiration in published literature

- Read books and articles on the topics that you like the most. This will not only help you understand the depth of work done by researchers in your field but also provide an opportunity to ask questions that can lead you to a research gap.

- While reading research articles, you can focus on the Introduction section where the authors explain the importance of their research topic and the gaps they have identified and attempted to fill through their research. Also, look at the directions or suggestions for further research that the authors have made as that could be highly inspiring.
- Read meta-analyses and review papers to learn more about the developments and trends in research over the years in the area of your liking. This will help you get acquainted with the problems that have been researched upon in the past as well as trending queries on those topics that you find interesting.

2. Seek help from your research advisor

- Discuss the issues and problems in your field with your research advisor to generate ideas for research. Articulating your ideas and knowing what others think and are working on may help you identify your study area or even identify mistakes in your approach. If you think a question would be interesting to work on, you can discuss it with your advisor and get their suggestions.

3. Use digital tools to seek out popular topics or most cited research papers

- To familiarize yourself with the trending queries in your field, you can use digital tools as they can save time and help you cast a wider net in your search for a research gap. Websites like Essential Science Indicator that identify the most cited papers in a field along with the emerging branches, influential contributors, publications, and countries in that field can be immensely useful to know which topics are considered important. You can also use Google Trends to learn more about the popular questions related to your research area. This will ease your search for an untapped area in your research field.

4. Check the websites of influential journals

- The websites of prominent journals often have a section called ‘key concepts’ where experts in an area highlight the central ideas in that field. Reading through this section can help you gain a lot of insights and generate new ideas as well. Moreover, you should also look through the reference section of these papers as it can lead you to important resources on the topic.

5. Make a note of your queries

- It is a good practice to note all the questions that cross your mind while reading any published literature. If possible, you should map the question to the resource it is based on. "Keep track of what the authors told you and the questions that occur to you whenever you read anything - an article, a book, a book chapter, a dissertation, etc." advises Nadine Anderson, Behavioural Sciences and Women's and Gender Studies Librarian at the University of Michigan. She says that this will also help in ensuring that there is no unintended plagiarism in your research paper. You can use tables, charts, pictures, or tools to maintain a record. This can help you in the long run when you are developing your idea into a research problem or even when writing your manuscript.

6. Research each question

- Once you have a list of questions that could be explored, you must conduct thorough research on them. What does this mean? Read more about each doubt or query that you have. Find out if other researchers have had similar questions and whether they have found answers to them. This will help you avoid duplication of work.

What is Research problem?

A research problem is a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. In some social science disciplines the research problem is typically posed in the form of a question. A research problem does not state how to do something, offer a vague or broad proposition, or present a value question.

The purpose of a problem statement is to:

Introduce the reader to the importance of the topic being studied. The reader is oriented to the significance of the study and the research questions or hypotheses to follow.

Places the problem into a particular context that defines the parameters of what is to be investigated.

Provides the framework for reporting the results and indicates what is probably necessary to conduct the study and explain how the findings will present this information.

How to identify a research problem?

After choosing a specific topic for your academic paper, you need to state it as a clear research problem that identifies all the issues that you'll address. It's not always simple for students to formulate it. In some fields, they may end up spending a lot of time thinking, exploring, and studying before getting a clear idea of what research questions to answer.

Some research paper topics are too broad to give a researchable issue. For example, if you decide to study certain social issues, like child poverty, remember that they don't provide any researchable question. These are very broad to address and take a lot of time and resources to become unfeasible so that your study will lack enough focus and depth.

After doing this 3 steps, we can do our research.

Framing research questions and hypothesis

Research questions-

Research question is 'a question that a research project sets out to answer'. Choosing a research question is an essential element of both quantitative and qualitative research. Good research questions seek to improve knowledge on an important topic, and are usually narrow and specific.

How to frame a hypothesis from research question?

A hypothesis by definition is a proposition or a number of propositions that reflect a prediction. In simpler words, a hypothesis is a statement that assumes a relationship between an independent variable and a dependent variable. In research, hypotheses provide the basis for data collection and data analysis. The data analysis is essentially applications of research tools and techniques to prove or disprove the hypothesis. However, before testing, it is important to frame the hypotheses properly. This sometimes poses a challenge.

Need for framing a hypothesis from research questions

Not all types of research require a hypothesis. The need for framing a hypothesis stems from the research questions and the research methodology. It depends on the research approach, research type, and research method. Framing a hypothesis is essential in cases:

When the research type was descriptive-

Descriptive research is the one that aims to collect information and analyse it statistically to draw conclusions. For example, let a primary study want to investigate the effects of organizational factors on job satisfaction of employees. Moreover, several organizational factors identified in the literature review are: remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and, scope of promotion. The hypothesis, in this case, will test the effect of these factors on job satisfaction of employees.

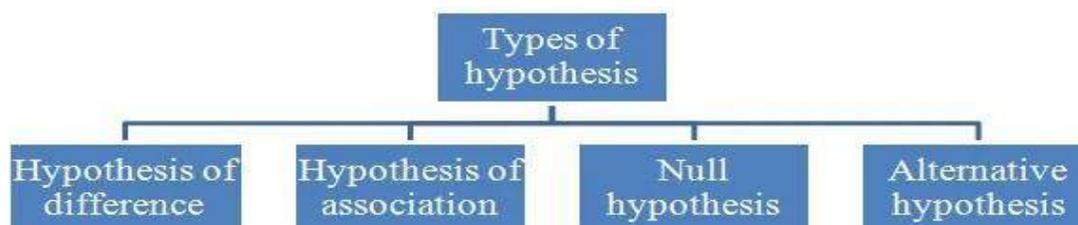
When the research approach is deductive-

A deductive approach of research emphasizes causality and aims to test a theory with the help of a hypothesis. Suppose one wants to examine the Economic theory of export-led growth. This theory states that a country can achieve an accelerated rate of growth by relying on the expansion of exports. There are several factors such as foreign direct investment (FDI), trade openness, exchange rate, bilateral and multilateral trade agreements among others that the literature identifies as related to export expansion. In this case, the hypothesis will be framed to determine the effects of these factors on the growth rate.

When the research method is quantitative-

A quantitative research method is the one that is based on the measurement of variables. It is useful to assess the effect of GDP and the current account deficit of a country on its fiscal deficit. GDP, current account deficit and fiscal deficit all are measured and published in monetary units. The hypothesis, in this case, will be framed to measure the effect of GDP and CAD on the fiscal deficit.

Types of hypothesis -



A hypothesis can be stated in a number of ways. Consider the example research on student performance (grades) in relation to counselling. These are the types of hypotheses that depend on the objective of the study.

- **The hypothesis of difference.** There is a significant difference between the average performance of students who receive counselling and those who do not.

- The hypothesis of association. There are equal numbers of students in the classroom who receive counselling and who do not receive counselling.
- **Null hypothesis.** There is no relationship between counselling and the grades received by students in the classroom.
- **Alternative hypothesis.** There is a significant relationship between counselling and the grades received by students in the classroom.

Furthermore, if the research predicts that there is a significant relationship between counselling and student performance. The alternative hypothesis reflects this prediction. The null hypothesis is framed in such a way that it can be refuted to confirm the alternative hypothesis.

Format of a hypothesis

Consider the example of organizational factors and job satisfaction mentioned above.

- Make a flow chart before framing the hypotheses. This is called a conceptual framework and it helps in framing the hypotheses in a systematic way. In the conceptual framework, list the independent variables or the factors on the left-hand side. The dependent variable 'job satisfaction' should be on the right-hand side. Use an arrow in between. The directionality of the arrow should be from the independent variables to the dependent variable.
- Following the conceptual framework, the independent variables should come on the left-hand side of the hypothesis. The dependent variable should be on the right-hand side of the hypothesis.
- Include words like 'impact', 'influence', 'effect', 'relationship' or 'association' within the hypothesis. This is to indicate what tests can be used in testing it.
- Use notation H_0 to denote the null hypothesis.
- Use notation H_A to denote the alternative hypothesis.

Following the above rules, the null and the alternative hypotheses in case of the above example are:

H_0 : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have no effect on the job satisfaction of employees.

H_A: Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have a significant effect on the job satisfaction of employees.

Steps for constructing a hypothesis

- The first step before constructing a hypothesis is a thorough review of existing literature on the topic of research.
- After the literature review, identify gaps in the literature. Then narrow down the research problem to fulfill the gap.
- The research problem needs to be stated in terms of research objectives or research questions.
- Following the research question, identify the dependent and the independent variables.
- Frame statements or hypotheses that reflect a prediction and are testable.
- The results of hypothesis testing directly help to answer the research questions and draw conclusions for the study.

Important points

While framing hypotheses, these are the important points one needs to remember.

- The hypothesis should be precise and clear.
- It should be stated in simple terms.
- The hypothesis should propose a relationship between two variables or a set of variables namely dependent and independent variables.
- The scope of the hypothesis should be specific and narrow.
- The hypothesis should conform to the research questions.
- It should be consistent with the findings of the previous researches or facts that are known and established.
- The hypothesis should be testable with primary or secondary data.
- The results of hypothesis testing should address the study's aim and objectives adequately.

Selecting study area and target population

Selecting study area-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work” deally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

Target populations-

Before research can begin the target population must be identified and agreed upon. The target population is the entire population, or group, that a researcher is interested in researching and analysing. A sampling frame is then drawn from this target population. For example, if the research was to identify approximately how many parents read a particular article in their child’s school newsletter, the target population would be all parents of children at that school. The target units would then be the individual parents, and the school could provide a list of parent contact details which would serve as a sampling frame.

Identifying and collecting relevant secondary data

Secondary Data- Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

Data classified as secondary for particular research may be said to be primary for another research. This is the case when data is being reused, making it primary data for the first research and secondary data for the second research it is being used for.

Steps of collecting secondary data-

1. **Termine your research question** – As indicated above, knowing exactly what you are looking for
2. **Locating data**– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.

3. **Evaluating relevance of the data** – Considering things like the data's original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. **Assessing credibility of the data** – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.
5. **Analysis** – This will generally involve a range of statistical processes as discussed in Chapter 13.

Survey schedule and questionnaire

- The research process is incomplete without the collection of data, which starts after the identification of the research problems and chalking out research design.
- There are several methods involved in the collection of primary data, like observation, interviews, questionnaires, schedules, etc.
- Both questionnaire and schedule are popularly used methods of collecting data in research surveys.
- There is much resemblance in the nature of these two methods and this fact has made many people to remark that from a practical point of view, the two methods can be taken to be the same.
- But from the technical point of view, there are many differences between the two common methods of data collection.

Similarities between survey and questionnaire-

- Both are set of related items having questions relating to a central problem.
- Both use mainly structured questions and these questions are so phased and interlocked that they have a built-in mechanism for testing the reliability and validity of the response.
- In both the same set of questions is administered to all the respondents and comparable results are obtained.
- Both these instruments have to be used with the same general principles of designs and have to take into account the same problems and basic difficulties they have to be limited in length.
- In both, the central problem has to be concentrated upon the following considerations involved in the problem of evolving the questionnaire and a schedule as a unit.
- Drawing the respondent into a situation through awake and interest.
- Proceeding from simple to complex questions.
- No early and sudden request for information of a personal and embracing intimate nature.
- Not asking embarrassing questions without giving the respondent an opportunity to explain himself.
- Moving smoothly from one item to another.
- In both certain types of questions have to be eliminated such as vague and ambiguous questions, emotionally charged questions, loaded and leading questions, questions

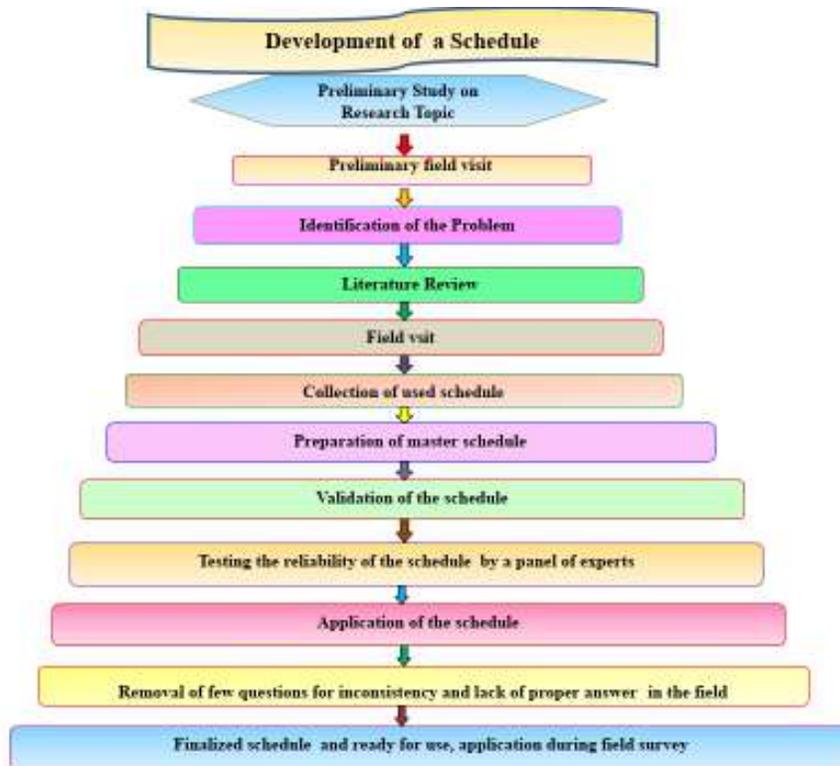
eliciting no response and questions having a structured response to the queries, violence to the existing facts.

- In both pilot studies and pre-tests are necessary for formulating the instrument and for bringing them to the final form. They have to go through the same stages of development.

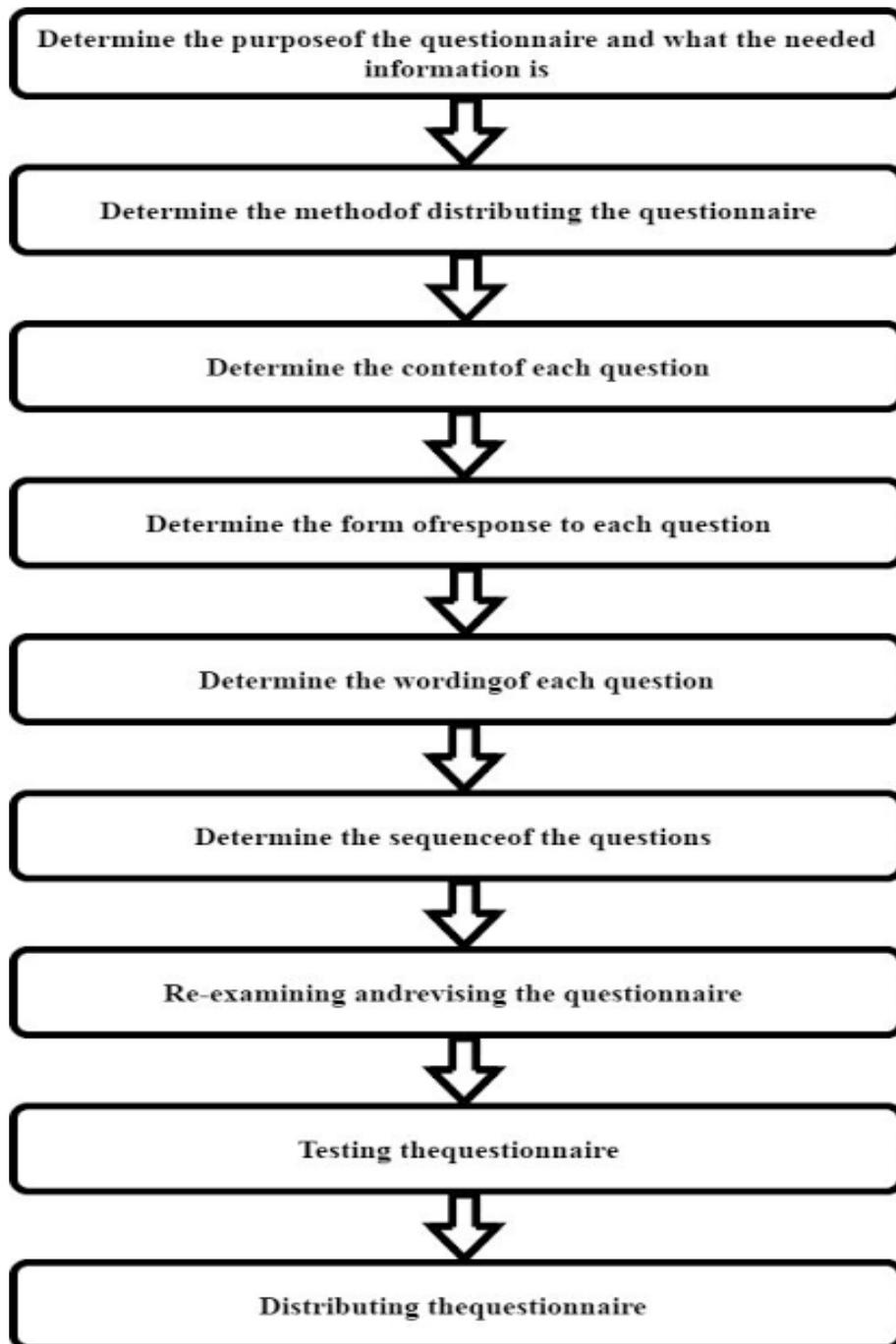
Differences between survey schedule and questionnaire -

- The questionnaire refers to a technique of data collection which consists of a series of written questions along with alternative answers.
- The schedule is a formalized set of questions, statements, and spaces for answers, provided to the enumerators who ask questions to the respondents and note down the answers.
- While a questionnaire is filled by the informants themselves, enumerators fill the schedule on behalf of the respondent.

Prepare a schedule-



Prepare a questionnaire-



ISSUES ON FIELD RESEARCH

PILOT STUDY BASED ON QUESTIONNAIRE

Definition: A pilot study is a preliminary small-scale study that researchers conduct in order to help them decide how best to conduct a large-scale research project. Using a pilot study, a researcher can identify or refine a research question, figure out what methods are best for pursuing it, and estimate how much time and resources will be necessary to complete the larger version, among other things.

Process of Piloting a Survey Questionnaire

- **Selecting the pilot sample:** For large or complex surveys, it is a good idea to do a full pilot before starting actual data collection. To do a pilot a researcher need to test all the survey steps from start to finish with a reasonably large sample. The size of the pilot sample depends on how big the actual sample of the researcher is, and how many data collectors the researcher has. For a typical baseline or endline survey a sample of around 30-50 people is usually enough to identify any major bugs in the system.
- **Implementation of all the steps from start to finish:** The researcher will start by training his data collectors, if he has them. Then the researcher will distribute and collect the survey, after which he will enter the completed surveys into the database that he has planned to use and will test the analysis that he has planned to perform.
- **Making improvements:** Assuming that the survey was pretested, piloting will normally identify practical problems with implementation, rather than problems with the survey design. For example, lack of staff training, challenges with the logistics of distributing and collecting the survey, or errors in data entry. These can then be fixed before the researcher do the actual survey.

Advantages of Conducting a Pilot Study:

Pilot studies are useful for a number of reasons, including:

- Identifying or refining a research question or set of questions
- Identifying or refining a hypothesis or set of hypotheses
- Identifying and evaluating a sample population, research field site, or data set
- Testing research instruments like survey questionnaires, interview, discussion guides, or statistical formulas
- Evaluating and deciding upon research methods
- Identifying and resolving as many potential problems or issues as possible
- Estimating the time and costs required for the project
- Gauging whether the research goals and design are realistic
- Producing preliminary results that can help secure funding and other forms of institutional investment

After conducting a pilot study and taking the steps listed above, a researcher will know what to do in order to proceed in a way that will make the study a success.

ETHNOGRAPHIC FIELD DIARY

Ethnographic data is collected in a variety of ways that involve the researcher being embedded in the field in a variety of ways. Ethnographers collect data by observing in the field. This includes both structured and unstructured observations, along with participant observations. In addition, ethnographers engage in formal and informal interviews and focus groups with subjects. Often researchers will engage in a variety of methods for one research project and this data collection will occur over a period of time. An ethnographer may spend days, months or even year in one **field site** to observe an interview research subject. A field site is the location on the environment an ethnographer is studying. It can be virtually any place- a school, workplace, community, home, street and even in the online world. This **triangulation** of ethnographic methods- using a variety of methods in a field site--- help the researcher to gather as much data as possible to identify trend, patterns and nuances of the field they are studying.

As a result of the intensive data collection method that ethnographers engage, researchers often end up with a good deal of data to analyze. It is therefore important for ethnographers to have a plan on exactly they will collect their data before they head into the field.

LONGITUDINAL STUDY

Definition: A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

Working procedure of Longitudinal Study:

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

. Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Benefits of Longitudinal Study:

A longitudinal study can provide unique insight that might not be possible any other way. This method allows researchers to look at changes over time. Because of this, longitudinal methods are particularly useful when studying development and lifespan issues. Researchers can look at how certain things may change at different points in life and explore some of the reasons why these developmental shifts take place.¹For example, consider longitudinal studies that looked at how identical twins reared together versus those reared apart differ on a variety of variables. Researchers tracked participants from childhood into adulthood to look at how growing up in a different environment influences things such as personality and achievement. Since the participants share the same genetics, it is assumed that any differences are due to environmental factors. Researchers can then look at what the participants have in common versus where they differ to see which characteristics are more strongly influenced by either genetics or experience

Drawbacks of Longitudinal Study:

- **Longitudinal Studies Can Be Expensive:** Longitudinal studies require enormous amounts of time and are often quite expensive. Because of this, these studies often have only a small group of subjects, which makes it difficult to apply the results to a larger population.
- **Participants Tend to Drop out over Time:** Another problem is that participants sometimes drop out of the study, shrinking the sample size and decreasing the amount of data collected. This tendency is known as selective attrition. Participants might drop out for a number of reasons, like moving away from the area, illness, or simply losing the motivation to participate. In some cases, this can influence the results of the longitudinal study. If the final group no longer reflects the original representative sample, attrition can threaten the validity of the experiment. Validity refers to whether or not a test or experiment accurately measures what it claims to measure. If the final group of participants is not a representative sample, it is difficult to generalize the results to the rest of the population.

CASE STUDY RESEARCH

Definition: Case study research is that in which the subject of the research is studied within its social, political, organizational, or economic context and it is one of the commonest approaches across the social and management sciences.

Many authors cite Yin, who describes case study research as:

“... an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2009, location no. 638-650).

In other words, the subject of the research is comprehensively studied as an example of a real live phenomenon, within the context in which it happens.

How & when is the Case Study method used?

According to Yin (2006), case study research is best applied when the research addresses descriptive or explanatory questions: i.e. what happened, how, and why?

It is also good for describing a situation or phenomenon occurring in the present, where in-depth description is useful and where the researcher does not need to manipulate events.

Yin (2003) identifies three types of case studies:

1. Exploratory: the case study is used to define questions and hypotheses – or to test out a research procedure – for a further piece of research, such as a large-scale survey.
2. Descriptive: the case study is used to describe a particular phenomenon within its context. It can be used to expand on a particular theme unearthed by a survey.
3. Explanatory: the case study explores cause-effect relationships, and/or how events happen.

Only the third of these approaches can stand up as a method in its own right, and not as an ancillary to other quantitative approaches such as surveys or field experiments.

Advantages of the Case Study as a Research Method

- a) Case studies are "real" – they offer a chance to get a snapshot of real life: a rich and thick picture. As such, they are most appropriate for dealing with a subject that is context dependent, complex, unusual, or where there is some ambiguity.
- b) In direct contrast to positivist approaches, which seek to generalise, the case study offers particularity: i.e. the opportunity for a holistic approach without the distraction of too many variables (Gambeson, 2007).
- c) While it offers depth and specificity, case study research also offers breadth and diversity in terms of methods of data collection and analytical techniques. For example, one case study can incorporate surveys, interviews, direct observation, and archival research. This offers the possibility of several different layers of analysis which can reveal several different perspectives, with the added benefit of triangulation of the results.
- d) According to Woodside (2010, pp. 2-3) the usefulness of case study research lies in the fact that it encourages research methods that help measure thinking over an ongoing period, for example by multiple interviews.

- e) It can also be a useful method when the unit of analysis, or the subject under consideration, is a collective entity such as an organisation or a community.

Disadvantages of the Case Study as a Research Method

- a) The most common objection to case study research is that it is insufficiently rigorous. Quite often this criticism relates not to the method as such, but to the way case studies are presented: the author does not leave a clear audit trail detailing his or her research and explaining the conclusions.
- b) Case studies are often seen as a "bolt-on" to a major research project, defining research questions or throwing further light on an issue that has been revealed by a survey. That explanatory research can offer an understanding of a phenomenon is viewed with scepticism by some, on the grounds that a single case study cannot yield a sufficient volume of evidence on which to generalise.

ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

In order to act on the data collection, a researcher will most likely have to engage with his student population and other stakeholders. When approaching students with data collection requests it is important to be aware of certain ethical considerations.

Ethical considerations refer to the ethical practices of how data is collected, stored or shared. These can include securing clear and informed consent, how to safely store data or how to secure permissions to use or share data. Here are some common ethical considerations that a researcher needs to think through before collecting his data:

Informed Consent: Informed consent refers to written consent by a person to participate in any given evaluation activity where private data and information may be collected. A document is typically prepared that outlines the goals of the evaluation, why data is being collected from whom and how, how it will be stored, for how long and who will have access to it. Facilitators or data collectors are required to ensure that participants understand this information and provide informed consent.

Confidentiality and Anonymity: Confidential data refers to information that is connected to a particular individual but kept confidential such as medical or service records. Anonymous data is information that cannot be traced to a particular individual. Both kinds of data may prove useful, but it is important to ensure that participants know if and how the information they provide is either confidential or anonymous.

Clear Communication and Data Sharing: While it is important to have clear processes for collecting data, it is equally important to have clear processes for sharing data. This is especially true when individual data is private and sensitive such as mental health or addiction related information. It is useful to let participants know that any information gathered is aggregated in the analysis process as a way of ensuring privacy of individual data.

PARTICIPATORY RURAL APPRAISAL

Definition

Participatory rural appraisal (PRA) Or participatory learning and action (PLA) is the Fieldworker's use of participatory approach. The PRA continues to evolve so fast that no Definitions can be final and has to be updated several times. PRA is defined and updated Several times by Prof. Robert Chambers. PRA has been described as

And analyses the realities of their lives and condition, and themselves to plan, Monitor and evaluate their actions (chambers, 1994).
empower people to share, analyses and enhance their knowledge of life and Conditions, and to plan, act, monitor, evaluate and reflect (Chambers, 2004).

PRA is a flexible, low cost and time saving set of approaches and methods used to enable Workers to collect and analyze information in terms of past, present and future situations To understand the rural populace and the condition that exists in rural areas which would Provide a thorough and comprehensive idea regarding problems, potentials, resources and Solutions to formulate realistic development practitioners to achieve the desired goals Within specific time (Chambers1992). Participatory approaches like PRA are now Becoming a basic approach in rural development and a wide range of examples can be found in the literature for natural resources and communally owned land: resource economics (Pretty and Scoones 1989), resource planning (Scoones and McCracken 1989), and community forestry (Molnar 1989 and Messerschmitt 1991). The use of the PRA also brought forth the adaptability of PRA tools and their use in the research process (Szymanski, et.al 1997). Locally, participatory processes create the possibility for Creating linkages between survival strategies, knowledge systems, knowledge network And sustainable livelihoods (Gupta, 1997).

The PLA/PRA approach is used with the following assumptions:

1. Rural communities form active foundation for rural development
2. Communities need committed local leaders to stir up their development
3. Communities have knowledge and information but it needs to be organized
4. Communities have resources but they need to be mobilized. They can introduce projects, acting primarily on their own resources.
5. Community organizations are among the many, which are underutilized resources available for development efforts.
6. External units such as Government technical experts and extension workers, NGOs, and international organizations often can provide substantial technical, financial or managerial assistance that is critical to rural communities.
7. Thus, PLA/PRA brings together on the one hand, development needs defined by the community members and on the other, skills of Government, donor agencies and NGOs. It

integrates traditional knowledge systems and external technical knowledge in the development process.

PRA helps communities to:

- Mobilize their human and natural resources
- Define problems
- Consider previous successes and failures
 - Evaluate priorities and opportunities
 - Prepare a systematic and site specific plan of action (CPA)

The objectives of the PRA

The content included in the PRA are simple and do not require high caliber or mathematical thinking. But require minds which are prepared to accept a new way of learning, a new of doing things and that we have limited knowledge of something. The ultimate aim of PLA/PRA workshop is:

1. To build up a permanent “people first” attitudes in the minds of the participants. To show that “people are capable agents to change their own lives” but require limited out side assistance.
2. To establish a notion of “respect” to the people’s knowledge in the life of professionals and their institutions.
3. To provide simple analytical tools to analyze rural situations.
4. To show some of the analytical tools to the community in the field setting and understand their suitability to farmer situation.
5. To enhance participant’s ability to plan with the community.

PRA TECHNIQUES AND METHODS

The most common methods are the following:

Diagramming, Mapping and Modeling: - transects - maps (resource, social, farm)

Venn diagrams - seasonally analysis - historical analysis (time lines, trend lines, activity profiles)

Ranking and scoring - pair wise ranking - matrix ranking - matrix scoring - well-being analysis and wealth ranking - proportional piling –

pie charts (injure charts) Problem analysis - identification and specification - causal chaining - prioritization

Maps and Models – Diagrams

APPLICATION AND USES OF PRA

The PRA is not purely a new method, but is an adoption and development of various other methods/approaches that were developed before it, such as:

1. Andragogy of Education

A well-known expert in education from Brazil, Paulo Freire (1971), gave plenty of critics on the education system that was not participative and did not empower the students. He criticized the conventional education and counselling ways—by referring to it as domestication—as a form of imperialism in the education system. This philosophy of participative education in the system of education and counselling is adopted by the PRA method.

2. The Field of Research and Science

According to Robert Chambers (1992) there are five main trends that decorate the principle method of PRA:

a) **Participatory Action Research**, born from the suggestion of Paulo Freire, stating that the poor can and have the possibility to analyse their own facts and conditions. Recognition of the ability of the village community in analysing their problems is adopted into PRA;

b) **Agro-ecosystem Analysis**, is a combination between system analysis with ownership system by analysing space, time and the cause-effect relation, relative values and decision making. The methods that were adopted into PRA from this method ini is the transek technique (locational trace), mapping, seasonal calendar, Venn diagram (inter-party relations) and ranking matrix;

c) **Applied Anthropology**, created as an effect of the critics to the science of pure anthropology that emphasize more on the comprehension of the community. Applied Anthropology is intended to judge the ability and validity of village community knowledge and to differ between the soul-frame of the outsider with the insider. What PRA adopts from applied anthropology is that studying outside in the fields is a flexible are and not a science that is rigid, the difference between emic (community norms) and ethic (scientific norms), the validity of indigenou technical knowledge of the village community;

d) **Field Research on Farming System**, the focus of attention is in field research participation, because the farmers as the main actors in agriculture are very experienced people that have their own ways to maintain the lives of their agricultural system. This method contributes to PRA its yard/garden sketching technique;

e) **Rapid Rural Appraisal/PRA**, developed because of a number of reasons. The first being the increase of disappointment against anti-poverty bias as the result of “village development tourism”. The bias referred to are: spatial bias (people only come to visit villages that are still close to the city, the main roads and village centre, and ignore the borderline villages);

project bias (only provide attention and support for villages that are in a project's area); personnel bias (favours men better than women, the elite than the poor, the service users than the non-users, etc.); seasonal bias (preference to visit the villages during the dry season or during harvest time compared to the wet season or time of famine); diplomatic bias (people from the outside do not wish to meet poor people or see appalling conditions that can touch their hearts). All those biases can combine to conceal the worst poverty of all. The second reason is the disappointment of conventional survey methods. For years and in many places, experience has shown that surveys using questionnaire tend to be over-rated, boring and confusing. The data received are often inaccurate. It also takes a long time to report, is boring and difficult to use, which in the end is often abandoned. The third reason is there has been efforts to find a new and better method that is more effective, by empowering the indigenous technical knowledge of the village community as a source of information to analyse and use for the experts from outside.

FOCUS GROUP DISCUSSION

Definition

A focus group discussion involves **gathering people from similar backgrounds or experiences** together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group.

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.
- Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not dominate it, and so that those participants who tend not to be highly verbal are able to share their views.

- Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

POST FIELD TECHNIQUES: METHODS OF REPORT WRITING

The purpose of a field report in the social sciences is to describe the observation of people, places, and/or events and to analyze that observation data in order to identify and categorize common themes in relation to the research problem underpinning the study. The content represents the researcher's interpretation of meaning found in data that has been gathered during one or more observational events.

How to Begin

Field reports are most often assigned in disciplines of the applied social sciences. It is important to build a bridge of relevancy between the theoretical concepts learned in the classroom and the practice of actually doing the work you are being taught to do. Field reports are also common in certain science disciplines but these reports are organized differently and serve a different purpose than what is described below.

Professors will assign a field report with the intention of improving your understanding of key theoretical concepts by applying methods of careful and structured observation of, and reflection about, people, places, or phenomena existing in their natural settings. Field reports facilitate the development of data collection techniques and observation skills and they help you to understand how theory applies to real world situations. Field reports are also an opportunity to obtain evidence through methods of observing professional practice that contribute to or challenge existing theories.

We are all observers of people, their interactions, places, and events; however, your responsibility when writing a field report is to conduct research based on data generated by the act of designing a specific study, deliberate observation, synthesis of key findings, and interpretation of their meaning.

THINGS NEED FOR REPORT WRITING:

- **Systematically observe and accurately record the varying aspects of a situation.** Always approach field study with a detailed protocol about what you will observe, where you should conduct your observations, and the method by which you will collect and record your data.
- **Continuously analyze of observations.** Always look for the meaning underlying the actions you observe. Ask yourself: What's going on here? What does this observed activity mean? What else does this relate to? Note that this is an on-going process of reflection and analysis taking place for the duration of your field research.
- **Keep the report's aims in mind while you are observing.** Recording what you observe should not be done randomly or haphazardly; you must be focused and pay attention to details. Enter the observation site [i.e., "field"] with a clear plan about what you are intending to observe and record in relation to the research problem while, at the same time, being prepared to adapt to changing circumstances as they may arise.

- **Consciously observe, record, and analyses what you hear and see in the context of a theoretical framework.** This is what separates data gatherings from reporting. The theoretical framework guiding your field research should determine what, when, and how you observe and act as the foundation from which you interpret your findings in relation to the underlying assumptions embedded in the theoretical framework.

Photography

With the advent of smart phones, an almost unlimited number of high quality photographs can be taken of the objects, events, and people observed during a field study. Photographs can help capture an important moment in time as well as document details about the space where your observation takes place. Taking a photograph can save you time in documenting the details of a space that would otherwise require extensive note taking. However, be aware that flash photography could undermine your ability to observe unobtrusively so assess the lighting in your observation space; if it's too dark, you may need to rely on taking notes. Also, you should reject the idea that photographs represent some sort of "window into the world" because this assumption creates the risk of over-interpreting what they show. As with any product of data gathering, you are the sole instrument of interpretation and meaning-making, not the object itself.

Field note:

There are two primary type of field note:

1. Descriptive field note:

It provides in depth descriptions and depiction of particular setting and events as well as objectives, activities, behaviours and interactions make up these contexts.

- Description of participants
- Description of setting or context
- Discussion and dialogue
- Accounts of behaviour and activities
- Observers behaviour

2. Reflective field notes:

It contain reflective commentary are often focused on the role of the research in relation to the setting and participation, providing the opportunity for resource.

- Reflective commentary
- Role or stances of the research in relation to the setting and participation
- Ethical dilemmas
- Methodological challenges and obstacles
- revelations and epiphanies

Video and Audio Recordings

Video or audio recording your observations has the positive effect of giving you an unfiltered record of the observation event. It also facilitates repeated analysis of your observations. This can be particularly helpful as you gather additional information or insights during your research. However, these techniques have the negative effect of increasing how intrusive you are as an observer and will often not be practical or even allowed under certain circumstances.

Illustrations/Drawings

This does not refer to an artistic endeavor but, rather, refers to the possible need, for example, to draw a map of the observation setting or illustrating objects in relation to people's behavior. This can also take the form of rough tables, charts, or graphs documenting the frequency and type of activities observed. These can be subsequently placed in a more readable format when you write your field report. To save time, draft a table [i.e., columns and rows] on a separate piece of paper before an observation if you know you will be entering data in that way.

Participant observation:

Participatory observation is a central data collection approach within anthropology and other fields such as sociology, psychology, and education; it involves either formal or informal information observation of setting, activities, and events such as meeting, performance,

PRA

PRA is a process which extends into analysis, planning and action. The World Bank defines PRA as a 'family of participatory approaches and methods which emphasize local knowledge and enable local people to do their own appraisal, analysis and planning. 'PRA uses group animation and exercises to facilitate information sharing, analysis and action among stakeholders.

the principles of PRA are: 1) 'handing over the stick' which means surrendering authority to local people in the learning processes, 2) ability to conduct critical examination by and of facilitators of their own roles, personal responsibility i.e. 'using one's own best judgment at all times', 3) multi way sharing of ideas and information and 4) stimulation of 'community awareness'

Focus Group Discussion (FGD)

FGD Campbell (2008) defines a FGD as "a planned, facilitated discussion among a small group of stakeholders designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment". It is the method of rapid assessment and data gathering in which participants congregate to talk about the specific issues and concern based on a list of key themes drawn up by the researcher/facilitator. The main objective of focus group discussion is to acquire knowledge regarding the particular issue. It can be used to collectively assemble and analyses information for many purposes such as the adoption of a particular innovation, needs assessment (Tipping, 1998), program evaluation. For conducting a focus group discussion, a facilitator and assistant to facilitator are needed. The facilitator leads the group discussion and encourages the participants. The assistant to the facilitator is to take notes, run the tape recorder, respond to the unexpected interruptions, and is always ready to follow the facilitator's mode of action. Knowledgeable, pleasing personality, politeness, ability to speak local language, respect to local norms and behavior, ethics, patience etc. are the main criteria of a good facilitator.

Specific objectives of the FGD exercise this exercise was meant specifically to: 1) Understand the group's perceptions of climate change by identifying and ranking some of the main climate change problems presently under debate. 2) Identify and understand the major cause or triggers of the identified problems 3) Identify and understand some of the possible mitigation and adaptation strategy to Climate change. All these were meant to in effect expose the individual as well as groups perception of the present climate change issue under debate with the use of a FGD.

STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES

Who are stakeholders?

Stakeholders are persons, groups or institutions with interest in the project or programme. Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively. Secondary stakeholders are the intermediaries in the aid delivery process. This definition of stakeholder includes both winners and losers and those involved or excluded from decision making process. Key stakeholders are those, who can significantly influence or are important to the success of the project (ODA, 1995). This wide definition clearly includes ourselves (researchers) and farmers along with other disciplinary categories such as policy makers, extension officers, relevant government & nongovernmental organizations.

The word 'stakeholder' was first recorded in 1708 as 'a person who holds the stake or stakes in a bet' (Ramirez, 2001). In business context, a stakeholder as defined by Freeman (1984) is 'any group or individual who can affect or is affected by the achievement of a corporation's purpose'. However, Rölting and Wagemakers (1998), in the context of natural resource management defined stakeholders as 'natural resource users and managers'.

According to ODA (1995) and Allen and Kilvington (2001), there are two types of stakeholders.

i) Primary stakeholders: They are those who are (will be) ultimately affected either positively (e.g., beneficiaries) or negatively (e.g., those involuntarily resettled). They are immediate communities of interest.

ii) Secondary stakeholders: They are the intermediaries in the aid delivery process. They may include government agencies and other institutional bodies. Often these groups do not consider themselves as stakeholders because they feel they own the process.

There is another party called the *Tertiary Stakeholders*. This group consists of those individuals or organizations that do not have any particular 'stake' in the initiative. However, their activities affect the project's functioning and outcome.

What Is Stakeholder Analysis?

A "stakeholder" can be defined as: Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

According to ODA (1995), stakeholder analysis is a tool by which the key stakeholders of a project are identified, their interest in the project is assessed and the ways in which are interest affects project riskiness and viabilities are judged.

Although stakeholder analysis finds its origin to business and managerial science, it is currently used in fields ranging from political science to policy development and international relations (Chevalier, 2001). The concept and related methodology have made significant inroads to poverty reduction studies and applied research pertaining to issues of sustainable livelihood, community based natural resource and conflict management (Ramirez, 1999).

Applications of Stake holder Analysis (SA):

Although SA can be usefully applied to a wide range of policy and management contexts. It is more relevant in complex situations where there are compatibility problems between objectives and stake holders. It is suggested that SA is particularly relevant to natural resource issues where they are characterized by:

- Cross cutting systems and stake holder interests
- Multiple users and users of the resources
- Multiple objectives and concerns
- Temporal trade-offs
- Poverty and under representation
- Market failure

Steps in Stakeholder Analysis:

There are eight major steps in the process:

- 1. Planning the process:** The first step in conducting a stakeholder analysis is to define the purpose of the analysis, identify the potential users of the information, and devise a plan for using the information. A discussion of these issues should be led by the “sponsor,” or initiator, of the stakeholder analysis.
- 2. Selecting and defining a policy:** For a stakeholder analysis to be useful, it must be focused on a specific policy or issue. Again, policy is used in this document to refer to any national, regional, local, or institutional project, program, law, regulation, or rule. In most cases, the sponsor of the stakeholder analysis will have identified a policy, but it is important to ensure that the policy in question is an appropriate topic for a stakeholder analysis before the process begins.
- 3. Identifying key stakeholders:** Identifying the key stakeholders is extremely important to the success of the analysis. Based on the resources available, the working group should decide on the maximum number of stakeholders to be interviewed.
- 4. Adapting the tools:** Generally, very little secondary information is available on stakeholders. As a result, the working group should plan to interview the priority stakeholders identified to gain accurate information on their positions, interests, and ability to affect the process.
- 5. Collecting and recording the information:** Before beginning the interviews, the working group should gather and review secondary information on the priority stakeholders. It should

include any statements regarding the stakeholders' positions on the policy, any goals or objectives of the organizations the stakeholders represent.

6. Filling in the stakeholder table: This step of the process involves taking detailed and often lengthy answers from the interviews and arranging them into a more concise and systematized format.

7. Analysing the stakeholder table: Once the stakeholder table is complete, the information needs to be "analysed." Such an analysis should focus on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests, positions, and possible allies regarding the policy in question.

8. Using the information: Using the information generated by the preceding analysis is an integral part of the stakeholder analysis process.

Benefits/Advantages of stakeholder analysis:

- Identity stakeholders with conflicting interest and provide opportunity for finely adoption of conflict resolution strategies.
- The opinions and views of powerful and influential stakeholders serve as valuable inputs.
- The support and co-ordination of stakeholders are ensured.
- Ensure resource mobilization (both in terms of financial and non-financial).
- Help to identify relations between stakeholders who can be built upon and may enable 'Coalition' of project sponsorship, our-ship and co-operation.
- Identify stakeholders who are sources of risk as threat to the project.
- Identify stakeholders who need empowerment through capacity building or institutional building.
- Help to assess the appropriate type of participation by different stakeholders at successive stage of the project cycle.
- Help to avoid allocation of time and resources to unnecessary individuals or organizations.

Limitations of SA:

1. Though a powerful tool for problem analysis and illuminating the interests of underrepresented, it cannot in itself provide answers to problems.

2. SA, mirrors the groupings and interest of society and in itself does not try to make changes.

3. The process of analysis cannot be extended for examining the role of very large number of stake holders.

4. Cannot be tried to quantify stake holders' likely gains and losses, this is inherently qualitative tool and can best be employed as an illustrative aid to decision making.

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OR ANY SECTOR

A SWOT analysis makes it possible to assess the various strengths, weaknesses, opportunities and threats (SWOTs) within an organization or within the agricultural extension system as a whole. This factsheet examines the four elements of SWOT and the process of conducting an analysis. It provides tips for conducting the analysis and a ready-to-use SWOT analysis template. The factsheet concludes by looking at scenarios when a SWOT analysis is most appropriate, as well as its advantages and disadvantages.

What is SWOT analysis?

SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats. Occasionally, it may also be found as a 'WOTS up' analysis or the TOWS analysis. The technique is credited to Albert Humphrey who led a research project at Stanford University in the 1960s and 1970s using data from leading companies involved in long range planning processes.

A SWOT analysis is a planning tool used to understand key factors - strengths, weaknesses, opportunities, and threats - involved in a project or in an organization. It involves stating the objective of the organization or project and identifying the internal and external factors that are either supportive or unfavorable to achieving that objective. SWOT is often used as part of a strategic or planning process, but can be applied to help understand an organization or a situation, and also for decision-making for many different scenarios.

The SWOT framework:

A SWOT analysis process generates information that is helpful in matching an organization or group's goals, programs, and capacities to the environment in which it operates. The 'SWOT' itself is only a data capture exercise - the analysis follows later.

Strengths: positive tangible and intangible attributes, internal to an organization and within the organization's control.

Weaknesses: internal factors within an organization's control that detract from the organization's ability to attain the desired goal. Which areas might the organization improve?

Opportunities: external attractive factors that represent the reason for an organization to exist and develop. What opportunities exist in the environment, which will propel the organization? Identify them by their 'time frames'.

Threats: external factors beyond the organization's control which could place the organization mission or operation at risk. The organization may benefit by having contingency plans to address them if they should occur. Classify them by their severity and probability of occurrence.

The SWOT process:

Doing a SWOT analysis can be very straight forward, but its strengths lie in its flexibility and experienced application.

- Decide how the information is to be collected and by whom (often a team approach is much more powerful than one person's view).
- Identify appropriate sources of information.
- Gather the information - it's useful to use a template as the basis for exploring the factors and recording the information. See our practical and ready-to-use template below.
- Plot the findings.
- Identify the most important issues.
- Identify strategic options.
- Write a discussion document.
- Disseminate and discuss the findings.
- Decide which activities are a priority in the context of the organisation's goals and values – a possible action plan framework appears below.

The SWOT analysis tips:

Some useful tips for carrying out a SWOT analysis:

1. Collaborate - an analysis that involves multiple perspectives will deliver a better outcome.
2. Use expertise and resources that are already available within the organisation.
3. Use SWOT analysis in conjunction with other techniques, such as PESTLE analysis.
4. Incorporate the analysis into an ongoing process for monitoring changes in the business environment.
5. Try not to get bogged down collecting vast amounts of detailed information without analysing and understanding your findings appropriately.
6. Don't jump to conclusions about the future based on the past or present.

When to use a SWOT analysis:

A SWOT analysis can be used for:

- Workshop sessions.
- Generating ideas and solutions.
- Problem solving.

- Planning.
- Strategic planning (with PESTLE).
- Product evaluation.
- Competitor evaluation (with Porter's five forces).
- Personal development planning.
- Decision making (with Lewin's force field analysis).

For example, using SWOT in a team meeting might include the following steps:

- Invite contributors to participate in the SWOT process.
- Explain the process and establish ground rules.
- Identify strengths.
- Identify weaknesses.
- Identify or list the opportunities and threats – this may well have been identified from a PESTLE analysis previously.
- Establish priorities – from your mission, vision and values work.
- Question each list.

Advantages and Disadvantages of using SWOT analysis:

There are a number of advantages and disadvantages of using the SWOT approach to analysis.

Advantages include:

- ❖ It's a simple four box framework.
- ❖ It facilitates an understanding of the strengths and weaknesses of the organisation.
- ❖ It encourages the development of strategic thinking.
- ❖ It enables senior managers to focus on strengths and build opportunities.
- ❖ It can enable an organisation to anticipate future business threats and take action to avoid or minimise their impact.
- ❖ It can enable an organisation to spot business opportunities and exploit them fully. It's flexible.

Disadvantages include:

- ❖ Some SWOT analysis users oversimplify the amount of data used for decisions – it's easy to use insufficient data.
- ❖ The risk of capturing too much data may lead to 'paralysis by analysis'.
- ❖ The data used may be based on assumptions that later prove to be unfounded.
- ❖ Access to quality internal data sources can be time consuming and politically difficult (especially in more complex organisations – parent company, etc).
- ❖ It lacks detailed structure, so key elements may get missed.
- ❖ The pace of change makes it increasingly difficult to anticipate developments that may affect an organisation in the future.
- ❖ To be effective, the process needs to be repeated on a regular basis.

AGE SEX PYRAMID

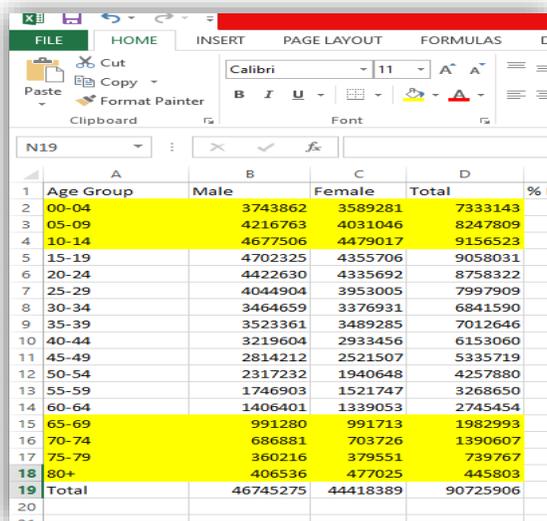
DEFINITION OF AGE SEX PYRAMID

A population **pyramid** or " **age-sex pyramid** " is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically forms the shape of a pyramid when the population is growing.

HOW TO CREATE AGE SEX PYRAMID

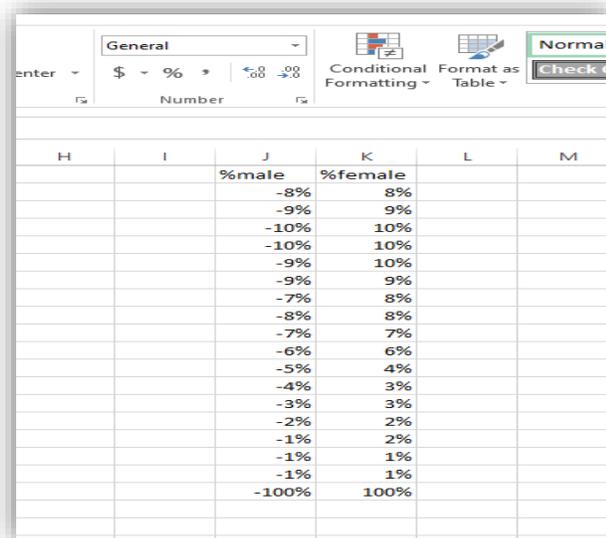
STEPS –

- 1 . First add the data on excel sheet
- 2.calculate the % of the male and female population from the data



The screenshot shows an Excel spreadsheet with the following data:

Age Group	Male	Female	Total	%
00-04	3743862	3589281	7333143	
05-09	4216763	4031046	8247809	
10-14	4677506	4479017	9156523	
15-19	4702325	4355706	9058031	
20-24	4422630	4335692	8758322	
25-29	4044904	3953005	7997909	
30-34	3464659	3376931	6841590	
35-39	3523361	3489285	7012646	
40-44	3219604	2933456	6153060	
45-49	2814212	2521507	5335719	
50-54	2317232	1940648	4257880	
55-59	1746903	1521747	3268650	
60-64	1406401	1339053	2745454	
65-69	991280	991713	1982993	
70-74	686881	703726	1390607	
75-79	360216	379551	739767	
80+	406536	477025	445803	
Total	46745275	44418389	90725906	



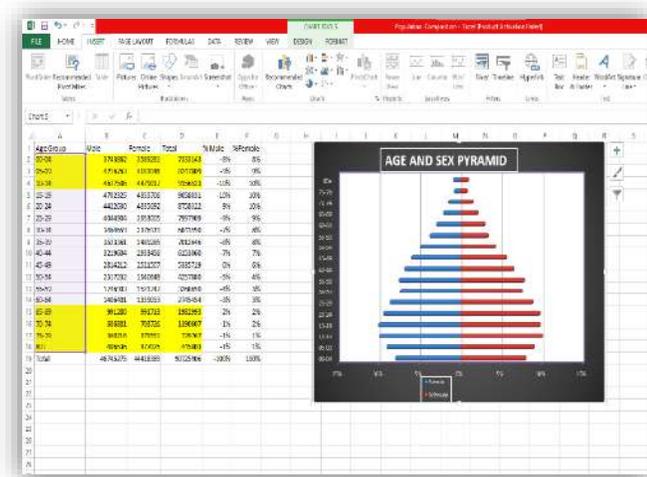
The screenshot shows an Excel spreadsheet with the following data:

	%male	%female
	-8%	8%
	-9%	9%
	-10%	10%
	-10%	10%
	-9%	10%
	-9%	9%
	-7%	8%
	-8%	8%
	-7%	7%
	-6%	6%
	-5%	4%
	-4%	3%
	-3%	3%
	-2%	2%
	-1%	2%
	-1%	1%
	-1%	1%
	-100%	100%

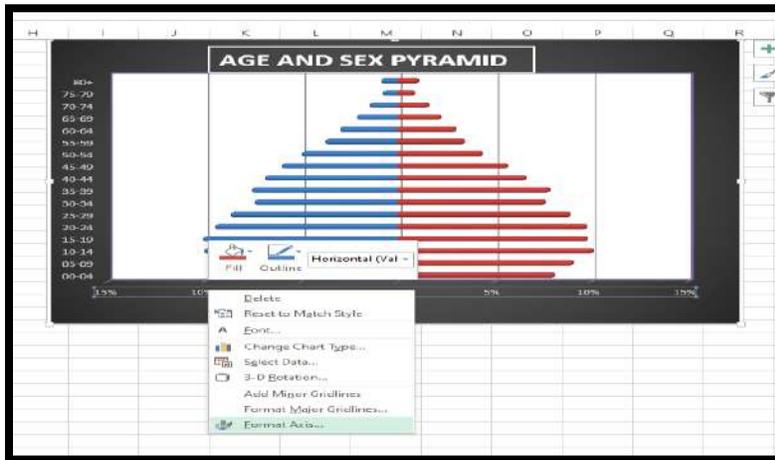
After Calculating the % of the male and female population from the data select the age group with both male and female % population

Age Group	Male	Female	Total	% Male	%Female	%male	%female
00-04	3743862	3589281	7333143	-8%	8%	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%	-3%	3%
65-69	991280	991713	1982993	-2%	2%	-2%	2%
70-74	686881	703726	1390607	-1%	2%	-1%	2%
75-79	360216	379551	739767	-1%	1%	-1%	1%
80+	406536	477025	445803	-1%	1%	-1%	1%
Total	46745275	44418389	90725906	-100%	100%	-100%	100%

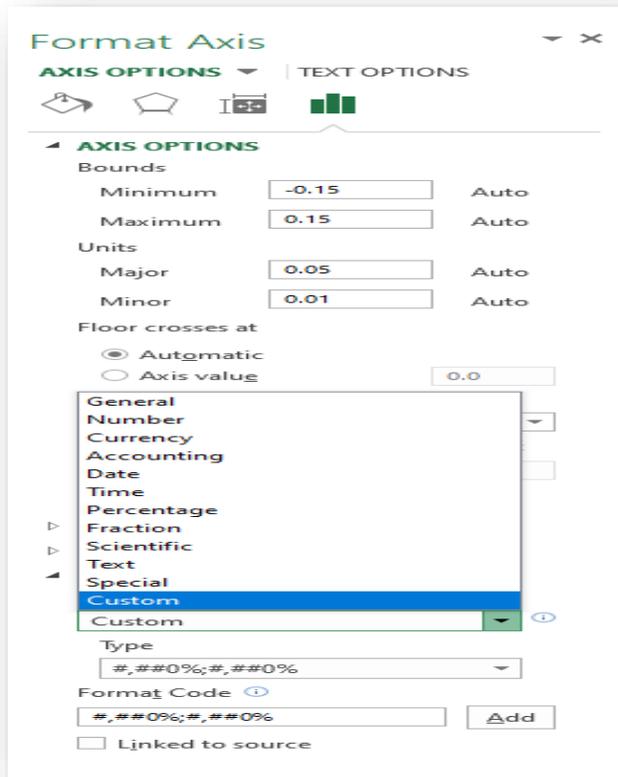
Then go to insert select a suitable bar



1. After your age and sex pyramid was appear then you have to remove [-] Portion from the horizontal plane --- right click on it ----then format axis.

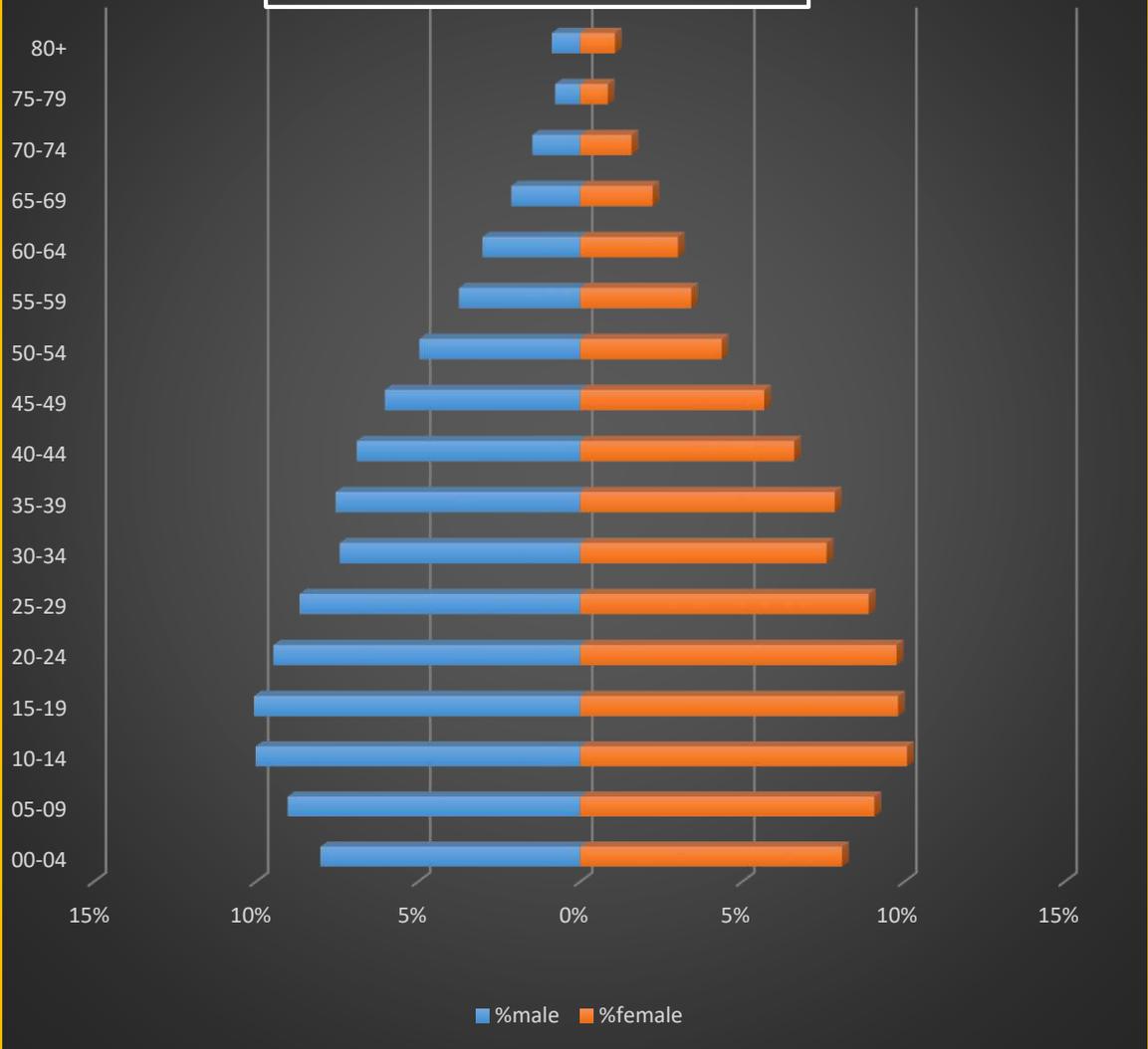


Then this type of tool box was open > go to number> click on customs



1. than this type of tool box was open > go to number> click on customs

AGE AND SEX PYRAMID



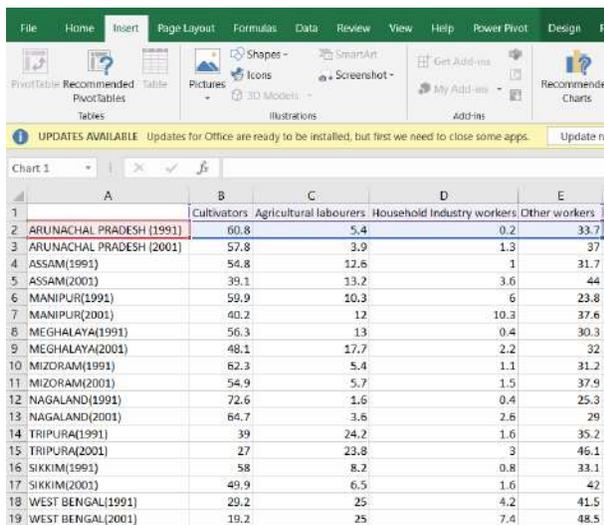
Occupational Structure

What is Occupational Structure?

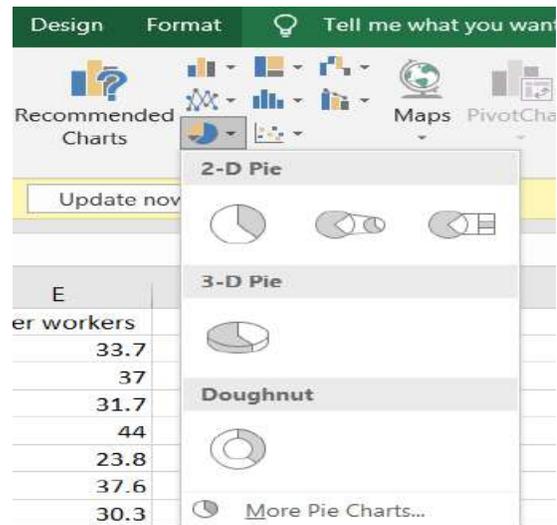
The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a country who are employed in different sectors like agriculture, manufacturing and transport, among many others constitute the occupational structure of a nation.

Steps for occupational structure:

1. At first add the data on excel sheet.
2. Now select the data according to your choice → go to Insert → select recommended charts and click 3a-D Pie → ok.



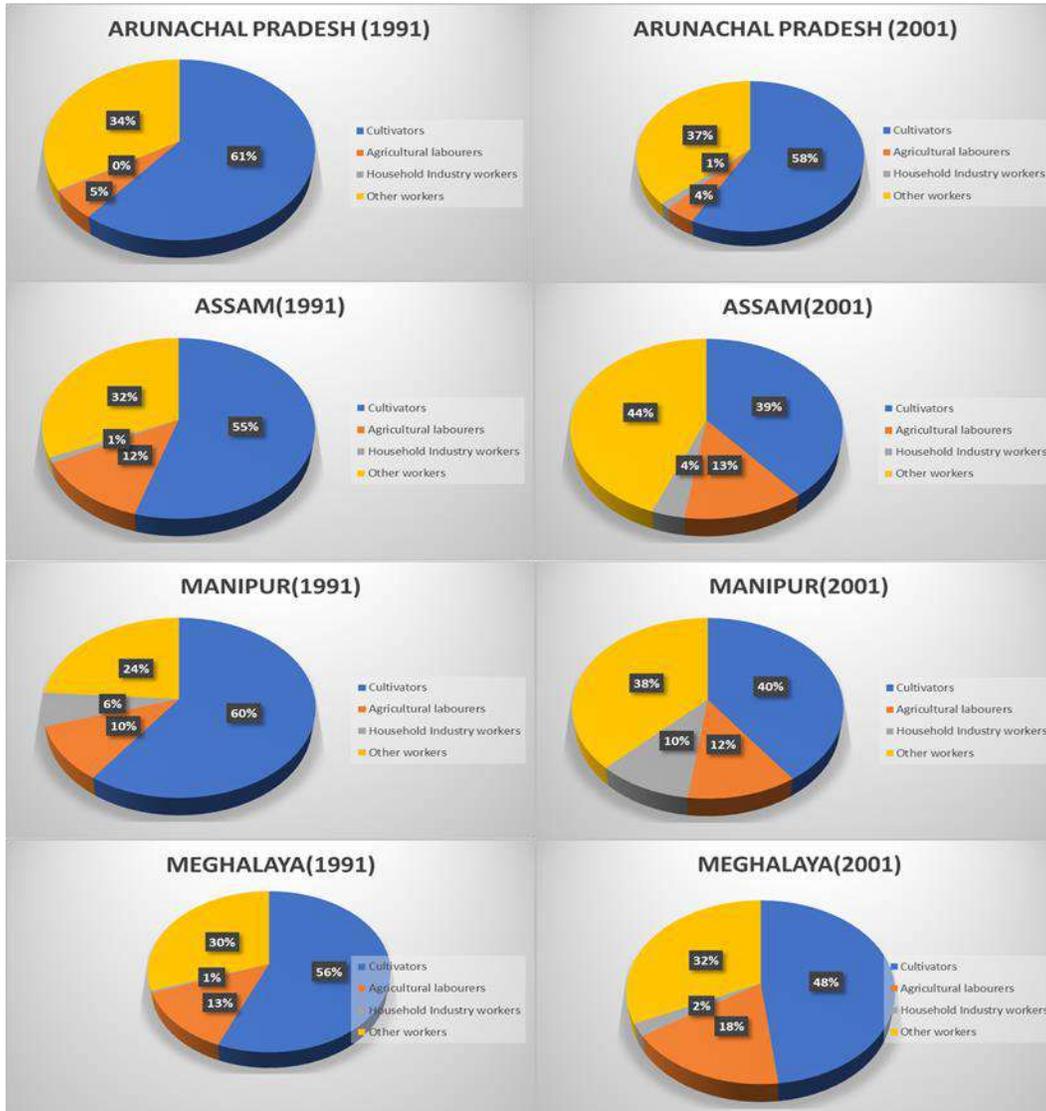
	A	B	C	D	E
		Cultivators	Agricultural labourers	Household Industry workers	Other workers
1					
2	ARUNACHAL PRADESH (1991)	60.8	5.4	0.2	33.7
3	ARUNACHAL PRADESH (2001)	57.8	3.9	1.3	37
4	ASSAM(1991)	54.8	12.6	1	31.7
5	ASSAM(2001)	39.1	13.2	3.6	44
6	MANIPUR(1991)	59.9	10.3	6	23.8
7	MANIPUR(2001)	40.2	12	10.3	37.6
8	MEGHALAYA(1991)	56.3	13	0.4	30.3
9	MEGHALAYA(2001)	48.1	17.7	2.2	32
10	MIZORAM(1991)	62.3	5.4	1.1	31.2
11	MIZORAM(2001)	54.9	5.7	1.5	37.9
12	NAGALAND(1991)	72.6	1.6	0.4	25.3
13	NAGALAND(2001)	66.7	3.6	2.6	29
14	TRIPURA(1991)	39	24.2	1.6	35.2
15	TRIPURA(2001)	27	23.8	3	46.1
16	SIKKIM(1991)	58	8.2	0.8	33.1
17	SIKKIM(2001)	49.9	6.5	1.6	42
18	WEST BENGAL(1991)	29.2	25	4.2	41.5
19	WEST BENGAL(2001)	19.2	25	7.4	48.5



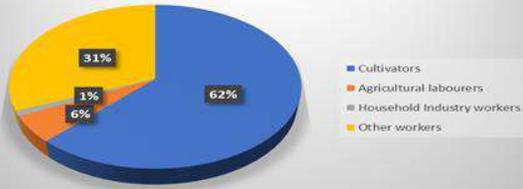
3. After that select the pie diagram → then copy and paste the diagram and merge → save as image → ok.

Pie Diagram

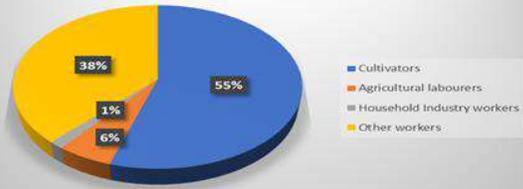
Showing Occupational Structure of North Eastern State Of India



MIZORAM(1991)



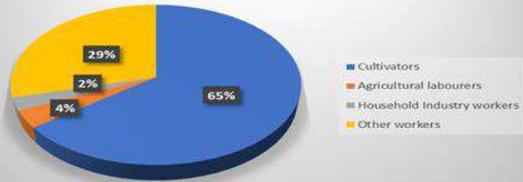
MIZORAM(2001)



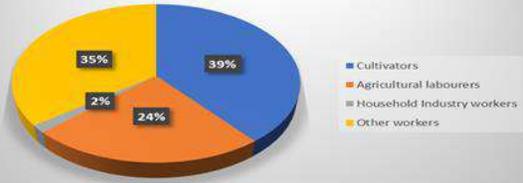
NAGALAND(1991)



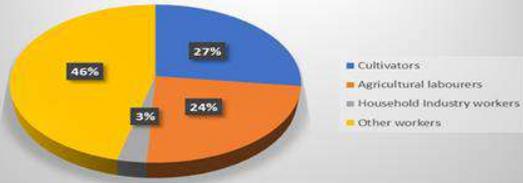
NAGALAND(2001)



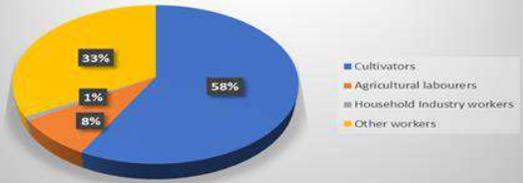
TRIPURA(1991)



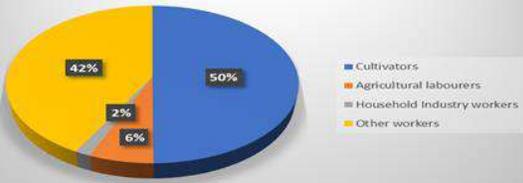
TRIPURA(2001)



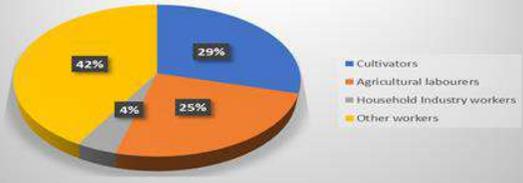
SIKKIM(1991)



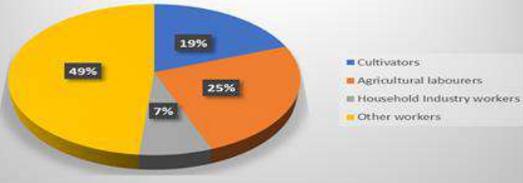
SIKKIM(2001)



WEST BENGAL(1991)



WEST BENGAL(2001)



MIGRATION

MIGRATION DEFINITION

Migration is the progress of people from one place to another, to establish their permanent or semi-permanent residence at the destination. Immigration is an essential component of change, [structure](#), and population growth, as are birth rates and mortality.

There are attraction factors and pushing factors in one place, which influence a person's decision to move. The first are those that attract people to stay, such as low crime rates, pleasant weather, political stability, and excellent employment opportunities. Push factors encourage people to leave the place, such as poverty, war, and floods. [Migration] is usually voluntary, but there are many specific reasons why a person can do it. Sometimes it is forced. Immigration has been a widespread phenomenon throughout the history of humanity; however, nomadic movements are non-migratory, since their purpose is not to settle permanently or semi-permanently in one place. Nor are tourist trips, pilgrimages, and other actions that do not have this end.

Causes

The causes vary, from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area. The roots of [migration] are the following:

Economic Seek employment, start or continue a career, in particular, take advantage of the economic benefits of a specific country, and so on.

Social stay close or live with the family, seek a better quality of lifestyle, and so on.

Policies from persecutions, wars, and other types of problems or political conflicts that put lives at risk.

Cultural improve the quality of [education](#), seek religious affinity or tolerance, taste for the culture of the country, and so on.

Environmental Escape from natural disasters, find a place with a more pleasant climate, and so on.

TYPES OF MIGRATION

1. Internal migration:

Internal migration is a migration that takes place within the borders of a country or territory;

2. External or international migration:

Migration is international when it refers to changes in habitual residence between countries;

3. "Lifetime" migration:

The "lifetime" migration is defined by relating the place of birth and the place of residence to a reference date. The migrant "life-time" is any individual who resides in an administrative entity other than his or her place of birth.

4. Migrator flows:

Migration flows refer to movements (in and out) of population (nationals and foreigners) that occur at the borders of a given country;

5. Stock of migrants:

Migrant stocks are referred to as the number of migrants (immigrants and emigrants) residing in a country with a certain length of stay, irrespective of the socioeconomic characteristics (migrant workers, refugees, students, etc.) of migrants;

6. Diaspora:

A diaspora is defined both as the dispersion of a people in foreign countries and the formation of a community of that people in those countries;

7. clandestine/irregular migration:

There is "clandestine migration" when a foreigner enters a country without respecting the entry conditions or has entered illegally, remains there beyond the time allowed by law.

LAND USE AND LAND COVER MAPS

The terms land use and land cover are often used interchangeably, but each term has its own unique meaning. Land cover refers to the surface cover on the ground like vegetation, urban infrastructure, water, bare soil etc. Identification of land cover establishes the baseline information for activities like thematic mapping and change detection analysis. Land use refers to the purpose the land serves, for example, recreation, wildlife habitat, or agriculture.

When used together with the phrase Land Use / Land Cover (LULC) generally refers to the categorization or classification of human activities and natural elements on the landscape within a specific time frame based on established scientific and statistical methods of analysis of appropriate source materials. Land cover is the physical material at the surface of the earth. Land use is the description of how people utilize the land for the socio-economic activities.

Reason to use Land use and Land cover maps:-

- LULC maps play a significant and prime role in **planning, management and monitoring programmes** at local, regional and national levels. This type of information, on one hand, provides a better understanding of **land utilization aspects** and on the other hand, it plays an important role in **the formation of policies and programme required for development planning**.
- For ensuring sustainable development, it is necessary to **monitor the ongoing process on land use/land cover** pattern over a period of time.
- **In order to achieve sustainable urban development** and to **check the haphazard development** of towns and cities, it is necessary that authorities associated with the urban development generate such planning models so that every bit of available land can be used in most rational and optimal way.
- LULC maps also help us to **study the changes** that are happening in our ecosystem and environment and **we can make policies and launch programmes to save our environment**.

LULC classification:-

LULC classification is one of the most widely used applications in remote sensing. The most commonly used approaches include:

Unsupervised classification, supervised classification, Image segmentation, NDVI

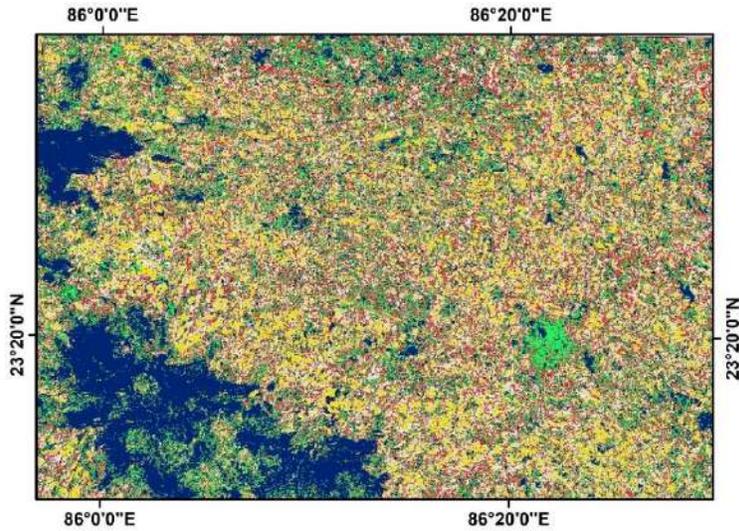
Applications of LULC maps:-

- Natural resource management
- Wildlife habitat protection
- Baseline mapping for GIS input
- Urban expansion / encroachment
- Routing and logistics planning for seismic / exploration/resource extraction activities
- Damage delineation (tornadoes, flooding, volcanic, seismic, fire)
- Legal boundaries for tax and property evaluation. Target detection - identification of landing strips, roads, clearings, bridges, land/water interface.

Steps to create Land use and Land cover Maps:-

Data downloading → Downloading vector data → Downloading ESA Global land cover dataset → Data pre-processing → loading vector data into QGIS → Extracting shape file for chosen area → Adding ESA land cover data to QGIS → clipping ESA Global land cover dataset → Data preparation → Install SCP Plugin in QGIS → QGIS Install Plugin Window → SCP Dock → Import Data → Select Directory SCP Plugin → Creating a Bandset → SCP Bandset Page → SCP Plugin Bandset window with the single band list loaded → Pixel information for each band → Area image before changing band rendering → Create training input → Create classes → Change Band Rendering → Create ROIs → Assess ROIs → Spectral Signature Plot → Run classification → Ground cover classification → SCP land cover change outputs → Layer Properties, Symbology → Land cover change output map

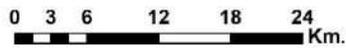
Preparation of a simple landuse map



Legend

Landuse categories

-  Reservoir
-  Vegetation
-  Settlement
-  Marshy land
-  Agricultural land



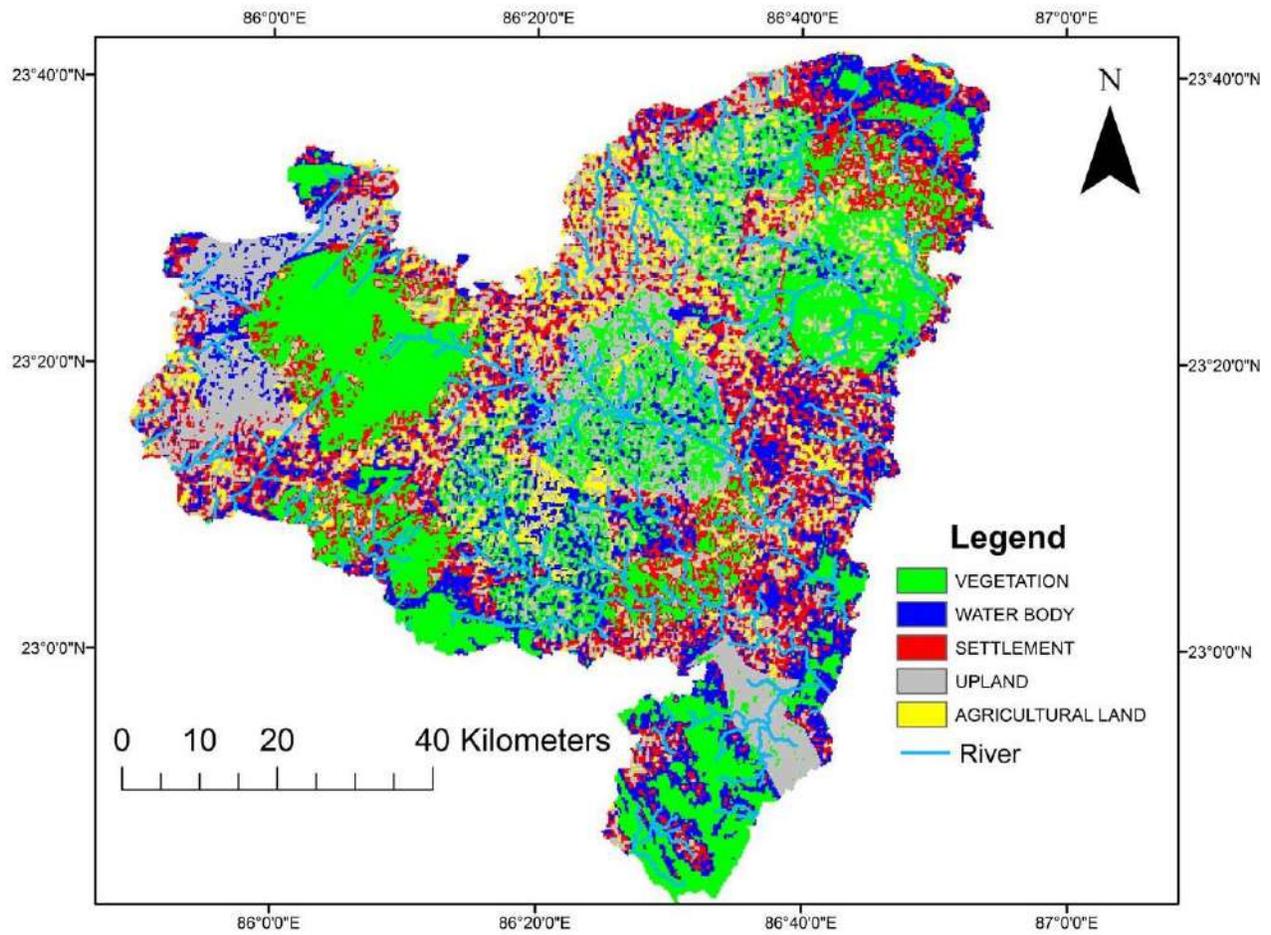
Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation:-

Here in this land use map, there is a reservoir in the north-east side of the area, which is indicated by blue. We can notice, most of this area is covered by agricultural land, which is highlighted by yellow. There are some vegetation in this area which is covered with green. In this area we can see settlement with medium density as red colour. There are marshy land which is noticed very often and this is noticed as grey colour.

We can get a land use and land cover map of Purulia district.

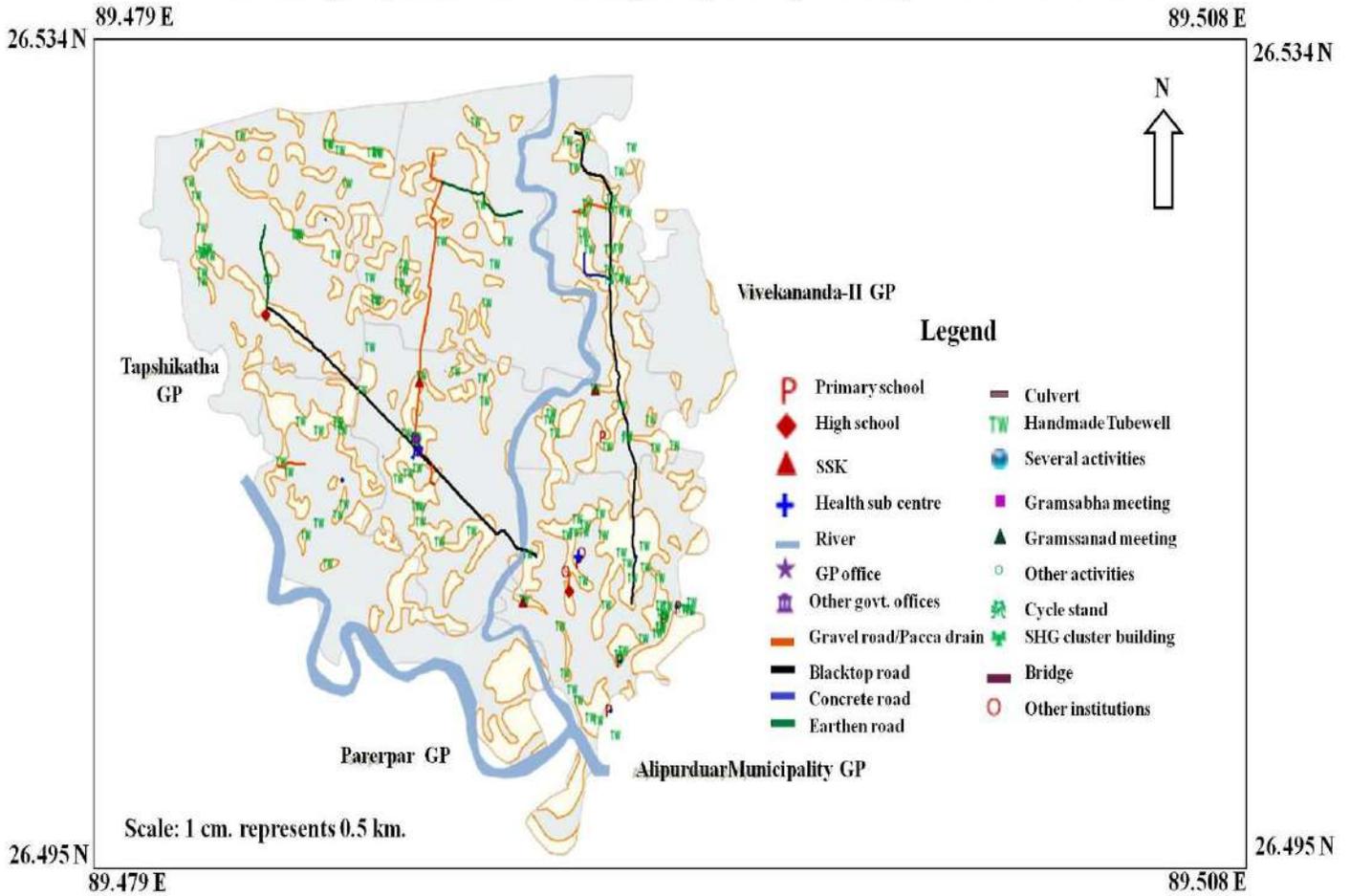
LANDUSE MAP OF PURULIA DISTRICT (2019)



Interpretation:-

In this land use map, there are vegetation in northern part and also in east and north-east, middle side of Purulia, which is high in density and indicated as green. We can noticed reticulated river which is flow from north to east and also some tributary river in the northern side of Purulia district, the river is mentioned by sky blue. There are agricultural land in all over the area of this locality and is highlighted by yellow. In the northern side and eastern side there are upland which is mentioned as grey. There are dense settlement pattern all over the area of Purulia district, this is highlighted in red colour. There are thick water body in north and east part of the area and also some water body can noticed all over the area of this map. The water body is indicated by deep blue.

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation:-

In this planning map of Banchukumari gram panchayet of Alipurduar, we can see a river running from north to east and a tributary river is joined from north-east side of the area. There are four primary school in the east corner. Also there are two high schools and two SSK, health center, GP office, and other government office in the same direction. So we can say that many of these official buildings, education and health sector is located in the east corner of this area. In this block there have pacca drain and gravel road in the middle portion of the area. There are two blacktop road in the middle and east part of this block. Each locality have their own handmade tubewell. There are concrete road in the north and north-east side of this block.

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DEVELOPMENT PRACTICAL**

PRACTICAL COPY

What is Research? Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.

DEFINITION OF GOOD LITERATURE REVIEW: *A literature review surveys books, scholarly articles, and any other sources relevant to a particular issue, area of research, or theory, and by so doing, provides a description, summary, and critical evaluation of these works in relation to the research problem being investigated. Literature reviews are designed to provide an overview of sources you have explored while researching a particular topic and to demonstrate to your readers how your research fits within a larger field of study.*

IMPORTANTS OF A GOOD LITERATURE REVIEW: *A literature review may consist of simply a summary of key sources, but in the social sciences, a literature review usually has an organizational pattern and combines both summary and synthesis, often within specific conceptual categories. A summary is a recap of the important information of the source, but a synthesis is a re-organization, or a reshuffling, of that information in a way that informs how you are planning to investigate a research problem. The analytical features of a literature review might:*

- *Give a new interpretation of old material or combine new with old interpretations,*
- *Trace the intellectual progression of the field, including major debates,*
- *Depending on the situation, evaluate the sources and advise the reader on the most pertinent or relevant research, or*
- *Usually in the conclusion of a literature review, identify where gaps exist in how a problem has been researched to date.*

The purpose of a literature review is to:

- *Place each work in the context of its contribution to understanding the research problem being studied.*
- *Describe the relationship of each work to the others under consideration.*
- *Identify new ways to interpret prior research.*
- *Reveal any gaps that exist in the literature.*
- *Resolve conflicts amongst seemingly contradictory previous studies.*
- *Identify areas of prior scholarship to prevent duplication of effort.*
- *Point the way in fulfilling a need for additional research.*
- *Locate your own research within the context of existing literature [very important].*

SELECTING STUDY AREA: *Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work”^[1]. Ideally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.*

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

There are few areas in business studies that can offer interesting topics due to their dynamic nature. The following is the list of research areas and topics that can prove to be insightful in terms of assisting you to choose your own dissertation topic.

TARGET POPULATION:

The target population for a survey is the entire set of units for which the survey data are to be used to make inferences. Thus, the target population defines those units for which the findings of the survey are meant to generalize. Establishing study objectives is the first step in designing a survey. Defining the target population should be the second step.

Target populations must be specifically defined, as the definition determines whether sampled cases are eligible or ineligible for the survey. The geographic and temporal characteristics of the target population need to be delineated, as well as types of units being included. In some instances, the target population is restricted to exclude population members that are difficult or impossible to interview. For instance, area household

What is Hypothesis? Hypothesis is an assumption that is made on the basis of some evidence. This is the initial point of any investigation that translates the research questions into a prediction. It includes components like variables, population and the relation between the variables. A research hypothesis is a hypothesis that is used to test the relationship between two or more variables.

Characteristics of Hypothesis

Following are the characteristics of hypothesis:

- *The hypothesis should be clear and precise to consider it to be reliable.*
- *If the hypothesis is a relational hypothesis, then it should be stating the relationship between variables.*
- *The hypothesis must be specific and should have scope for conducting more tests.*
- *The way of explanation of the hypothesis must be very simple and it should also be understood that the simplicity of the hypothesis is not related to its significance.*

Sources of Hypothesis

Following are the sources of hypothesis:

- *The resemblance between the phenomenon.*
- *Observations from past studies, present-day experiences and from the competitors.*
- *Scientific theories.*
- *General patterns that influence the thinking process of people.*

Types of Hypothesis

There are six forms of hypothesis and they are:

- Simple hypothesis
- Complex hypothesis
- Directional hypothesis
- Non-directional hypothesis
- Null hypothesis
- Associative and casual hypothesis

Simple Hypothesis

It shows a relationship between one dependent variable and a single independent variable. For example – If you eat more vegetables, you will lose weight faster. Here, eating more vegetables is an independent variable, while losing weight is the dependent variable.

Complex Hypothesis

It shows the relationship between two or more dependent variables and two or more independent variables. Eating more vegetables and fruits leads to weight loss, glowing skin, reduces the risk of many diseases such as heart disease, high blood pressure and some cancers.

Directional Hypothesis

It shows how a researcher is intellectual and committed to a particular outcome. The relationship between the variables can also predict its nature. For example- children aged four years eating proper food over a five-year period are having higher IQ levels than children not having a proper meal. This shows the effect and direction of effect.

Non-directional Hypothesis

It is used when there is no theory involved. It is a statement that a relationship exists between two variables, without predicting the exact nature (direction) of the relationship.

Null Hypothesis

It provides the statement which is contrary to the hypothesis. It's a negative statement, and there is no relationship between independent and dependent variables. The symbol is denoted by "HO".

Associative and Causal Hypothesis

Associative hypothesis occurs when there is a change in one variable resulting in a change in the other variable. Whereas, causal hypothesis proposes a cause and effect interaction between two or more variables.

Examples of Hypothesis

Following are the examples of hypothesis based on their types:

- Consumption of sugary drinks every day leads to obesity is an example of a simple hypothesis.*
- All lilies have the same number of petals is an example of a null hypothesis.*
- If a person gets 7 hours of sleep, then he will feel less fatigue than if he sleeps less.*

Functions of Hypothesis

Following are the functions performed by the hypothesis:

- Hypothesis helps in making an observation and experiments possible.*
- It becomes the start point for the investigation.*
- Hypothesis helps in verifying the observations.*
- It helps in directing the inquiries in the right directions.*

QUESTIONNAIRE AND SCHEDULE:

What is a Questionnaire?

A questionnaire, or survey instrument, is a series of questions designed to elicit information from respondents that relate to the marketer's research question. Questionnaires are administered by surveying respondents. A questionnaire must fulfill four basic tasks:

- 1. Collect appropriate data that meet the research objectives*
- 2. Make data available for analysis*
- 3. Minimize the bias, or distortions, caused by poorly worded questions and improper survey administration*
- 4. Make the questions varied and engaging to eliminate respondent fatigue[1]*

Questionnaires standardize data collection. Every respondent is asked the same question. Researchers develop questionnaires based on the survey objectives, which are developed from the understanding of the research problem and the selected pool, or sample, of respondents. As such, questionnaires play a

critical role on the Marketing Research process. Questionnaires are a critical tool for Descriptive and Causal Marketing Research.

An effective questionnaire is based on the survey objectives and is designed to elicit the needed data from respondents in a manner that does not introduce bias. From the researcher's perspective, bias is anything that distorts the findings.

The Place of Questionnaires in the Research Process



What Makes a Questionnaire Effective?

An effective questionnaire meets the following criteria:

- 1. It provides information that the decision-makers need*
- 2. It limits the sources of bias due to the structure of the questionnaire and its administration*
- 3. It elicits information from the respondents without stressing them*
- 4. It is designed for the manner in which the questionnaire will be administered. Surveys can be administered several ways:*
 - a. Face-to-face interviews administered by an interviewer*
 - b. Telephone interviews administered by an interviewer*
 - c. Respondent-administered interviews using a questionnaire printed on paper*
 - d. Respondent-administered interviews using an online questionnaire*
- 5. It is designed to make data analysis simple and less prone to error. The respondents' answers should be easily coded and edited to ensure that the questionnaires are properly administered and the answers recorded correctly.*

Some Common Practices for Creating Effective Questionnaires

Most marketing researchers follow these guidelines for creating questionnaires:

- 1. Work Collaboratively:** *Researchers collaborate with their clients to make certain the questionnaire will generate the information the client needs to make decisions about a marketing problem. A major part of this collaboration deals with defining the research and survey objectives, working within the budget and timetable, and considering whom to survey. If the budget is too small to conduct a survey or if there is not enough time to administer it, the researchers should not conduct the survey. In these cases, the client should rely on judgment or the findings from Exploratory Research.*

2. **Follow the KISS Principle (KISS stands for: Keep It Simple, Stupid):** Questions must be carefully written. To capture respondents' beliefs, thoughts, and feelings, **simplicity** is key. Respondents must understand it. Avoid jargon. Write in the respondents' vernacular.
3. **Choose a Method for Administering the Survey:** There are a variety of ways to administer surveys: Face-to-face interviews, phone interviews, self-administered interviews online, self-administered interviews with questionnaires delivered through the postal service. Each has its advantages and disadvantages, which we will review later in this lesson.
4. **Repetition is good:** Ask the same question two or three times, but phrase the questions differently. Too much repetition, however, leads to long questionnaires. Long questionnaires can be burdensome for respondents.
5. **Screen Respondents:** Even the most carefully developed survey selects unqualified respondents. Good questionnaires ask screener questions to filter out unqualified respondents.
6. **Test the Questionnaire:** Smart researchers conduct a pilot test of the questionnaire among a small sample. The purpose of pilot testing is to determine whether questions should be reworded, reordered, or eliminated.

The major differences between the Questionnaire and Schedule are:

Questionnaire	Schedule
The questionnaire is one of the methods used for data collection. The questionnaire will have many questions, with each question having multiple choices.	The schedule is also one of the methods of data collection. It will have a set of statements, questions and space given to note down the answers.
Questionnaire method of data collection is preferred when the respondents are willing to cooperate. In addition, to deploy this method the respondents need to be literate.	The Schedule method of data collection can be utilised irrespective of the respondent's literacy. It can be used when the respondents are literate and can be used even when the respondents are illiterate.
The type of technique used in the Questionnaire method is Quantitative.	The type of technique used in the Schedule method is Qualitative.
In the Questionnaire method, the grouping is made on the basis of different categories like location, age, gender etc.	In the schedule method of data collection, the grouping may exist or may not exist.
Informants receive questionnaires through emails, posts and the answers will be given as per instructions given in the cover letter.	Answers in the Schedule method of data collection are filled by research workers/enumerators.
In the Questionnaire method, there is no scope for direct personal contact with the respondents.	In the Schedule method, there is direct personal contact of the respondents with the enumerators.
The cost incurred in the questionnaire method of data collection is economical in comparison with the schedule. The cost is less	The cost incurred in the Schedule method of data collection is very expensive since there is the cost involved in preparing the schedule, cost incurred on

even if the sample size used is very large. Predominantly the money is spent on preparing questionnaires only.	enumerators in addition to the training imparted to them.
The coverage of Questionnaire method is large as the questionnaires can even be sent to respondents who are not easily accessible.	The coverage of this method is relatively small as there are constraints in sending enumerators to larger areas.
In the questionnaire, there is a higher possibility of collecting wrong or incomplete information when respondents are unable to have a clear understanding of the given question.	The possibility of receiving inaccurate answers or incomplete answers due to difficulties in understanding the question can be ruled out in this method of data collection as the enumerators will be present and they can resolve any doubts and queries of respondents.
In the Questionnaire method, respondents will get sufficient time to think before answering questions.	The time available for respondents while answering questions is limited in the Schedule method when compared to the Questionnaire method.
In Questionnaires, responses are filled by the respondents.	In Schedule, method responses are filled by the enumerators themselves.
In the Questionnaire method, there is no scope for bias or the answers getting influenced by the interviewers thought process as the answers are filled by the respondents themselves.	In the Schedule method of data collection, there is scope for bias or the answers getting influenced by the enumerator as the answers to the questions are filled by enumerators although the answers are given by the respondents.
The response rate of the Questionnaire method is low compared to the Schedule method.	The response rate in the Schedule method of data collection is high.
In the Questionnaire method, the identity of the respondent is not known.	In the Schedule method, the identity of the respondent is known.
The Questionnaire quality determines the success of the questionnaire method of data collection.	The success of the Schedule method of data collection is dependent on the efficiency, integrity and honesty of the Schedule method of data collection

Participatory Rural Appraisal

"Participatory Rural Appraisal (PRA) recently renamed Participatory Learning for Action (PLA), is a methodological approach that is used to enable farmers to analyse their own situation and to develop a common perspective on natural resource management and agriculture at village level.

PRA is an assessment and learning process that empowers farmers to create the information base they need for participatory planning and action. Outsiders contribute facilitation skills and external information and opinions. Many different tools have been developed for use in PRA. There are four main classes: tools used in group and team dynamics; tools for sampling; options for interviews and dialogue; and options for visualisation and preparing diagrams. Most countries have had some experience with PRA and local publications are available.

FOCUS GROUP DISCUSSION: A focus group is a group interview involving a small number of demographically similar people or participants who have other common traits/experiences. Their reactions to specific researcher/evaluator-posed questions are studied. Focus groups are used in [market research](#) to better understand people's reactions to products or services or participants' perceptions of shared experiences. The discussions can be guided or open. In market research, focus groups can explore a group's response to a new product or service. As a program evaluation tool, they can elicit lessons learned and recommendations for performance improvement. The idea is for the researcher to understand participants' reactions. If group members are representative of a larger population, those reactions may be expected to reflect the views of that larger population.^{[1][2][3]} Thus, focus groups constitute a research or evaluation method that researchers organize for the purpose of collecting [qualitative data](#), through interactive and directed discussions.^[4]

A focus group is also a technique used by sociologists, psychologists, and researchers in communication studies, education, political science, and public health.^[4] [Marketers](#) can use the information collected from focus groups to obtain insights on a specific product, controversy, or topic.^[5] Used in [qualitative research](#), the interviews involve a group of people who are asked about their perceptions, attitudes, opinions, beliefs, and views regarding many different topics (e.g., abortion, political candidates or issues, a shared event, needs assessment). Group members are often free to talk and interact with each other. Instead of a researcher/evaluator asking group members questions individually, focus groups use group interaction to explore and clarify the beliefs, opinions, and views of participants. The interactivity of focus groups allows researchers to obtain qualitative data from multiple participants, often making focus groups a relatively expedient, convenient, and efficacious research method.^[6] While the focus group is taking place, the facilitator either takes notes and/or records the discussion for later note-taking in order to learn from the group. Researchers/evaluators should select members of the focus group carefully in order to obtain useful information. Focus groups may also include an observer who pays attention to dynamics not expressed in words e.g. body language, people who appear to have something to add but do not speak up.

POPULATION COMPOSITION:

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

THE AGE STRUCTURE:

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations

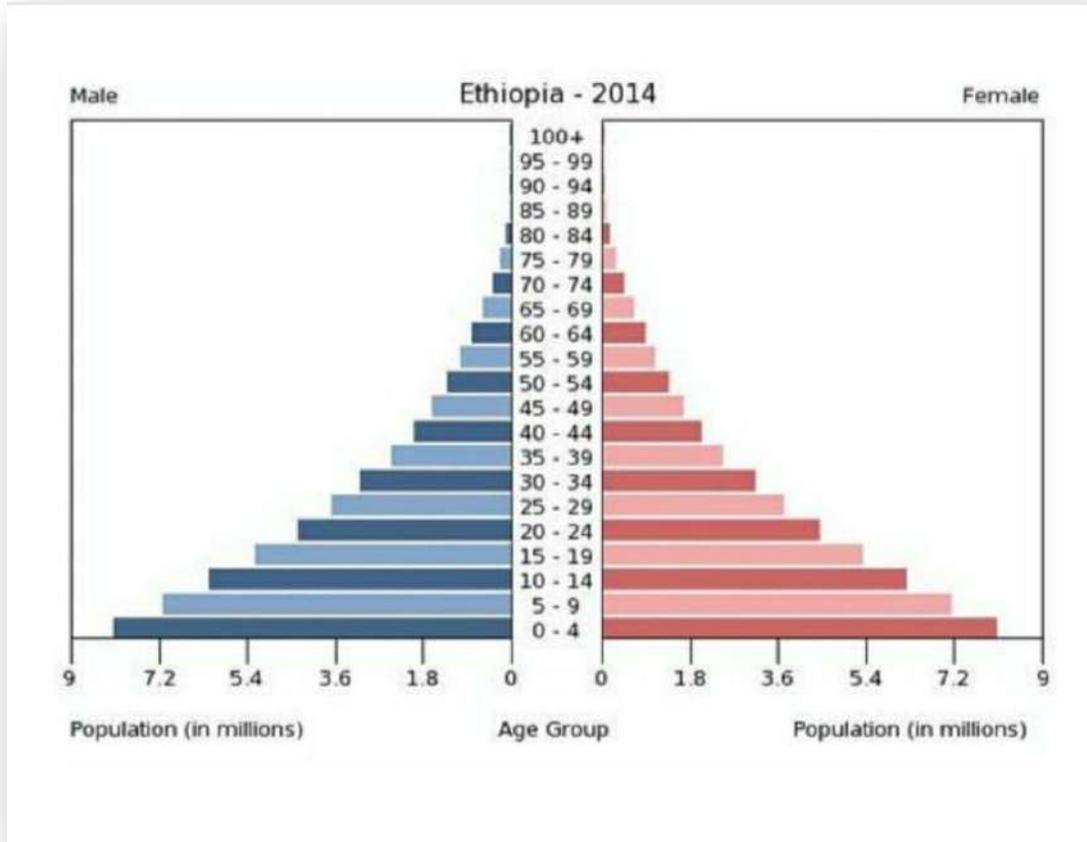
(Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

THE POPULATION PYRAMID: Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

CALCULATION TABLE OF POPULATION PYRAMID

Age Group	Male	Female	Total
00-04	37,43,862	35,89,281	73,33,143
05-09	42,16,763	40,31,046	82,47,809
10-14	46,77,306	44,79,017	91,56,323
15-19	47,02,325	43,51,706	90,54,031
20-24	44,22,630	43,35,692	87,58,322
25-29	40,44,904	39,53,003	79,97,907
30-34	34,64,659	33,76,951	68,41,610
35-39	35,23,361	34,89,283	70,12,644
40-44	31,19,604	29,33,456	60,53,060
45-49	28,14,212	25,21,507	53,35,719
50-54	23,17,232	19,40,648	42,57,880
55-59	17,46,503	15,21,747	32,68,250
60-64	14,06,401	13,39,053	27,45,454
65-69	9,91,280	9,91,713	19,82,993
70-74	6,86,581	7,03,726	13,90,307
75-79	3,60,216	3,79,551	7,39,767
80+	4,06,536	4,77,025	8,83,561
Total	4,44,16,389	4,58,92,601	9,072,5906

THE POPULATION PYRAMID



DEFINITION OF MIGRATION: Migration can be used for the journey from one place to another or for the act of movement. Thousands of mid-western farmers made the migration to California during the dust bowl. Demographers have noted the migration of young people to the big cities presumably for work. With animals, it's almost always in reference to a seasonal change in location. On boat tours, you can see the whales during their annual migration down the West coast.

What are Different Types of Migration?

Migration could come in different forms depending on the nature and the reason of the movement.

The first – and the most common – classification of migration refer to the nature of movement. This would include immigration and emigration. Immigration refers to the movement of persons or population to another country. Emigration, on the other hand, refers to the movement of persons or populations from one country. For example, immigration of Filipinos to the United States and emigration of Indians from India.



The second classification of migration refers to permanence. Under permanence, we have permanent, temporary, voluntary, and forced. Permanent migration refers to the movement from one area to another without plans of returning to the place of origin. Temporary migration refers to the migration done on a limited time. Forced migration involves migrants leaving without any choice. Voluntary migration is the opposite of forced.

The third classification of migration refers to the nature of location. Under such classification, we have internal and international. Internal migration refers to a change of residence within the country. It is also known as internal migration. International migration, on the other hand, refers to the change of residence to different nations or countries. It is also known as external migration.

There are other types of migration. Here are as follows.

1. **Gross migration** refers to the total number of arrivals of immigrants and the departures of emigrants.
2. Net migration **refers to the difference between the total number of people coming in and the sum of people living out. It could also refer to the difference between the number of immigrants and the number of emigrants.**
3. Impelled migration **refers to the movement of people from a country or area because of unfavorable instances.**
4. Step migration **refers to the progressive migration from a shorter distance to a farther destination.**
5. Chain migration **refers to a series of migration which a defined group of people.**
6. **Rural-urban migration** refers to the movement of people from the rural areas to a specific region in the urban area of a country. This could be brought about by the presence of better opportunities for work in the urban areas.
7. **Interregional migration** refers to the movement of populations from a region to another region in a country.
8. **Intercontinental migration** refers to the movement of people between and among different continents. For example, people from Asia would move to Europe.
9. **Intracontinental migration** refers to the movement of people between and among countries within the same continent. For example, people from Thailand would move to Japan. Both countries are found in Asia.
10. **Seasonal migration** refers to the movement of people or animals due to climate or seasonal reasons. For instance, some people would move to another place in order to plant crops or harvest. Animals, on the other hand, would migrate to prepare for the winter season.
11. **Return migration** refers to the return of people to their country of origin after leaving the country which they went at.

Pull and Push Factors of Migration

People migrate to other places because of different reasons. Lee's laws divide these reasons into two factors: pull factors and push factors.

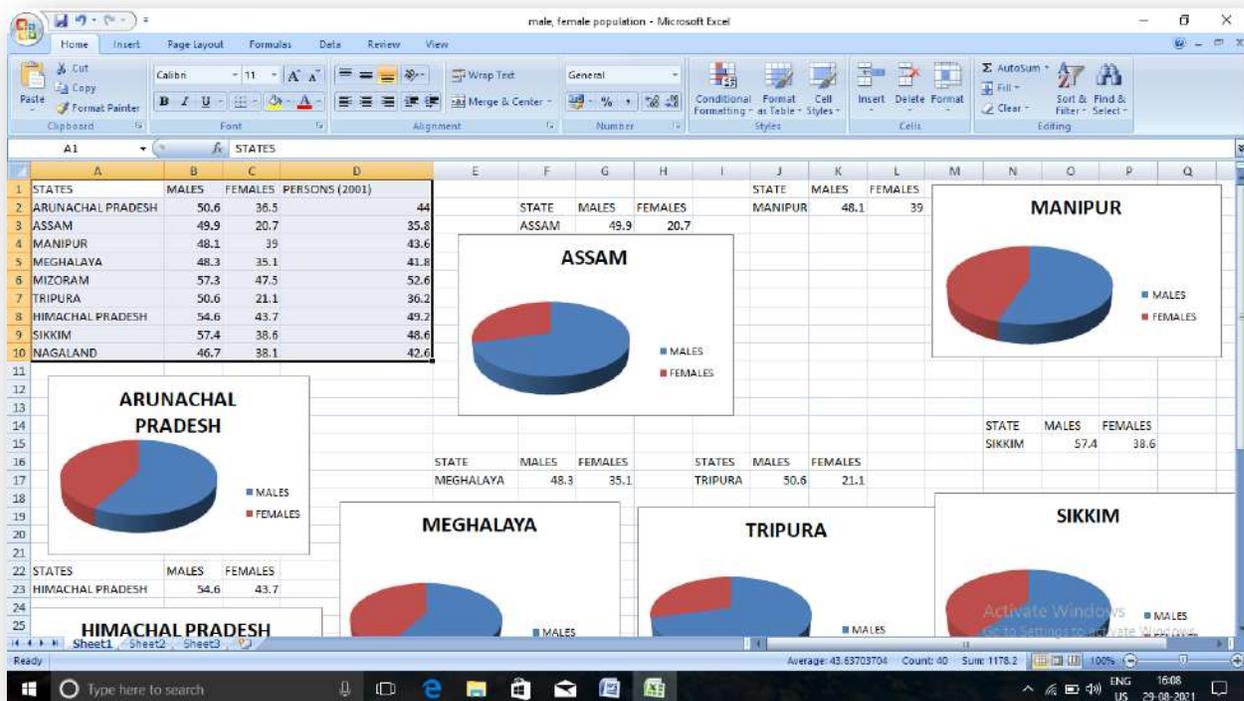
Pull factors are the factors that would attract or encourage the persons to leave their place of origin. These would include better living conditions, job opportunities, enjoyment, better medical care, feeling of having religious or political freedom, education, attractive climates, and better chances of marrying, among others.

Push factors are the factors that could force the persons to move their place of origin. These would include few or not enough job opportunities, inadequate conditions, famine, political fear, poor medical care, desire for freedom, poor housing, condemned housing, war, death threats, and natural disasters, among others.

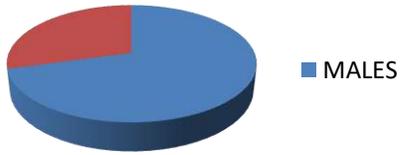
CALCULATION TABLE OF PIE-DIAGRAM

SHOWING

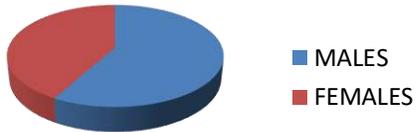
MALE & FEMALE POPULATION



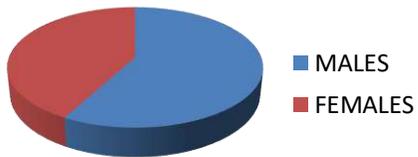
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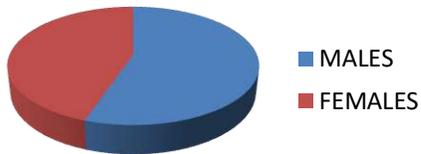
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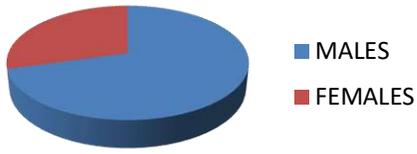
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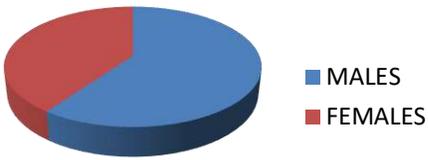
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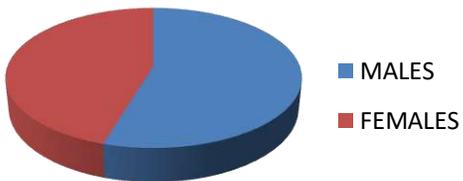
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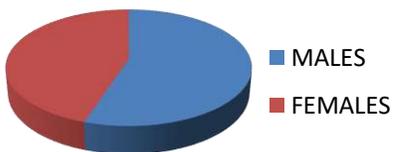
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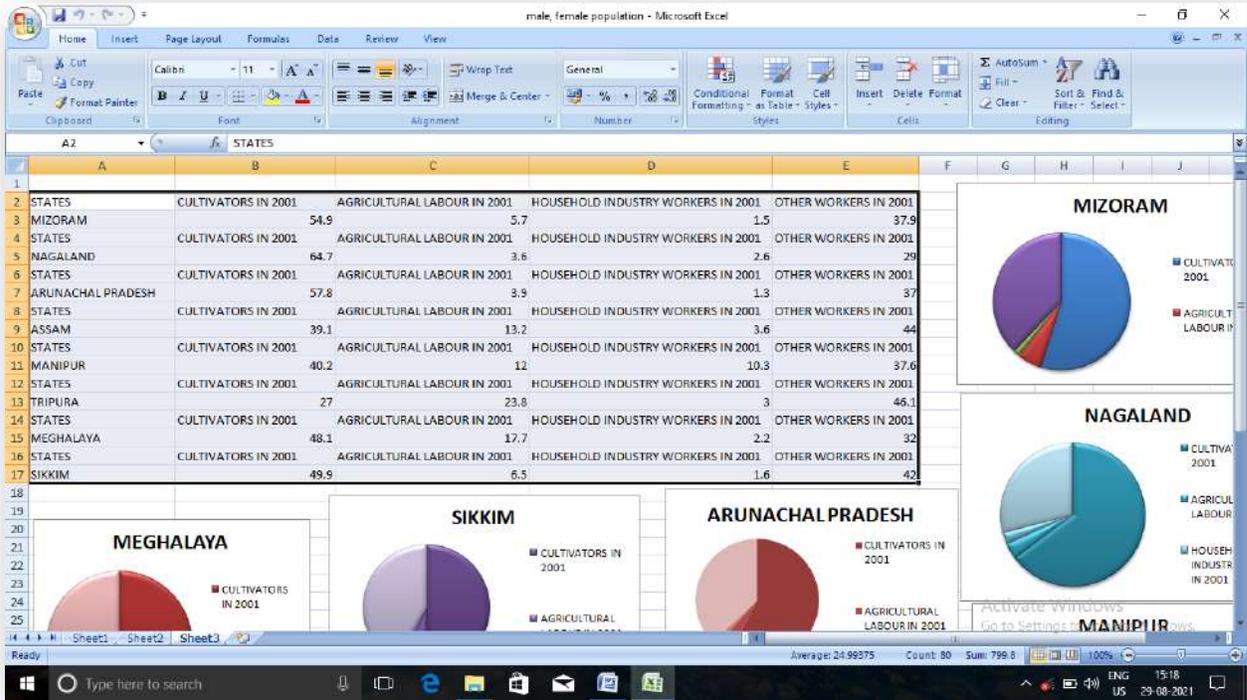
MIZORAM



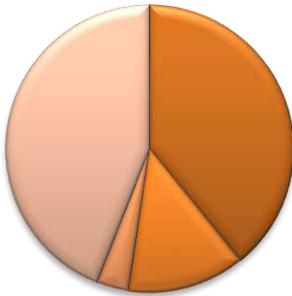
NAGALAND



CALCULATION TABLE OF PIE DIAGRAM

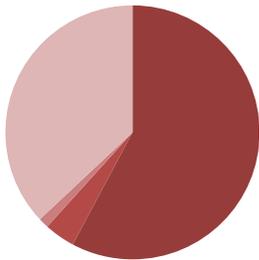


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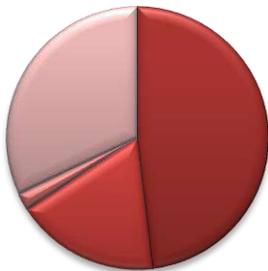
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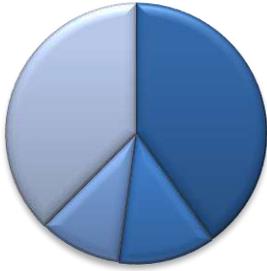
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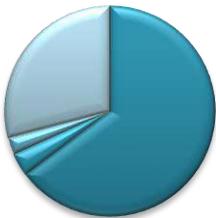
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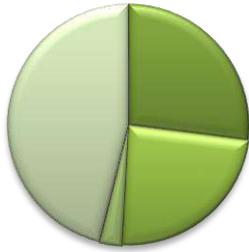
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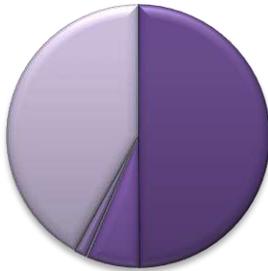
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SIKKIM



- CULTIVATORS IN 2001
- AGRICULTURAL LABOUR IN 2001
- HOUSEHOLD INDUSTRY WORKERS IN 2001
- OTHER WORKERS IN 2001

LAND USE / LAND COVER MAPPING: Land management and land planning requires a knowledge of the current state of the landscape. Understanding current land cover and how it is being used, along with an accurate means of monitoring change over time, is vital to any person responsible for land management. Measuring current conditions and how they are changing can be easily achieved through land cover mapping, a process that quantifies current land resources into a series of thematic categories, such as forest, water, and paved surfaces. By using remotely sensed imagery and semi-automated classification methods, Sanborn provides cost-effective and accurate means to derive land resource information and maintain its currency into the future.

IT IS USED IN: More current, accurate, and cost-effective methods for gathering information about landscape change have become available to users in the fields of urban planning, land management, and natural resource conservation. Sanborn offers three levels of land cover products that can be tailored to meet your project requirements.

WHO BENEFITS FROM LAND COVER MAPPING?

The surface of the Earth is continuously changing at many levels; local, regional, national, and global scales. Changes in land use and land cover are pervasive, rapid, and can have significant impacts for people, the economy, and the environment. Among the organizations that will benefit from the information derived from land cover solutions are:

- Federal, state, city, county government agencies
- Environment and research organizations
- Water districts
- Engineering firms
- Private forestry organizations

What is the difference between land cover and land use? Land cover data documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water. Land use shows how people use the landscape – whether for development, conservation, or mixed uses. The different types of land cover can be managed or used quite differently.

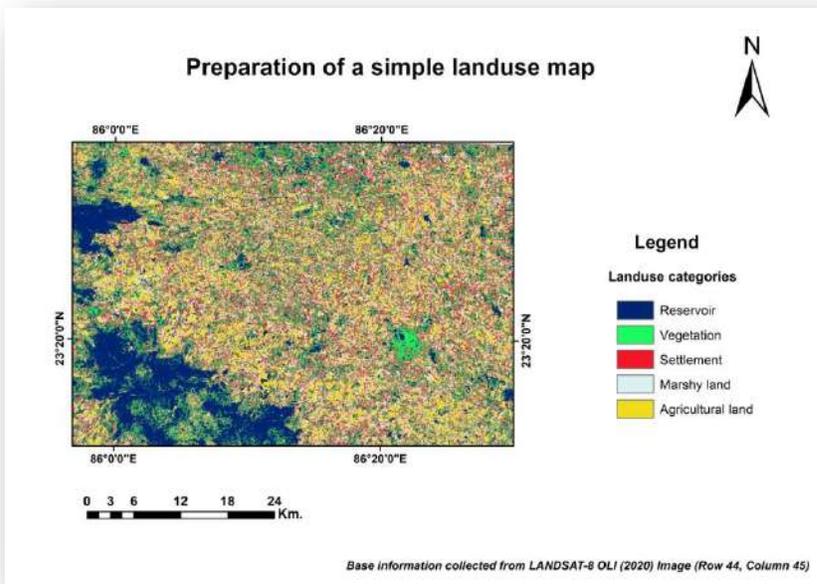
Land cover can be determined by analyzing satellite and aerial imagery. Land use cannot be determined from satellite imagery. Land cover maps provide information to help managers best understand the current landscape. To see change over time, land cover maps for several different years are needed. With this information, managers can evaluate past management decisions as well as gain insight into the possible effects of their current decisions before they are implemented.

Coastal managers use land cover data and maps to better understand the impacts of natural phenomena and human use of the landscape. Maps can help managers assess urban growth, model water quality issues, predict and assess impacts from floods and storm surges, track wetland losses and potential impacts from

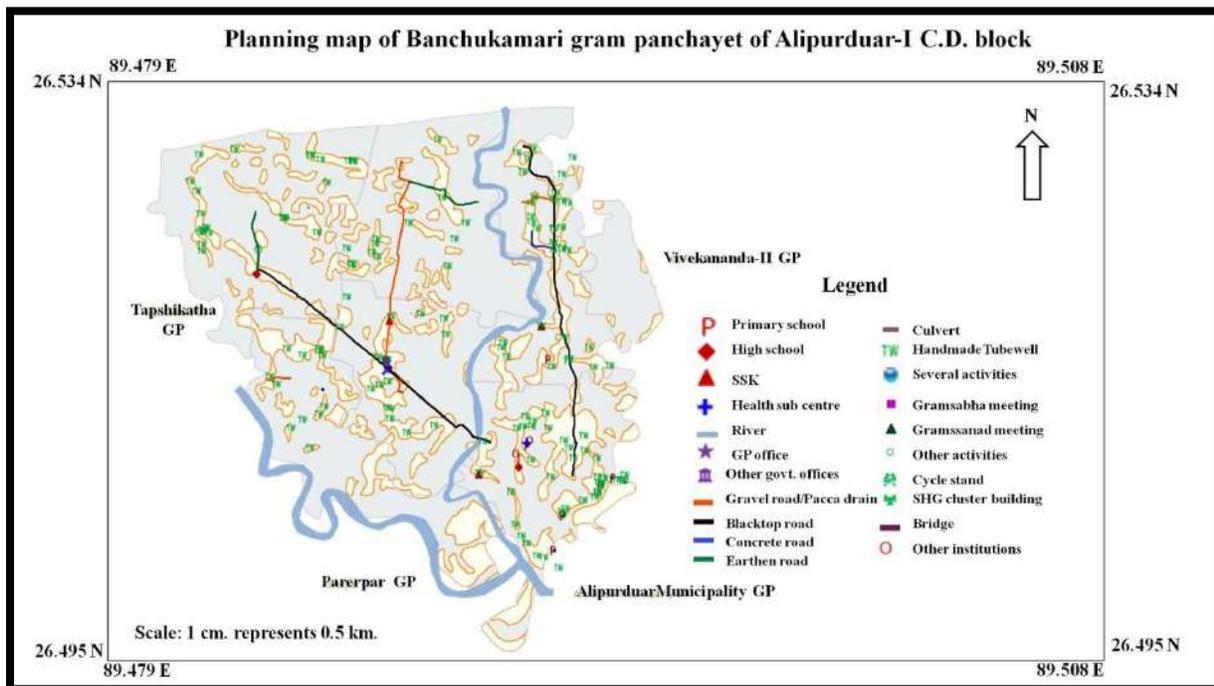
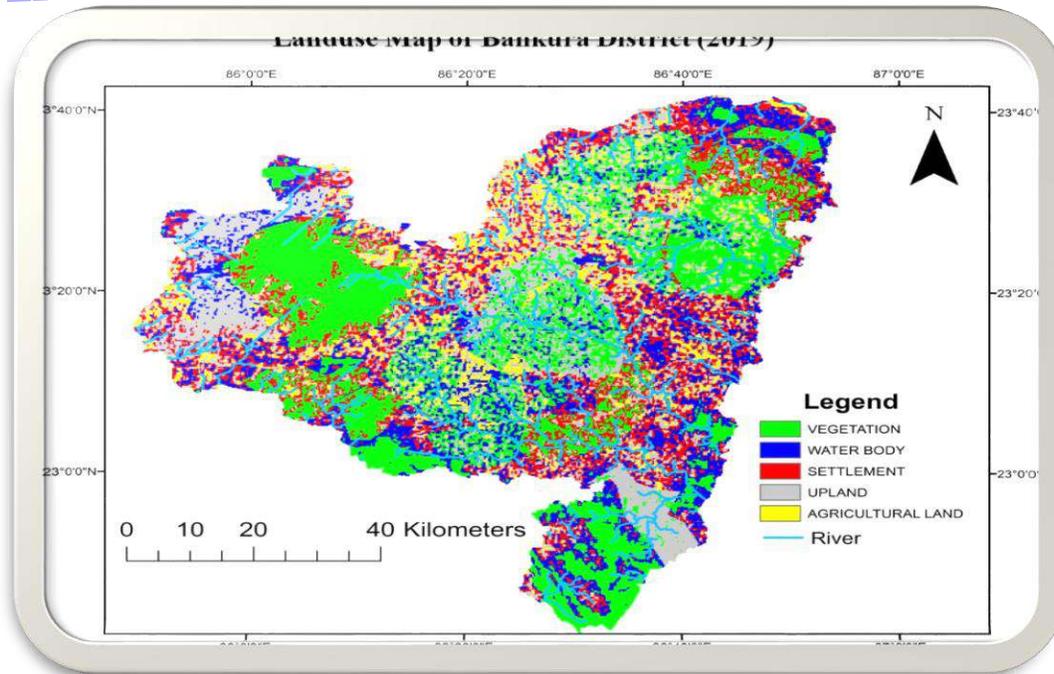
sea level rise, prioritize areas for conservation efforts, and compare land cover changes with effects in the environment or to connections in socioeconomic changes such as increasing population.

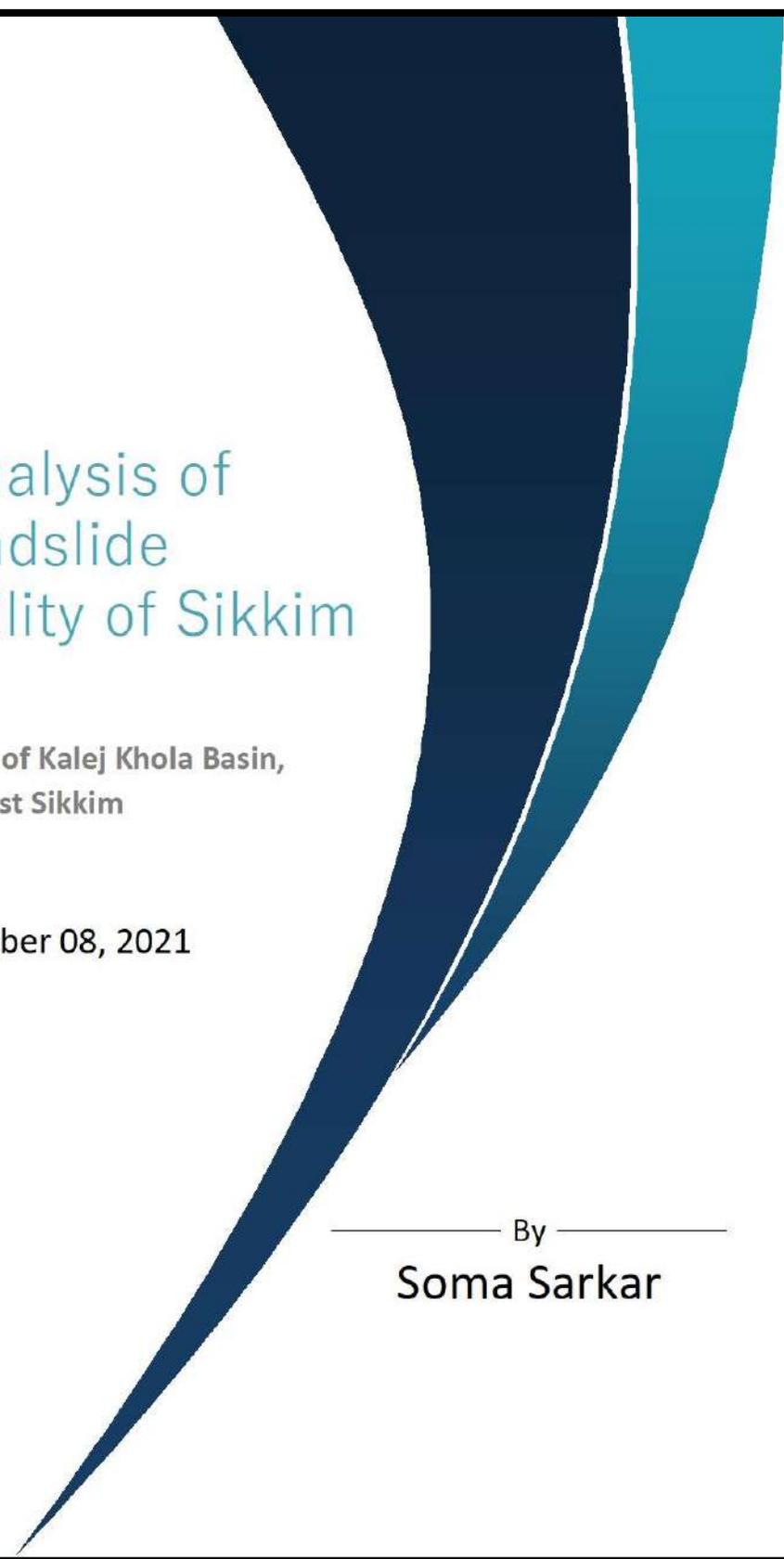
Area of landuse - Microsoft Excel

Rowid	VALUE	COUNT	Area	Landuse_units
0	1	115271	4.349541	Settlement
1	2	406199	15.32753	Reservoir
2	3	554870	20.53749	Vegetation
3	4	660826	24.93554	Marshy Land
4	5	912961	34.44571	Agricultural land
		2650127	100	



LANDUSE MAP OF PURULIA DISTRICT (2019)





An Analysis of Landslide Susceptibility of Sikkim

The case study of Kalej Khola Basin,
West Sikkim

September 08, 2021

By
Soma Sarkar

“An Analysis of Landslide Susceptibility of Sikkim: The Case Study of Kalej Khola Basin, West Sikkim”



SUBMITTED BY:

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Date: 06/09/2021

TO WHOM IT MAY CONCERN

This is to certify that Sri/ Smt Soma Sarkar

Roll No. _____ BGC/MGM/Slv/21 No. 329 _____ of IVth
Semester, M.Sc. in Geography, has completed his/her Dissertation Paper on

***“An Analysis of Landslide Susceptibility of Sikkim: The Case Study of Kalej
Kholā Basin, West Sikkim”***

under the guidance of the undersigned teacher.

Wish him/her Success

Shubhanga Dasgupta

Signature of the Supervisor

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I would like to appreciate everyone who generously gave their time, energy and knowledge in helping me complete my dissertation. Without the contribution of these people the project could not have come to completion.

First and foremost, I would like to express my gratitude to the supervisor, Smt. Shubhanita Dasgupta, for her guidance critical comments and constructive suggestions. I am highly indebted to Sri. Suhel Sen, Faculty, Bhairab Ganguly College, for his whole hearted cooperation and efforts in helping me with me with mapping process and providing me relevant advice throughout the course of my work on **“An Analysis of Landslide Susceptibility of Sikkim: The Case Study of Kalej Khola Basin, West Sikkim”**.

I would also like to extend my gratitude to the Principal Prof. Dr. Subhranil Som and our respected Department In-charge Prof. Madhumita Mandal for providing us with all the facility that was required.

Soma Sarkar

***“An Analysis of Landslide Susceptibility of Sikkim: The Case Study of
Kalej Khola Basin, West Sikkim”.***

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1.INTRODUCTION: -

Geological history of Sikkim has been explored by different geologists in different periods. Sikkim, a small mountainous state in the eastern Himalayas covers an area of 7069 sq. km., extending approximately 114 km from north to south and 64 km east to west. It is also a hilly state consisting of tangled series of interlocking mountain chains rising range above range from the south to the foot of high peaks which marks the snow line in the north. The topography is such that it has earned itself a characteristic feature - the unavoidable natural disaster of all, the landslide. Landslide has thus been a part of this state since its formation. Sikkim is primarily a catchment area of the Teesta Drainage system. The geographical location and the topography of this state makes it vulnerable to landslides. Many efforts have been taken to cope up with this landslide that is unavoidable in the state, but inspite of all these efforts this problem reoccurs, making the life of residents as well as that of the visiting tourists difficult.

The dissertation entitled “Land Slide Susceptibility of Sikkim: The Case Study of Kalej Khola Basin, West Sikkim” studies the landslide problem from a geomorphic perspective. Landslides are significant natural hazards in many parts of the world. Each year they claim more than 100000 deaths and injuries with damage costing more than a 1 billion USD. Generally, landslides are triggered by seismicity or heavy rains but there are so many factors affecting the increased rate of landslide in and around the Geyzing town region. The main factors which are responsible for landslides are – Relief and Geological characteristics of the area, Drainage system, Vegetation cover, and Socio-economic activities of the area.

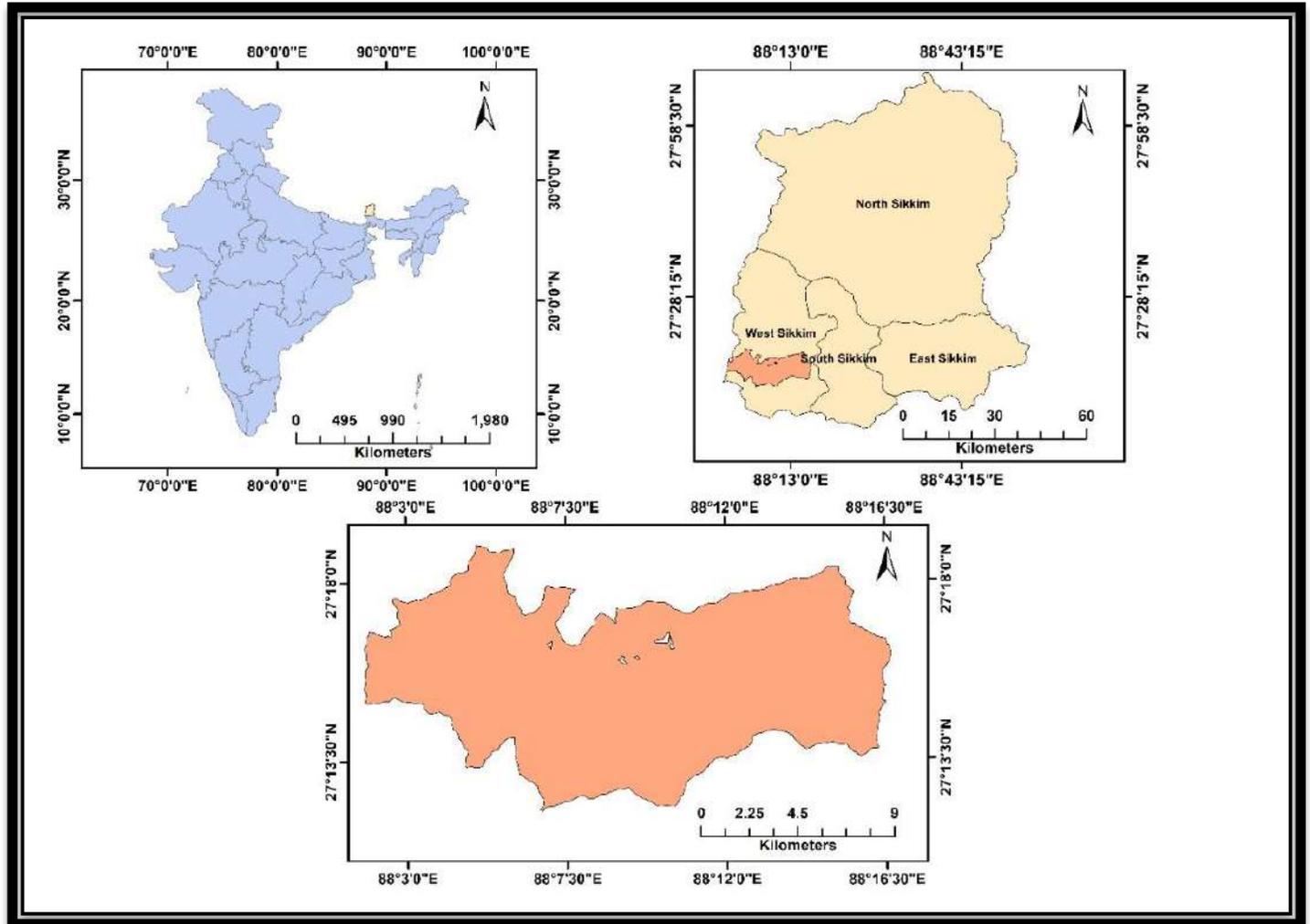
2.STUDY AREA: -

The geographical coordinates of the Kalej Khola basin are 27°16'9.68"N and 88°15'1.70"E.

Geyzing Bazaar is located in Kalej Khola basin of the Indian state of Sikkim. Geographical coordinates of the settlement are 27°17'41.88"N and 88°15'12.31"E.

Kalej Khola originates from 3,898 m peak as Barmo Khola where Yam Khola joins it on the right bank. Along its 34 km traverse in WE direction, it receives water from a number of tributaries on either side. Mardom Khola, Simpok Khola, Simchar Khola, Bega Khola, Dentam Khola, Hi Khola and Rangsang Khola are some of the main streams that join Kalej Khola in this stretch. Kalej Khola ultimately drains into Rangit river on its right bank at 499 m. Rangit river flows 4.2 km up to 460 m where Rayong Khola joins it on the left bank. Further downstream Rishi Khola joins it on the right bank at 421 m. From this confluence downstream Rangit river receives water from Change Khola, Rinchhu Khola and Roathok Khola. Ramam (or Rangbang) Khola is another tributary that joins Rangit river on its right bank. Ramam Khola drains from forested areas through smaller streams like Ribdi Khola, Riyong Khola and Rani Khola. After the confluence of Rani Khola, Ramam Khola flows for another 10.8 km and joins Rangit river.

LOCATION OF STUDY AREA



Map No.1 Location Map of the Study Area

3. LITERATURE REVIEW

Literature review for the study can be divided into conception development regarding landslide susceptibility studies done so far and an information-based appraisal of the study area's geomorphology.

The susceptibility of a given area to landslides can be determined and depicted using hazard zonation. A landslide hazard map can be prepared early in the planning study and developed in more detail as the study progresses. It can be used as a tool to help identify land areas best suited for development by examining the potential risk of landsliding. Furthermore, once landslide susceptibility is identified, investment projects can be developed which avoid, prevent, or substantially mitigate the hazard. Determining the extent of landslide hazard requires identifying those areas which could be affected by a damaging landslide and assessing the probability of the landslide occurring within some time period. In general, however, specifying a time frame for the occurrence of a landslide is difficult to determine even under ideal conditions. As a result, landslide hazard is often represented by landslide susceptibility (Brabb, 1985). Landslide hazard zonation (LHZ) is the classification of a land surface into homogeneous areas or domains and their ranking according to degrees of actual hazard caused by mass movement (Varnes 1984). Drainage morphometric analysis has helped to decipher information relating to the form, geomorphic and hydrologic processes of the watersheds. Linear aspects of the basins are related to the channel patterns of the drainage network wherein the topological characteristics of the stream segments in terms of open links of the network system are analyzed. The study of linear aspect includes the analysis of stream order, stream number, bifurcation ratio, stream lengths and length ratio. Areal aspects express the overall plan form and dimensions of drainage basins. The areal aspects considered for the present study include areal extent, length, shape, drainage density, stream frequency and length of overland flow (A. Prabhakaran. Jawahar Raj, 2018). With the help of geospatial techniques, identification and appraisal of landslides in even remote areas of mountain ranges like the Himalayas is rendered possible and delineating landslide vulnerable zones on the basis of major causative factors has been made easy (Anbalagan et al. 2014). Interpretation of future landslide occurrence requires an understanding of conditions and processes controlling landslides in the study area. Three physical factors-past history, slope steepness, and bedrock-are the minimum components necessary to assess landslide hazards. It is also desirable to add a hydrologic factor to reflect the important role which ground water often plays in the occurrence of landslides. An indication of this factor is usually obtained indirectly by looking at vegetation, slope orientation, or precipitation zones (D.C. 1991). The direction of slope directly influences land slide hazard because the direction a slope faces with respect to the sun (aspect) has a profound influence on vegetation, snowpack and construction (GIS Geography, 2021). Landslide hazard zonation mapping is a significant step of knowledge building which is prerequisite of any comprehensive landslide assessment management, disaster mitigation and further resilience building. The scope of landslide vulnerability assessment study is interdisciplinary and based on spatio-temporal

information easily derivable from remote sensing but remains incomplete without being integrated with detailed empirical validation (Pandey et al. 2008). The state of Uttarakhand (India) has got a history full of landslides related events. Memories of major landslides that have caused large-scale human tragedies, material damage and associated environmental and social hazards in Garhwal Himalaya can be traced. The landslides killed about 220 people in the entire rainy season of 2010, where 65 lives were lost, 6 persons went missing, 21 people were injured, 84 livestock died, 534 houses were fully damaged and 2138 houses were partially damaged due to heavy precipitation within 4 days from 18 to 21 September 2010, which virtually brought Uttarakhand to a grinding halt for several days (SEOC report, 2010). The strategy of landslide analyses includes understanding the process, hazard analysis and prediction in order to reduce the impending damages caused. Studies involve generation of landslide inventories, collecting relevant factor information and mapping, exploratory statistical analysis, selection of final factor map generation. Landslide susceptibility studies can be done by various methods, of which four methods are favoured: deterministic, inventory-based probabilistic, heuristic and statistical techniques (Guzzetti et al. 1999).

The mountainous terrain in the Sikkim Himalaya, it faces frequent and number of hazards and disasters which are most vulnerable for society and environment. the land slide susceptibility map has best possible measures of the development perspectives for the micro-watersheds, because in the present system of development micro-level policy making and subsequent reorganization proved the best way of micro-level development planning (Sandipan,2016).

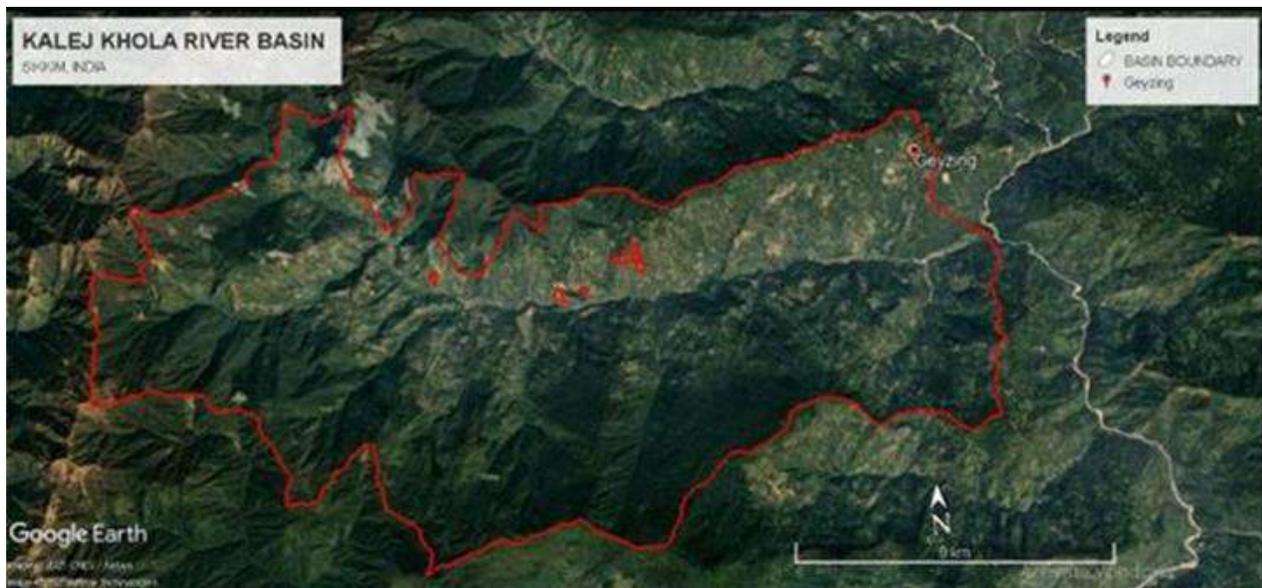
4. AIM AND OBJECTIVES OF THE STUDY: -

The aim of this paper is to analyze the factors responsible for vulnerability of this area to slope failure with an emphasis on the anthropogenic effect in this terrain.

OBJECTIVES:

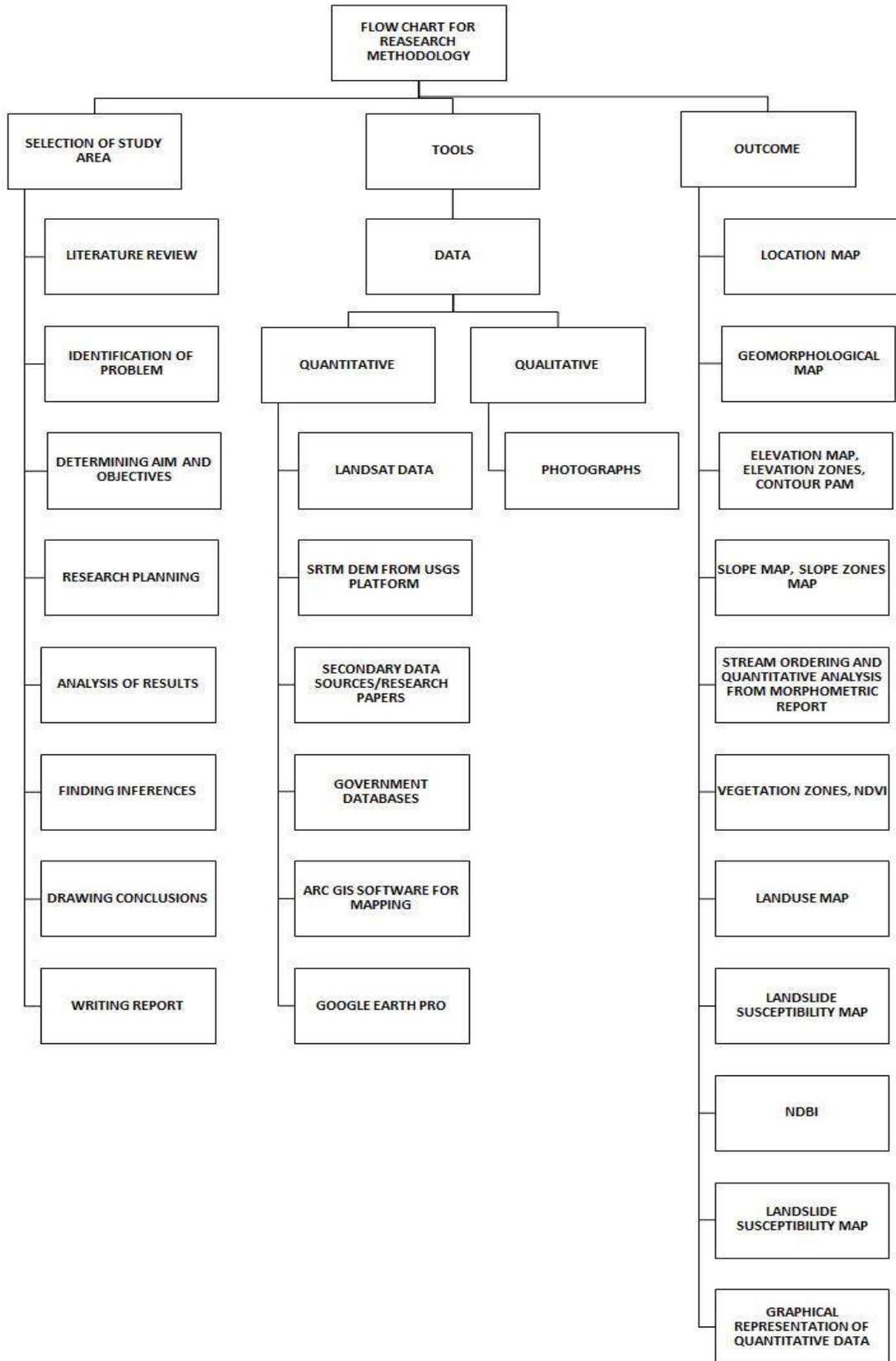
The study has been based on the following objectives, in order to fulfil the above aim:

- i) Study the physiographic characteristics of the area, especially, the steepness of the gradient, variation of elevation throughout the basin and the nature of dissection of topography.
- ii) Study the relationship of the relief with the drainage characteristics of the area, especially the length, number and order of streams, the Bifurcation Ratio and Circularity Ratio of the basins.
- iii) Understand the nature and degree of slope angle and also the aspect of the slope to find out its relationship with increased insolation and precipitation, and hence possibility of slope failure.
- iv) Understand the nature and amount of vegetation in the area and its role in protecting the area from slope failure and checking surface runoff.
- v) Study the nature of landuse with respect to cultivation, transportation and settlement, especially along the left bank.
- vi) Preparation of landslide susceptibility map using physical parameters like relief, drainage, slope and vegetation and find out the relationship between past landslide occurrences and landuse through maps.
- vii) Comment on the nature of vulnerability of the region in future.



Map No 2. The Demarcated Basin in Google Earth

5.METHODOLOGY



6.RESULTS AND DISCUSSION: -

6.1CLIMATIC CHARACTERISTICS OF KALEJ KHOLA BASIN: -

The Kalej Khola basin lies in the regime of monsoon climate of the subtropical and temperate belts. It enjoys heavy number rainfall, winter drought, moderate humidity and relatively low temperature during a year. This basin shows marked spatial variation in the climatic pattern primarily because of-

- (i) Its location and physiography
- (ii) Seasonal change in pressure condition
- (iii) The tropical oceanic air mass of S-W monsoon
- (iv) Flow of local mountain valley wind
- (v) Presence of numerous streams in all the geomorphic divisions.

A. Temperature Condition:

The Kalej Khola basin has diversified climatic characteristics with few contrasts of temperature condition. Here, generally, the physiographical features decide the variation of temperate conditions of this rugged mountainous terrain.

From the general observation of climate and weather condition of the graph (Fig No.), it is found that the average annual temperature of the basin is 20°C within a range of 5°C to 28°C throughout the year. The highest temperature rises above 29°C in the eastern portion of this basin (at Legship) in the summer season and lowest temperature drops below 7°C in the western portion of the basin

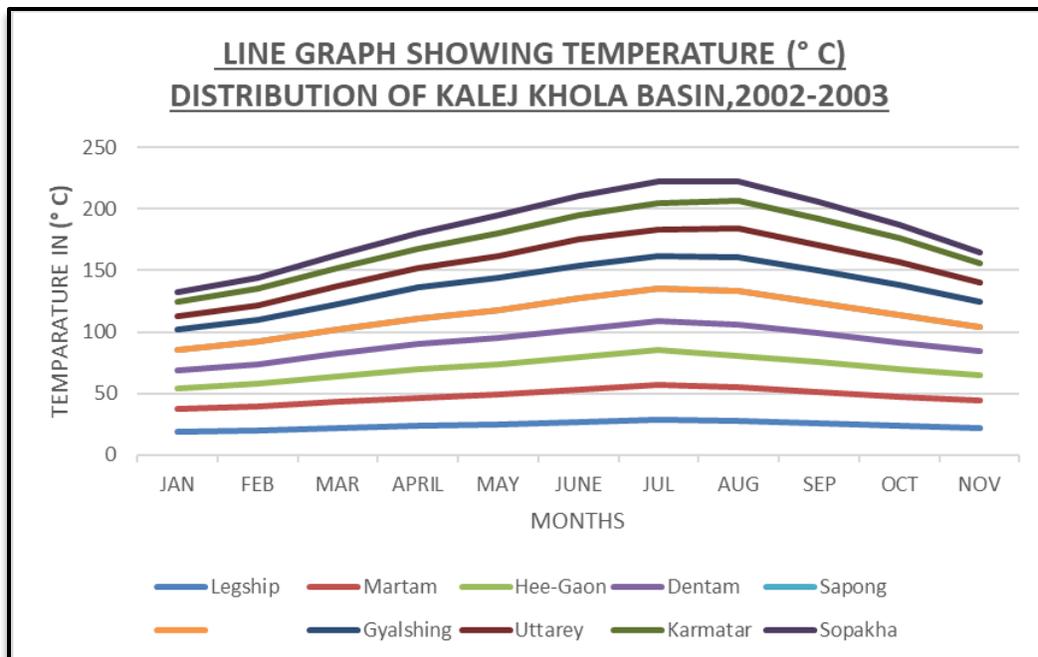


Fig No1.
Temperature
Distribution of
Kalej Khola Basin

(at Sopakha) in the winter season where the altitudes are below 550m and above 2500m respectively.

B. Precipitation/Rainfall Condition:

Generally, precipitation occurs in the monsoon season i.e. from June to September in this basin. The average precipitation (normally, rainfall) ranges between 350mm to 650mm per month in this period from the incoming S-W moist monsoon bearing clouds in the valley of Kalej Khola. Rainfall gradually increases towards the northern and southern marginal ridges and south-western high-altitude areas of this basin except few stations of the lower altitude areas. South-western portion of this basin (near Uttarey) receives the maximum precipitation as rainfall in monsoon season and some stations of the western portion of Kalej Khola basin (Kanchanjungha belt) and the high altitude northern and southern ridge portions face frequent winter precipitation as snowfall occurring during December to February. Post monsoon rainfall also frequently found in the eastern and central portions of this basin in the month of October and November. But, almost dry condition or least precipitation is found in the winter over the central and eastern portions of this basin from November to February. The rate of precipitation falls below 50mm per month in this season. According to variation of precipitation rate with varying season the entire annual period can be divided into two phases. (i) Wet Phase (generally warm and humid months) (ii) Xeric Phase (generally cold and dry months). Humidity decreases with the full onset of winter. The intense isolation in the mountain slopes occurs due to rapid heating of the mountain slope. This upslope breeze is called the anabatic wind. This is sometimes accompanied by the formation cumulus cloud cover near mountain scarps and sloping faces. Occasional thunder splashes are very common in the high land - areas during pre-monsoon and monsoon months. The rain is mostly of orographic type occurring in the northern southern marginal highlands and south-western greatly dissected lands.

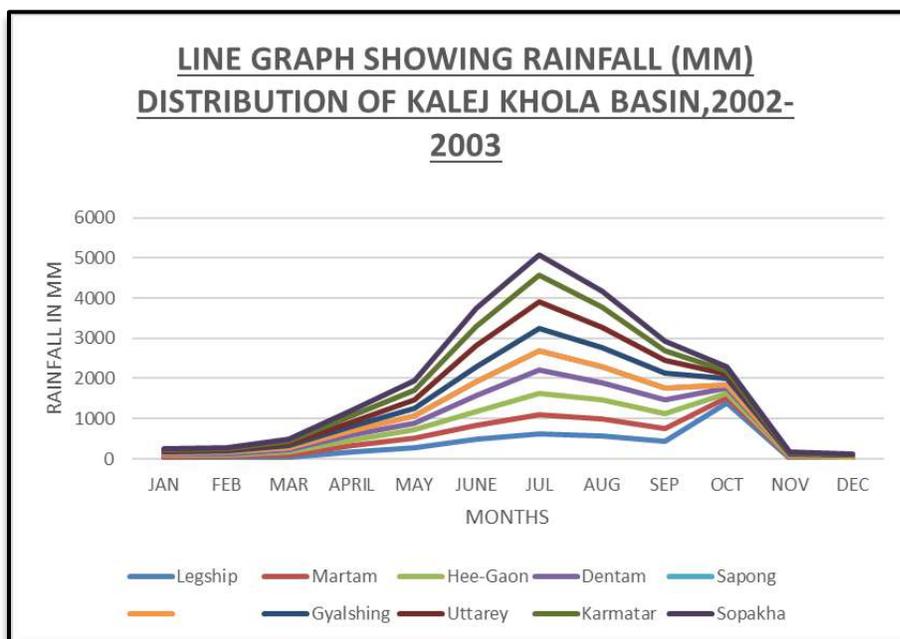


Fig No 2. Rainfall Distribution of Kalej Khola Basin

Natural radiation brings about a more rapid cooling of mountain slopes. At night temperature decreases resulting in cooling of the river valleys by the down moving katabatic wind. The cold wind is experienced in the low areas and produces fogs during post-monsoon and winter seasons.

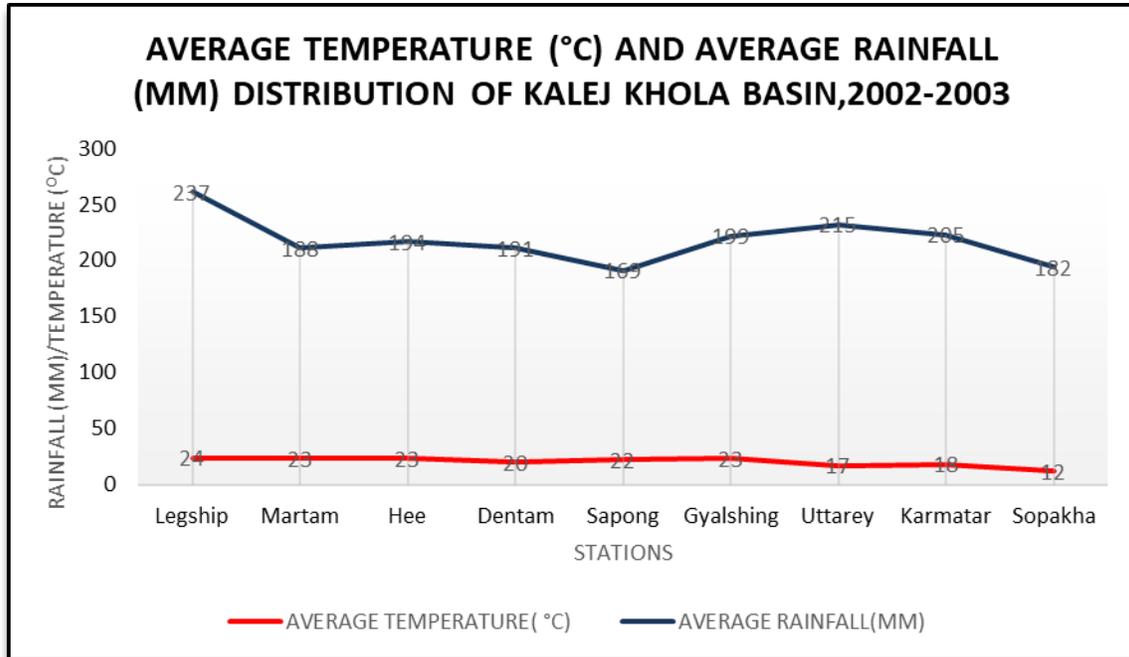


Fig No 3. Average Temperature and Rainfall Trend of Kalej Khola Basin

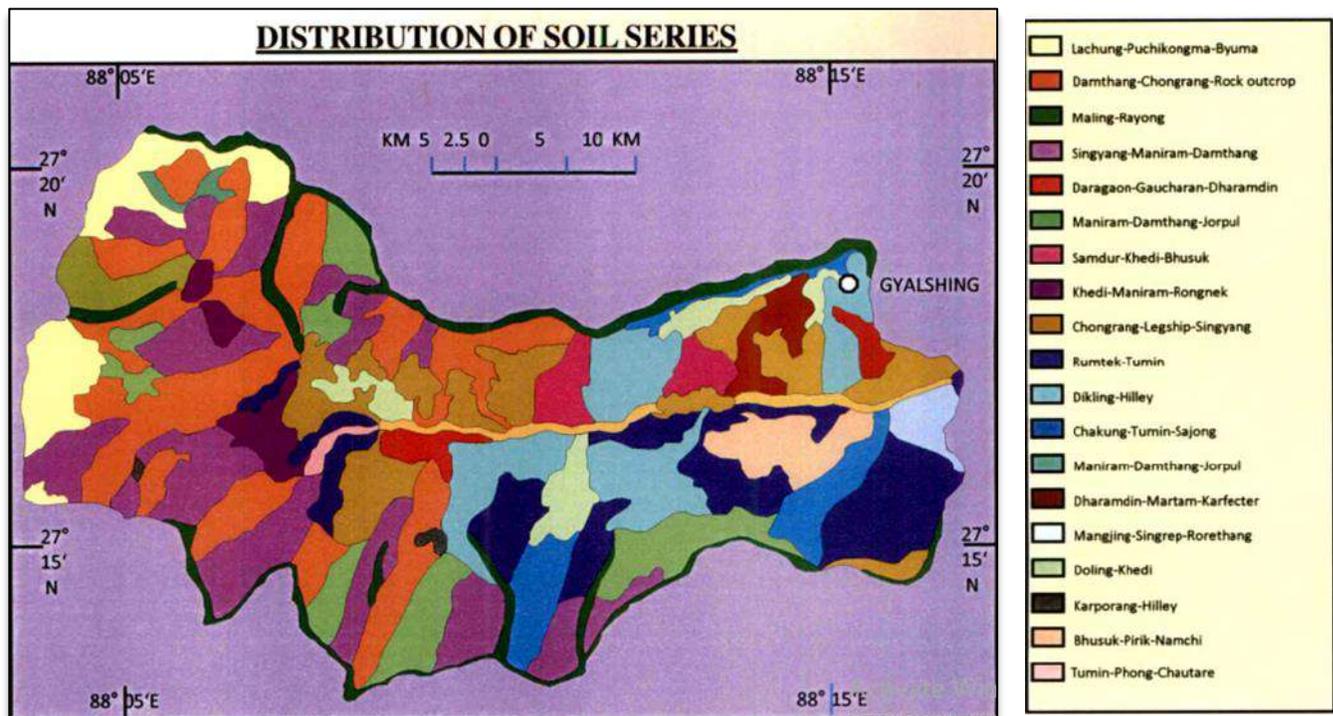
The chart has been prepared for some selected stations over the entire basin from the collected data on rainfall and temperature showing the two distinct phases of wet and xeric (Fig. No. 2). From the intensive observation of the charts of the selected stations (like Legship, Gyalshing, Dentam, Uttarey, Sopakha etc.) of Kalej Khola basin, it is very clear almost all the stations are dominated by the wet phases. It is also found that the dominance of wet phases gradually increases towards the western portion of the basin. Thus, it is clear that the climatic condition varies in western part of the basin from the eastern which influences the types and distributional patterns of natural vegetation and simultaneously soil characteristics and related land potentiality.

The Kalej Khola basin is characterized by moderate range of temperature from east to west and from Kalej river valley towards north and south marginal highlands. In summer season, mean temperature is 25°C (June) and in winter season mean temperature is 8°C (January). Occasional Norwesters, moderate degree of diurnal range of temperature and relative humidity especially in the eastern part, southwestern and south-eastern parts are common in this basin. Rainfall record shows slight variations in Pre-monsoon. Monsoon and Post-monsoon respectively and primarily associated with Easterly Jet-stream in S-W monsoon season.

6.2 SOIL AND GEOLOGY OF KALEJ KHOLA BASIN: -

Climatic condition has influenced the soil formation and natural vegetation cover of the Kalej Khola basin. The thick forest cover on different soil cover in this moist climatic region is really applicable for the term 'organic region'. Soil is the part of land as well as the basic determinant of land potentiality. It is the vital life supporting element of land. All living beings are dependent on soil. The word 'Soil' has been used in a broad and ecologically justifiable sense to include any part of earth's crust in which plants are anchored. According to 'NiMforofT (1965) "The pedogenic process is never finished, therefore, soil is merely a manifestation of its operation, rather than a result'.

From geological point of view, soils are developed by weathered sedimentary and metamorphic rocks such as sand stone, shale, schist etc. They have developed along both sides of Kalej Khola and its tributaries in different rate. The soils have developed on the Quaternary deposits of the fluvial terraces and upland slopes with different thickness within this sub-tropical environment.



Map No 3. Distribution of Soil Series

(Source:<https://shodhganga.inflibnet.ac.in/handle/10603/156739>)

In the humid tropical and sub-tropical areas, organic decay due to high rate of micro-biological activity results in the rapid break down of natural and synthesized organic complexes and therefore, a rapid burning up of organic matter. Hyper solution process acts upon the decompositional products of the layer which are thereafter translocated to the underline minerals

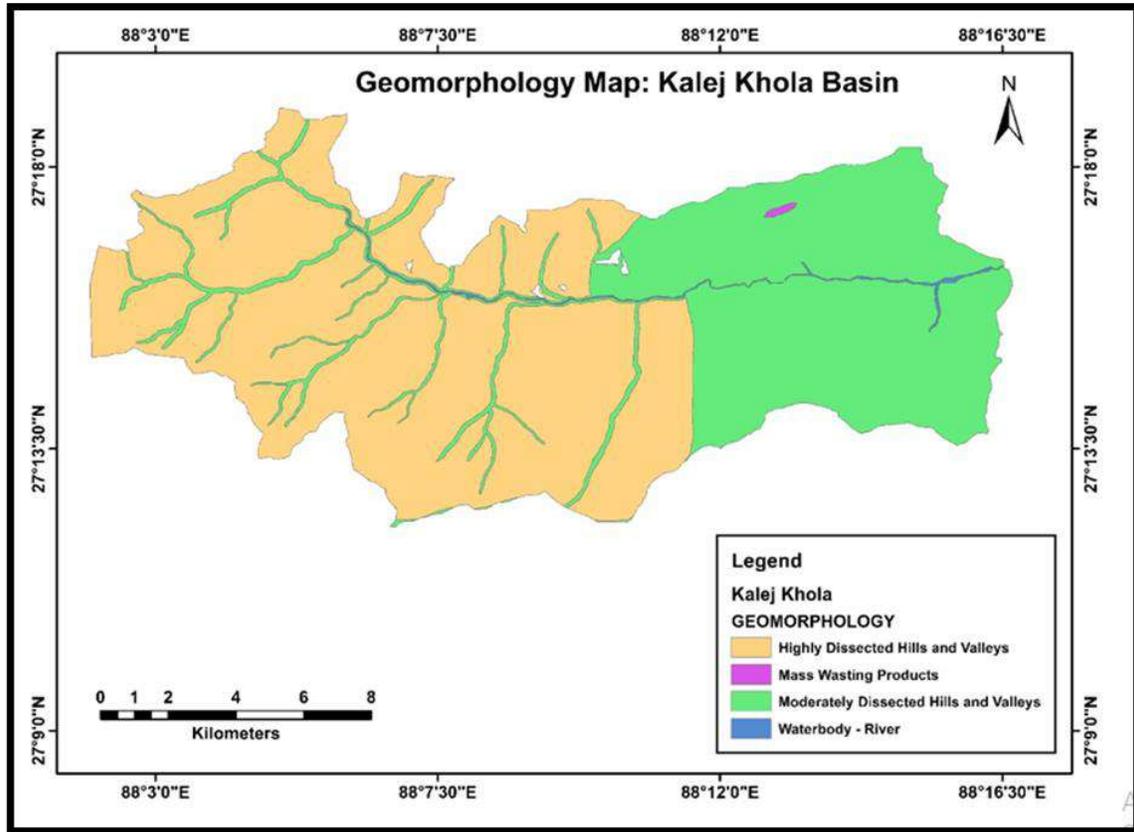
by percolating water. Acid and bases react with the mineral constituents in the elevated layer. The sediment under consideration in Kalej Khola basin are of transported and deposited with heterogeneous parent materials in which the uppermost 'A' layer is made up of moderate fine materials with slight mixture of coarser sand and pebbles of the underlying layers. More over low ratio of alkali and alkali based to alumina in classic rocks as compared to igneous/metamorphic rocks is not conducive to the formation of clay minerals in the zones of eluviation. Also, rapid decay of organic matter leads to minor clay content in the "A" horizon thereby inhabiting the formation of organic colloids which could lead to the formation of impervious layer. Moreover, low ground water conditions contribute to the free access of percolating water to great depths thereby forming very deep weathered soil profiles. Thus, with time a greater depth of oxidation is achieved, leading to the orange- and brick-coloured sediments. For geological purpose, the colour of weathering zones may be sequentially arranged in order to superposition as follows: 1. Unoxidised weathering zone 2. Light grey coloured weathering zone 3. Yellow coloured weathering zone 4. Orange coloured weathering zone 5. Brick red coloured weathering zone 6. Dark grey coloured weathering zone.

6.2.1. GEOLOGICAL CHARACTERISTICS OF SIKKIM:

Most of the occurrences are in Daling Group of rocks in parts of West, South and East districts of Sikkim. Base metal occurrences at Bhotang, Pachekhoni and Dikchu have been explored in details. Among non-metallic minerals coal, graphite, dolomite, limestone, marble, wollastonite, talc, sillimanite and asbestos etc. also occur (Source: http://www.sikervis.nic.in/Database/GSI_4420.aspx). The quartzite occurrence at Ranikhola - Mansari area of West Sikkim was mined commercially, and the mine is being considered for revival. Estimated mineable reserve of some 70,000 tonnes at the area lies unexploited. Talc in Sikkim has been found as intercalations in quartzite deposit of Ranikhola - Mansari area of West Sikkim. Graphite in Sikkim occurs over parts of West and North Districts. Workable occurrences are located at Chitre - Dariely & Dentam - Uttarey area of West Sikkim. The graphite is made up of 40 - 60 % fixed carbon. Beneficiation is necessary for commercial exploitation. (Source: <https://sikkim.gov.in/departments/mines-minerals-and-geology/mineral-reserves>). The series augen bearing biotite gneiss, mica schist beds and series of biotite quartzite slate beds are found with massive extension in western, central and eastern parts respectively. These are two major formations here. The series of garnet kyanite, biotite schist, garnetiferous mica schist, gneissic quartzite is seen here as narrow, elongated their stretches following the micro and meso faulting and thrusting zones in the central, northern and south-western parts crossing over the Kalej Khola and some small tributaries. The granite mass having mixture of gneiss has been appeared in the transitional zone of two major series of formations across Kalej Khola in convex shape in western direction. The other series of formations are found as comparative small patches in different parts of this basin significantly. Such as ortho-quartzite, pyritiferous black slate, biotite phyllite/mica schist series and syenite with dyke and sill formations are found significantly in the south-eastern part of the basin as elongated few narrow patches.

6.3. MORPHOLOGICAL CHARACTERISTICS OF KALEJ KHOLA BASIN: -

In connection with the regional geomorphology and land potentiality of Kalej Khola basin it is necessary to identify the inherited fluvial landforms developed under different climatic conditions of the past. Regarding the exogenetic forces climate plays a vital role in determination at present riverine features relating to the present cycle of erosion of the study area. The Kalej Khola basin is a cumulative function of both endogenetic and exogenetic processes.



Map No 5. Geomorphology of Kalej Khola

Distributional pattern and variation of natural vegetation of this basin is influenced by the variation in the elements of climate like temperature, rainfall, humidity etc. on diversified terrain of this fluvial environment.

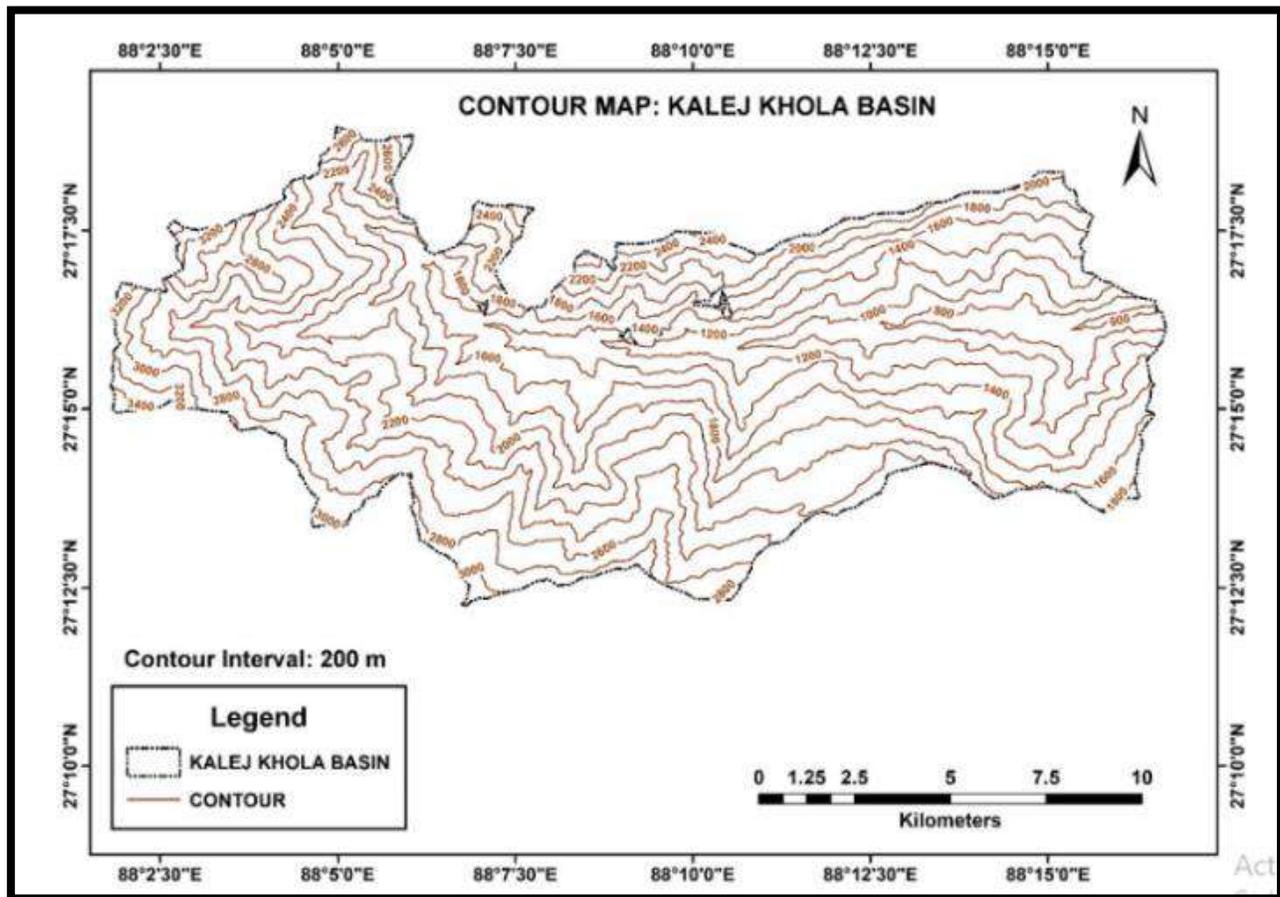
Kalej Khola Basin is a hilly area which has highly dissected hills and valleys on the western part of the basin (Map No 5) and moderately dissected hills and valleys on the eastern part of the basin. A number of swift-flowing streams of short course move downslope from the steep slopes to the right of the basin. This area is mass-wasting prone too and loose and unconsolidated debris are the main mass-wasting products here.

6.4. RELIEF ASPECT OF THE KALEJ KHOLA BASIN: -

Terrain elevation is an important factor to identify other factor impacts of this landslide-prone area.

Relief Analysis through Contours:

Geyzing region is north-eastern part of Kalej Khola basin area which is farther connected with Rongpo River. The relief of this particular basin area is high to low from west to east and north to south. The contours, especially in the northern, north-eastern and western part of the town show a close spacing indicating steepness of the terrain. The presence of a ridge in the northern and north-eastern part, and escarpment in the western part is clearly seen from the arrangement of contours (Map No 6.). The Contour Map shows that the maximum contour value is 3600m which is located in the western part of this basin area and decreases (by 200m interval) towards east and the least contour value is in eastern part of the area that is 566m. it shows the variation of the height of Kalej Khola basin the as well as we can see that the drainage pattern of this area by the contour map of the area. Geyzing is a market town located in the north-eastern part of Kalej Khola basin. Height of the Geyzing market is approximately 1400m to 1800m. Contours are evenly spaced in southern and eastern part indicating the presence of a uniform slope here, whereas the concentrated



Map No 6. Contour Map, Kalej Khola Basin

closely-spaced contours in north and western part of this basin indicate presence of steep slopes. It is notable that the altitudinal range from the ridge towards the left bank of Kalej Khola is approximately 2400 metres, whereas that of the right bank is 1800 metres, i.e., much lesser than that of the left bank. But the typical contour spacing from the ridge towards the right bank ensures that the decrease of altitude from 2400 metres to 600 metres takes place over a much shorter distance. The Relative Relief (RR) of Kalej Khola basin is 2800m. (following Smith's method, 1935)

High values of relative relief indicate a rugged terrain, whereas low values of relative relief indicate that the relief is almost featureless. The average RR is approximately 900 metres. The map shows that the area around the Geyzing market has steep slope, which indicates that the RR is also high. The values rise (at an interval of 200m) towards the north and decrease southern part of the market-town. This indicates that the terrain of Geyzing is rugged due to the presence of rocky knobs, outcrops and escarpments (Figure 10).

Relative Relief (in meter) = Maximum Contour Value -Minimum Contour Value of the Area. (After Smith, 1935). Relative Relief of Kalej Khola basin= 3600 m – 566m = 3034m.

Basin Relief Characteristics

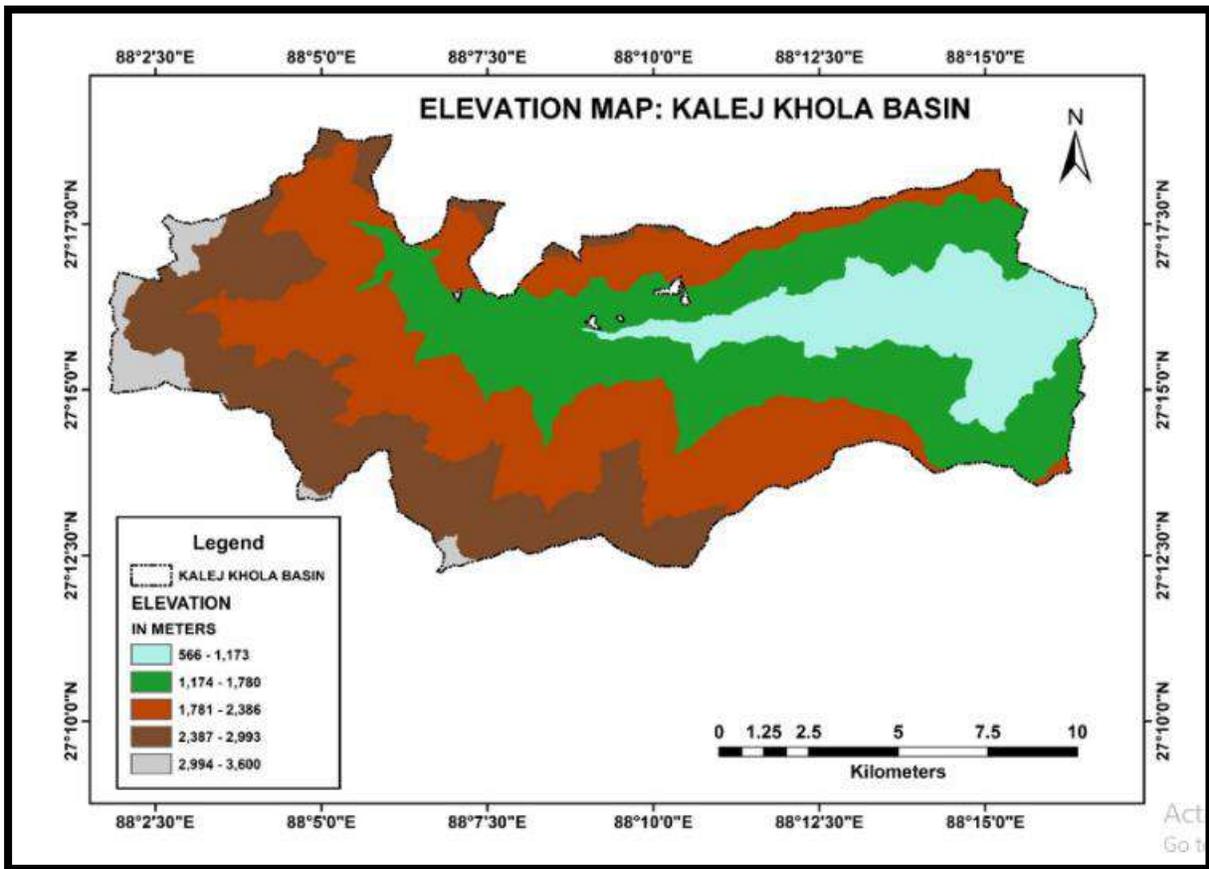
Relief Ratio	0.12528231052
Relative Relief Ratio	3.36332317295
Gradient Ratio	0.12528231052
Ruggedness Number	2.81143838021
Melton Ruggedness Number	229.217296797
Modified Melton Ruggedness Number	213.459427382
Terrain Undulation Index	1.15309235526

Using Elevation Map and Elevation Zonation Map for Relief Analysis: -

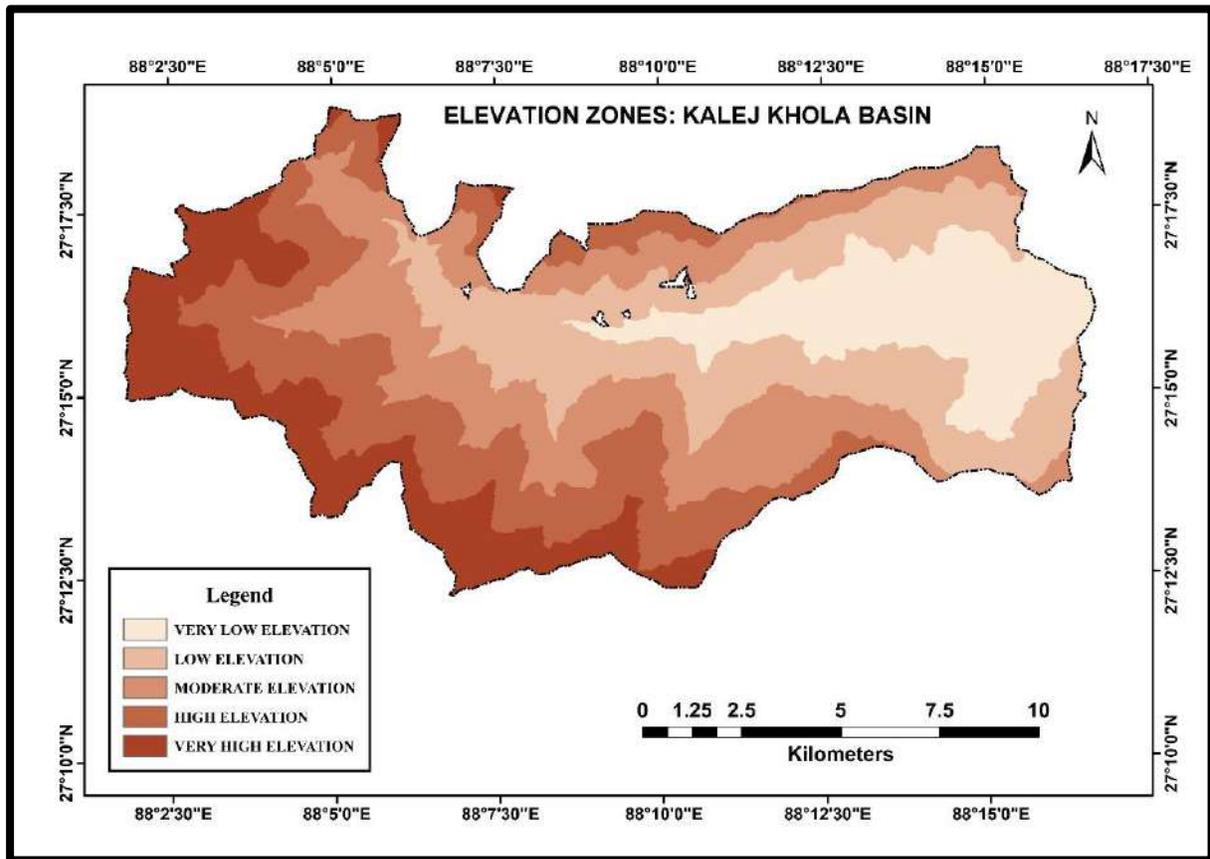
The variation of contour value is reflected in the elevation of that area which is represented in Elevation Map (Map.no 2). The elevation map of Kalej Khola basin depicts the relief characteristics with the help of contour values drawn at interval of approximately 600 metres. The mean elevation is 2084 metres above sea level. The area occupying the Kalej Khola Valley, in the eastern part of the basin, has low elevation ranging between 566 and 1173 meters. Here the altitudinal range is 607 metres, indicating that the valley is deeply incised. This area is marked with blue colour in the map. The next zone which surrounds this region of low elevation has elevation varying between 1174 and 1780 metres, indicated by green colour. This is followed with a light brown coloured area of relatively moderate elevation varying between 1781 and 2386 metres. This area is mostly present in the northern and central part of the basin. Elevation increases

to range between 2387 and 2993 metres in the extreme northern, western, south western and southern part of the basin, indicated by dark brown colour. The highest point is the eastern part of this basin with an elevation of 2994-3600 metres in the extreme western margin of the basin.

On the basis of Elevation Map an Elevation Zonation Map (Map.no7) on Kalej Khola basin which shows five different elevation zones in this small basin. Geyzing market is located in north eastern part of this basin and its elevation variation of approximately 1174 to 2386 which is ideal for landslide due to its steepness of relief. If any natural phenomena which instigates the land slide processes like cloud burst rain storm occurs in Kalej Khola basin area then mass-wasted materials move from high elevation to low elevation zone. The location of Geyzing Town is ideal for such processes due to relief factor and if other factors are present, this area will be identified as being susceptible to landslides.



Map No 7. Elevation Map: Kalej Khola Basin



Map No 8. Elevation Zones: Kalej Khola Basin

6.5. SLOPE AND ASPECT OF KALEJ KHOLA BASIN:

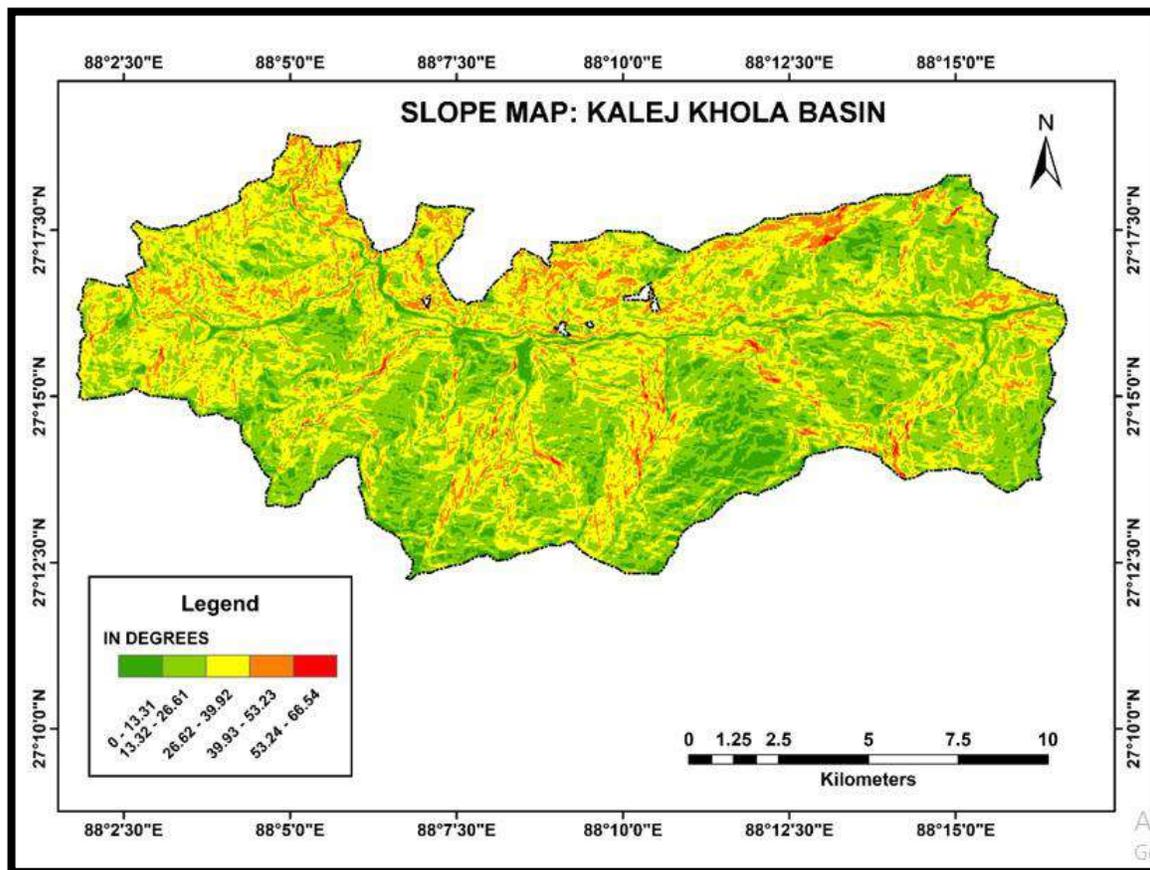
Slope is the most basic parameter for stability considerations, especially in mountains, as with increase in slope, shear stress of basal material increases in direct proportion (Lee et al. 2004).

Analysis of Slope with the help of Slope Map and Slope Zonation Map: -

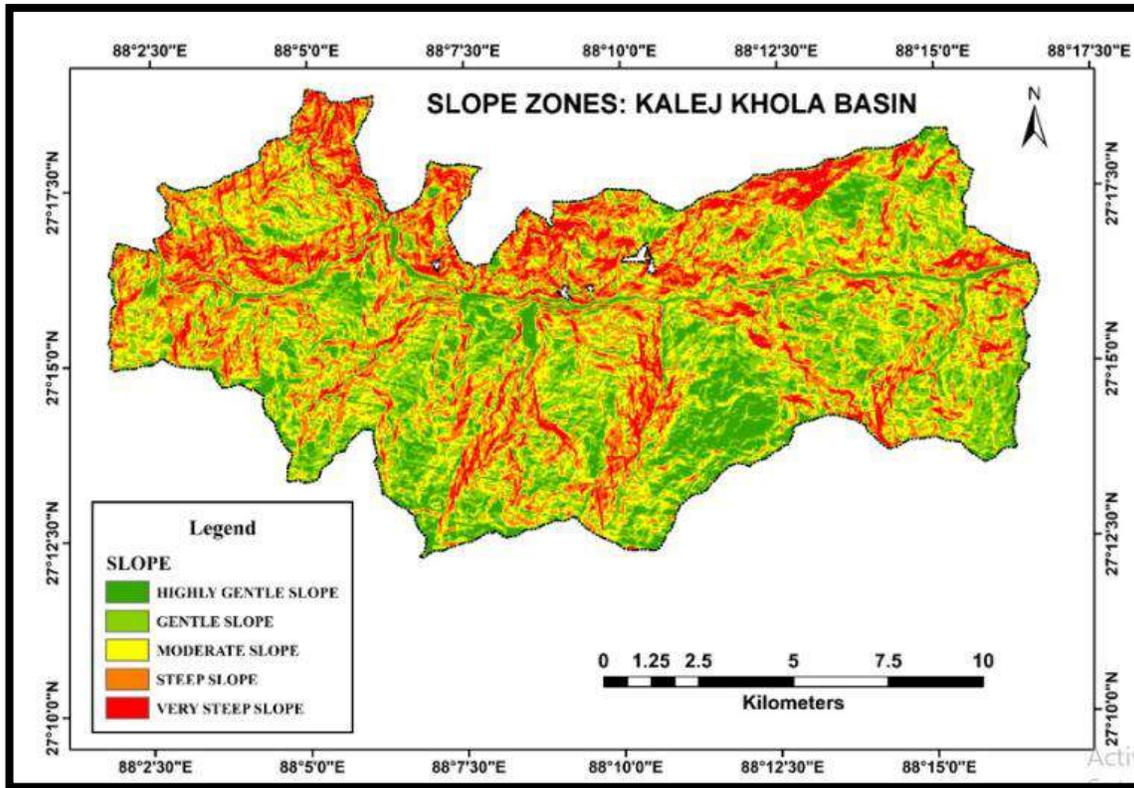
The Slope Map (Map No 9) and Slope Zonation Map (Map 10) help us in the study of the slope aspects of the area. The maps reveal that most of the area has very Steep (greater than 50 degree) to moderately gentle (13 – 27 degree) slope. Some areas on the southern, and south-western border of the basin area have slope values ranging between 0-degree and 13 degree. Some of these areas lie in the moderate and high elevation zones in the southern part of the basin, indicating the presence of uniform slope here. Major part of the area has slope values ranging between 13.32 degree to 39.92 degree. This indicates that the ground has strong to very strong slope. These slope values dominate mainly in the western part, i.e., the source region of Kalej Khola and the right bank of the stream, where though contour ranges are lower than southern part, the spacing of contours is high. Some parts of the region have extreme slope values and very steep values ranging between 39.93 degree and 55.54 degree, especially in western, northern, north-eastern and few pockets of southern part of the basin. The Geyzing market is present in an Escarpment having very steep slope i.e., more than 50 degrees in the north-eastern part of the Basin (Figure 5). The slope aspect plays a great role in determining the type and magnitude of landslide in any area. The areas

in Geyzing market having steep slope and escarpment are likely to be mass wasted easily and are prone to slides and falls.

Gentle slope areas on the other hand are more prone to slow creeping movements in the Southern part of the Kalej Khola. The Slope Zone Map clearly shows the relationship between contour spacing and slope characteristics. The southern part of the basin had high but gentle contour spacing, thus the area mainly falls under gentle and moderate slope zones. But the northern part, which had close spaced contours fall under steep and very steep slope zones. As long as Geyzing remains vegetated, it might not directly be affected by landslides, as it is the only factor that can manage slope failure in such steep slope zones where the rate of insolation received by the place, type and intensity of precipitation, runoff may work as positive factors for slope failure.



Map No 9. Slope Map: Kalej Khola Basin



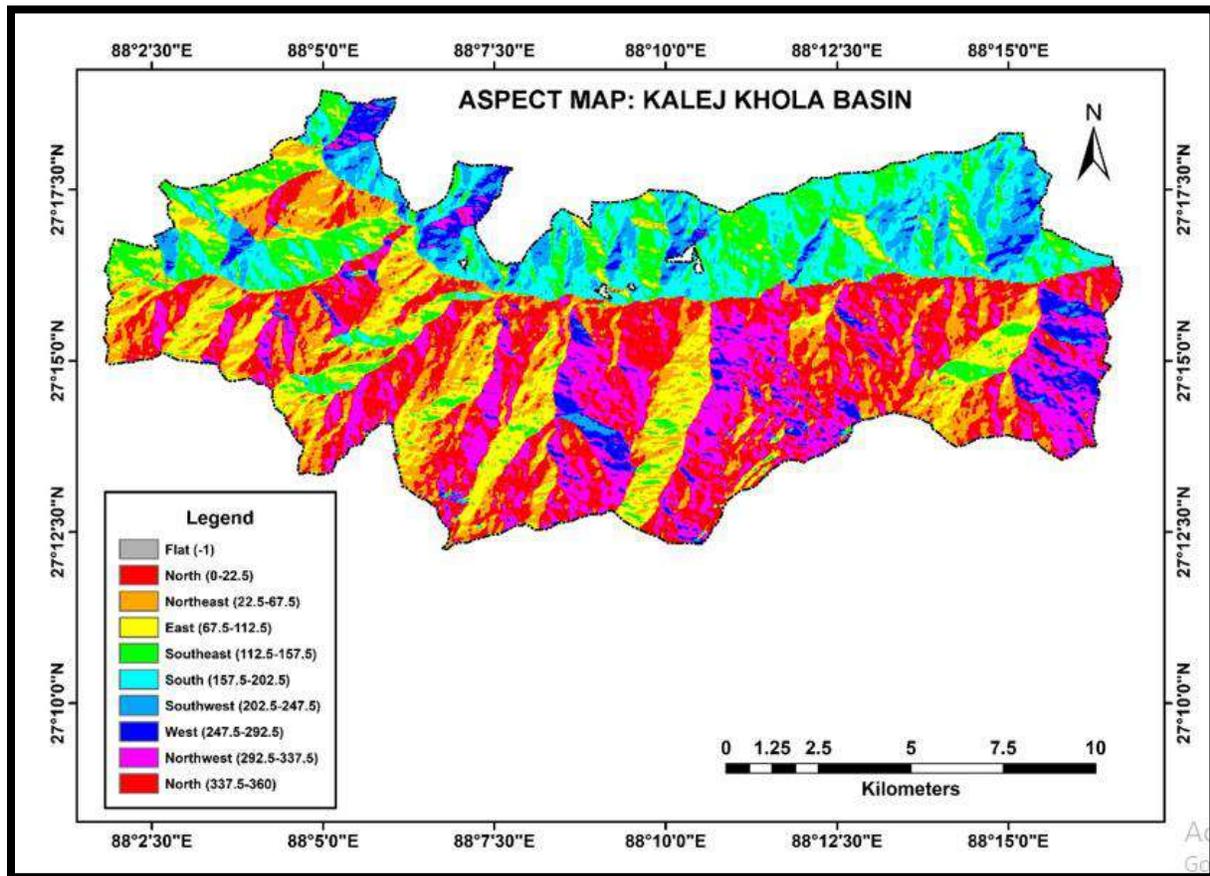
Map No 10. Slope Zones: Kalej Khola Basin

Aspect Map of the Kalej Khola Basin: -

Aspect is rendered one of the significant parameters in preparing land slide hazard zonation maps. On the context of this Aspect Map study involving a small area and highly unsuitable to analyze disparity of precipitation due to unavailability of spatial data. Exposure to solar radiation, rainfall and discontinuities which are related parameters of aspect largely controls the occurrence of landslides. Aspect degree is classified according to the aspect as steep north, west and gentle south, east so on.

An aspect map generally refers to the direction to which a mountain slope faces. The basin can be longitudinally divided into two distinct regions on the basis of aspect – the northern part of the basin (towards the right bank) is mainly south facing, whereas the southern part of the basin (towards the left bank) is north facing. The western part, i.e., the area from where Kalej Khola has its headwaters, has both south and north facing slopes. The northern part of the basin, including the north-eastern part where Geyzing Town lies has slopes having southeast to south west aspect making it an area which receives high rainfall as well as high rate of insolation. This implies that

the intensity of weathering is high here. However, this also aids in vegetation growth. However, if deforested, the steep slopes present here makes this location unstable. The



Map No 11. Aspect Map: Kalej Khola Basin

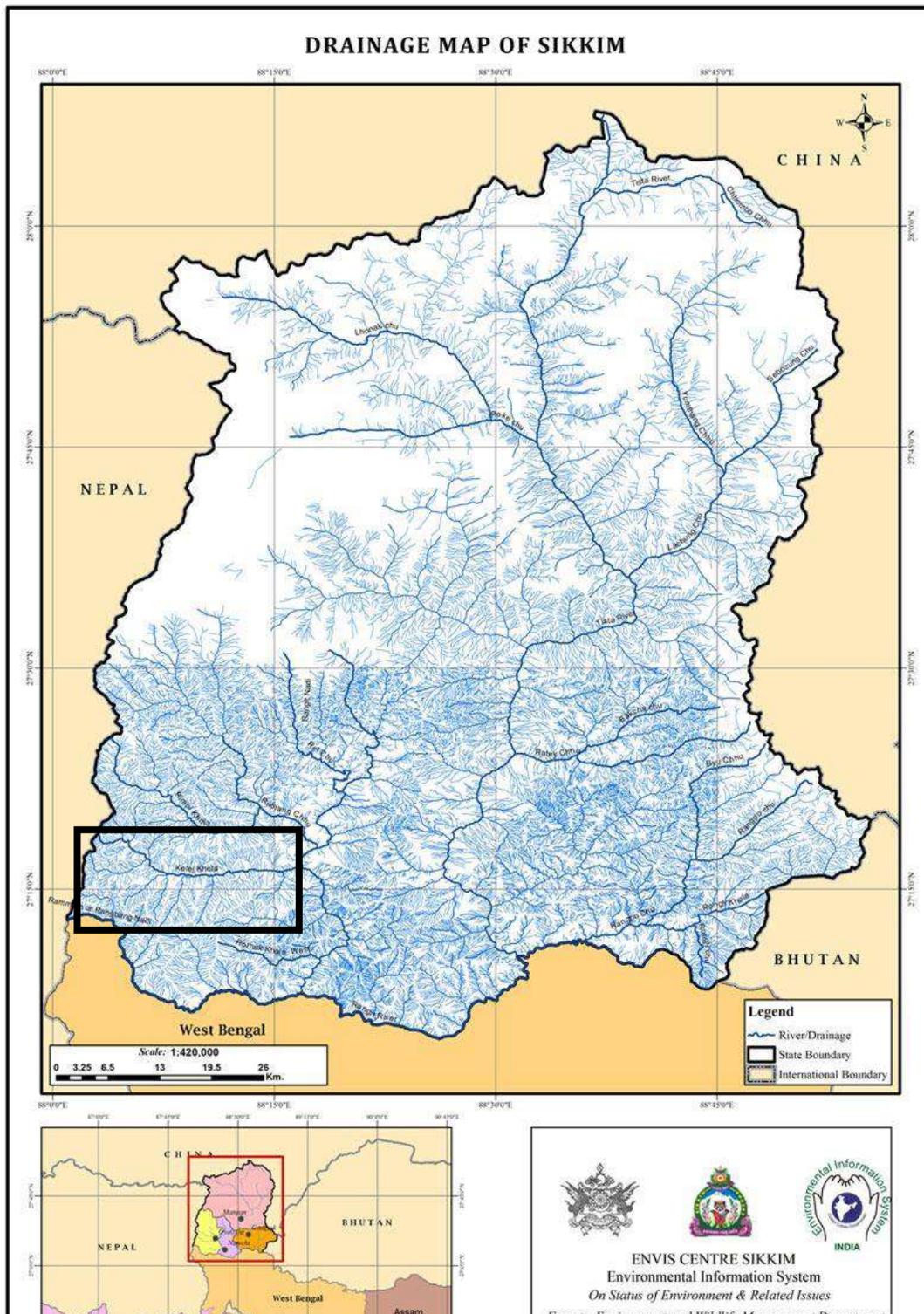
southern, south-western and south-eastern part of this basin have north, north-east and east facing aspect due to which the rate of insolation and rainfall is lower. Though this also affects the growth of vegetation, still owing to low rainfall and gentle slope, this area is less vulnerable to landslides. The aspect map is very important parameter to understand micro climatic effects or impact of solar radiation on local climate of the Kalej Khola basin as well as Geyzing area.

6.6. DRAINAGE CHARACTERISTICS OF THE AREA: -

Drainage is one of the most important factors that control landslides as its densities denote the nature of the ruggedness of the area, its soil, geological properties and even condition of land use/ land cover.

The streams emerging from the hills on the plain below are strikingly divided into numerous branches and channels. In the hilly region the main water parting may be marked distinctly, which runs from west-east ward, separating the south-westerly drainage from the north-easterly drainage which is carried to Kalej Khola. The total basin area is 175.200918999 sq. kms. total Basin Surface

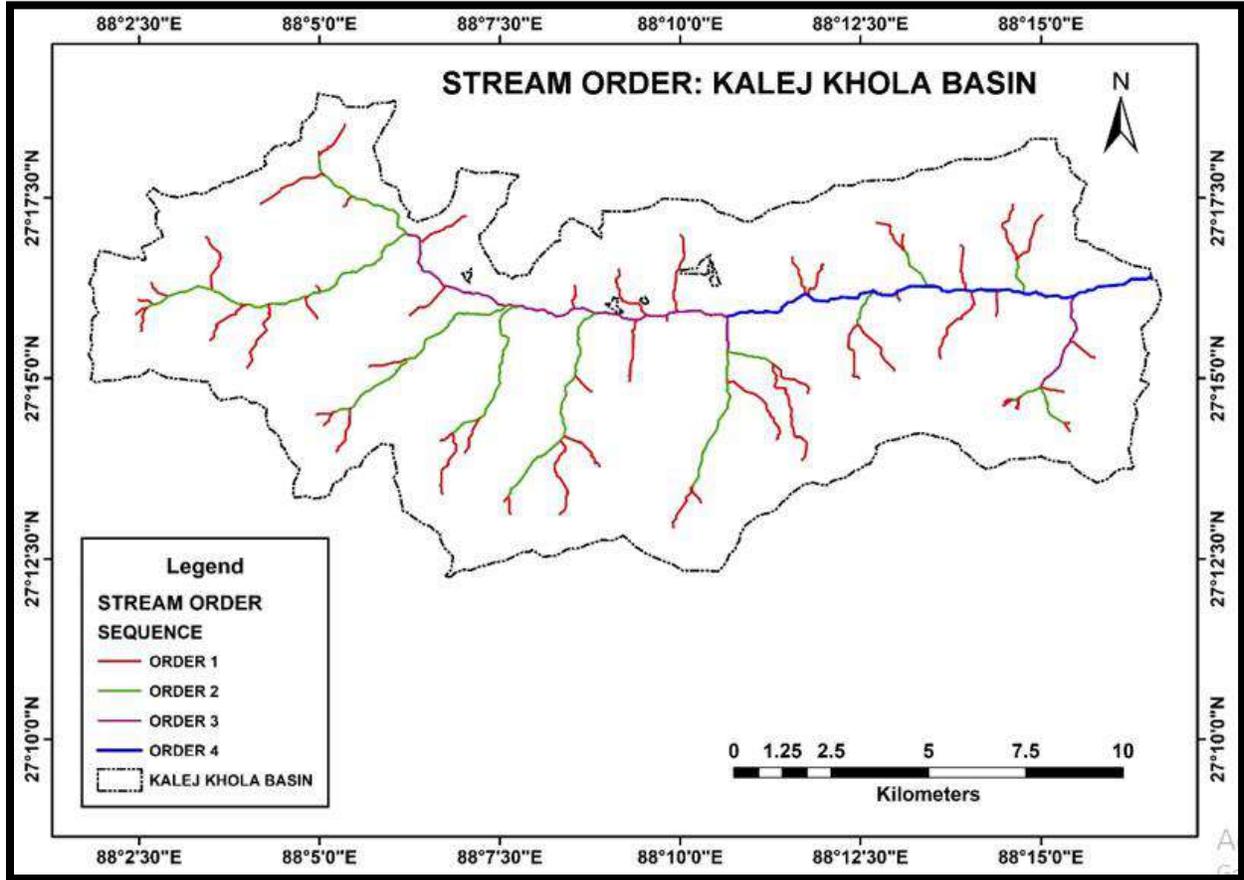
Area is 202.022840333 sq. kms. The total Basin perimeter is 90.2083993713km. The Basin Length is 24.217305599 km and the Main Channel Length is 19.873004487 km.



Map No 12. Location of Kalej Khola Basin in the Drainage Map of Sikkim (Source: ENVIS, Forest, Environment and Wildlife Management Department, Government of Sikkim)

Importance of Stream Order Sequence Map: -

The classic use of stream order is in general hydrological cartography. Stream order systems are also important for the systematic mapping of a river system. Landslides are one of the most important geo-hazards, where several components are involved in a systematic manner so that one component leads to the other in such a manner that ultimately the slope fails and materials



Map No 13. Stream Order: Kalej Khola Basin

are carried downstream. Kalej Khola basin has 175 sub channels and one main channel called Kalej Khola (Figure 13).

In this basin total no of First order streams are 150 and the total length of first order stream is 85627.9339917 metre (85.63 km). Total number of second order streams are 15 and the total length of second order stream is 37470.4982654 metres (37.47 km). Total number of third order streams are 8 and total length of third order stream is 19377.4716019 metre (19.38 km). Finally, the total length of fourth order stream is 19873.0044867 metres or 19.8 km. and the total length of all



streams is 162348.908346 metres (162.35 km). It is generally held that streams upto third order are designated as headwater streams and from fourth to sixth order as medium streams. In case of Kalej Khola, thus, it can be concluded that it is a medium length stream, whereas other streams joining it are all headwater streams. Most of these, especially the first order streams are temporary in nature.

Morphometric Parameters of the Basin and their Implications

Bifurcation Ratio (Rb): Dimensionless number denoting the ratio between the number of streams of one order and those of the next-higher order in a drainage network. The Average Bifurcation Ratio of the basin is 4.84722 and individually the values are -

Rb for 1:2=10.0

Rb for 2:3=1.875

Rb for 3:4=2.667

The bifurcation ratio is an important indicator for structural control and well as flow characteristics of a channel. According to Rao (2016) Rb less than three indicates lack of structural control and more than 5 indicates greater structural control. Here, it can be seen that the Rb between Order 1 and 2 is 10. This indicates that the area not only has greater structural control, but also is geologically disturbed and rugged in nature. High Rb values also indicate elongated basin shape. It is known that elongated basins yield low but extended peak flows. However, the Rb for Order 2 and Order 3 is just 1.875 and that between Order 3 and Order 4 is 2.667, which indicates low structural control and limited ruggedness, but greater probability of flash flood as such basins yield high flows of shorter duration. The average Rb is 4.84722 which is closer to 5, indicating moderate structural control for the whole area. Also, it is notable that the number of streams is very high for the first two orders indicating that the area occupied by first and second order stream is under erosion and geological difference is localized in nature. The mean Rb also indicates well developed drainage network.

Circularity ratio: Circularity ratio (Rc) is defined as the ratio of basin area (A) to the area of a circle having the same perimeter (P) as the basin (Strahler 1964; Miller 1953). It is mainly controlled by geology and structure, relief, slope, climate, stream frequency and length and landuse within the basin area. A value near to one means more circular shape and it gets scope for uniform infiltration and takes long time to reach excess water at basin outlet, which further depends on the prevalent geology, slope and land cover (Strahler, 1964). The Rc of Kalej Khola Basin is 0.270631100618, which indicates that it is **not circular** in nature and the materials lack homogeneity. Thus, the rate of infiltration is low and runoff rate is high. The water takes lesser time to reach the outlet.

Elongation Ratio (Re): According to Schumm (1956), it is the ratio of the diameter of the circle of the same area, as the basin area to the maximum basin length. The elongation ratio of basin can be

grouped as circular (>0.9), oval (0.8-0.9), less elongated (0.7-0.8), elongated (0.5-0.7) and more elongated (<0.5) (Strahler, 1968). The Kalej Khola basin has Re of 0.616733404835, which indicates that the basin is **elongated** and the area is of high relief and steep slope. In case of elongated basins, the tributaries flow into the main stream at greater intervals of time and space and this broader distribution of flow path lengths and, therefore, a wide range of travel time results in lower peak flow of longer duration. From Re, it can be concluded that this area is not a flood prone area, provided all other factors testify so.

Form factor (Ff): According to Horton (1945), form factor predicts the flow intensity of the basin of a defined area. It is the ratio of area of the basin in the square of basin length. There is a direct relationship of form factor with peak discharge. The value varies from 0 to 1. Low form factor indicates elongated basin shape. The basin of high form factor has a peak flow for shorter duration. The value of form factor would always be greater than 0.78 for a perfectly circular basin. The Ff of the Kalej Khola basin is 0.298734056039, which again indicates **elongated** nature of basin.

Fitness Ratio (Rf): The fitness ratio (Rf) is the ratio of main channel length to the basin perimeter, which is a measure of topographic fitness (Melton 1957). The Rf of Kalej Khola basin is 0.220301043201 which indicates

Shape Factor: The Shape factor can be defined as the ratio of the square of the basin length to the area of the basin (Horton, 1945). And is in inverse proportion with form factor (R f). The Shape Factor Ratio of Kalej Khola basin is 3.34745898496 indicating that the basin is elongated in nature.

Compactness Coefficient: The compactness coefficient (Cc) is the ratio of perimeter of basin to circumference of circular area, which equals the basin area (Gravelius 1914). It is also known as Gravelius Index. The Cc is independent of size of watershed and dependent only on the slope. Lower values indicate more elongation of the basin and less erosion, while higher values indicate the less elongation and high erosion. The Cc of Kalej Khola Basin is 1.93619913019, which again proves that the basin is elongated and less prone to erosion.

Other Basin parameters are listed below

Relative perimeter	1.94217966642
Length Area Relation	31.0634625521
Rotundity coefficient	2.63014622577
Mean Basin Width	7.23453392792

Drainage Texture Analysis:

Drainage texture can be studied with the help of the relative spacing of drainage lines. G.H. Smith (1950), Horton (1945) defined drainage texture on the basis of Drainage frequency and Drainage

density. Drainage texture depends on the underlying lithology, infiltration capacity and relief aspect of the terrain. Smith (1950) has classified drainage texture into 5 different textures i.e., very coarse (<2), coarse (2 to 4), moderate (4 to 6), fine (6 to 8) and very fine (>8). More is the texture more will be dissection and leads more erosion. Badland topography has fine drainage texture. Impermeable clays and shales, sparse vegetation and scanty rainfall are responsible for fine drainage texture. **Sand and gravel outwash plains have coarse drainage texture. 9**

The Drainage Texture value of Kalej Khola basin is 1.95103783269, which is less than 2, hence indicating roughness of the terrain and thus **very coarse drainage texture**.

Drainage Density (Dd): It is the ratio of the total length of streams with in a watershed to the total area of the watershed; thus, Dd has units of the reciprocal of length (I/L). A high value of drainage density would indicate a relatively high density of streams and thus a rapid storm response. It is defined as the length of drainage per unit area. It is an inverse function of permeability and therefore is an important factor in run off studies. The term was first introduced by Horton (1932) and is determined by dividing the total length of streams with in drainage basin by the drainage area. A high drainage density reflects a highly dissected drainage basin with a relatively rapid hydrologic response to rainfall events, while a low drainage density means a greater permeability with a slow hydrologic response (Melton 1957; Gupta and Srivastava 2010). Drainage density of Kalej Khola basin is 0.926644159593 (km/km²) and Modified Drainage density is 0.803616601362 (km/km²), indicating **low drainage density** as both the values are less than 1km/sq.km. This also indicates **low rainfall intensity, lower rock resistivity, low mean annual runoff, higher infiltration capacity, higher vegetation cover, and good drainage**.

Stream Frequency (Fs): It is the ratio of the total number of stream segments per drainage area (Horton1932). It is also called drainage frequency or channel frequency. Lithology and texture of the drainage network influence the stream frequency. It is a good indicator of the drainage pattern. Generally, high value of stream, frequency (Fs) is related to low permeability, high runoff, high relief conditions and low infiltration capacity (Reddy et al. 2004) and vice versa.

The Stream Frequency of Kalej Khola basin is 1.00456094069 (number/km²) and the Modified Stream frequency is 0.871188622584 (number/km²), indicating **lower stream frequency** and lower runoff and erosion.

Constant of Channel Maintenance: Schumm (1956) used the inverse of drainage density or the constant of channel maintenance as a property of landforms. The constant indicates the number of Km²/Km of basin surface required to develop and sustain a channel 1 km long (Pareta et al., 2011; Pareta & Pareta, 2012). The constant of channel maintenance indicates the relative size of landform units in a drainage basin and has a specific genetic connotation (Strahler, 1957).

The Constant of Channel Maintenance values for Kalej Khola basin is 1.07916290158(km²/km) and the Modified Constant of channel maintenance is 1.2443744919(km²/km) which indicates **moderate structural disturbance and moderate runoff**.

Infiltration Number (If): The infiltration number (If) of a basin is the product of the 'Dd' and 'Sf' and describes about the infiltration physiognomies of the basin area. It is inversely proportional to the infiltration capability of the basin (Romshoo et al. 2012). The higher the 'If' value, the lower will be the infiltration and the higher runoff. The If value of Kalej Khola basin is 0.93087052865 and the Modified Infiltration Number is 0.700101640026 which is quite **low** and indicates **higher infiltration and lower runoff**.

Drainage Intensity (Di): Faniran (1968) defines the drainage intensity, as the ratio of the stream frequency to the drainage density. The Drainage Intensity value of Kalej Khola Basin is 1.08408489957

Length of Overland Flow (Lg): Horton (1945) used this term to refer to the length of the run of the rain water on the ground surface before it is localized into definite channels. Since this length of overland flow, at an average, is about half the distance between the stream channels, Horton, for the sake of convenience, had taken it to be roughly equal to half the reciprocal of the drainage density (Rai et al., 2017a & 2017b; Rai et al., 2018). River basins with lower overland flow values also designate that in such basins less rainfall is adequate to pay a substantial volume of surface run off to stream discharge (Muthukrishnan et al., 2013). The Lg of Kalej Khola is 0.539581450791kms. and the Modified Average Length of Overland Flow (Kms) is 0.622187245949. This factor is very important in this area, due to the nature of slope too. This indicates that **rain water will enter the stream relatively quickly, and lesser rainfall is sufficient to contribute a significant volume of surface run off to stream discharge**. Also, this factor has an important control over lag time (Chorley 1969) due to the fact that the mean velocity of the unconcentrated overland flow is less than concentrated channel flow. Smaller values can cause flash floods in days of heavy rain, due to the reduced possibility of water infiltration into the soil (Olszewski et al. 2011).

The lower values of Dd, Sf and Di also indicate slow removal of surface runoff from the basin making it susceptible to flooding, gulying and landslides, depending on the relief and materials involved.

6.7. VEGETATION CHARACTERISTICS: -

Kalej Khola basin is situated in an ecological hotspot of the Sikkim Himalayas, one of only three among the eco regions of India. The forested regions of the state exhibit a diverse range of fauna and flora. Owing to its altitudinal gradation, the state has a wide variety of plants, from tropical species to temperate and is perhaps one of the few regions to exhibit such diversity within such a small area. Nearly 55% of the area of this basin comes under the administration of the forest department of West District, Sikkim.

Orchids, Laurel, Bananas, Sal trees and bamboo grow in the subtropical broadleaf forests of the lower altitudes of the basin.

More than 50% area of the basin is covered by the almost uninterrupted forest ranging between wet deciduous to coniferous vegetation. Except the arable land along both sides of the major streams, this basin is covered by the moderate to dense forests that are generally almost evergreen in nature. The nature of forests changes with the increasing altitude towards the ridges of north and south margins and westerly situated highly dissected terrains. The main forest product of the study area for timber and fuel which are much wanted for the construction of households, furniture and daily domestic purposes. There are also some medicinal herbs, fibers, rubbers which are considered as other minor but significant forest products.

The vegetation types of West District including Kalej Khola Basin are:

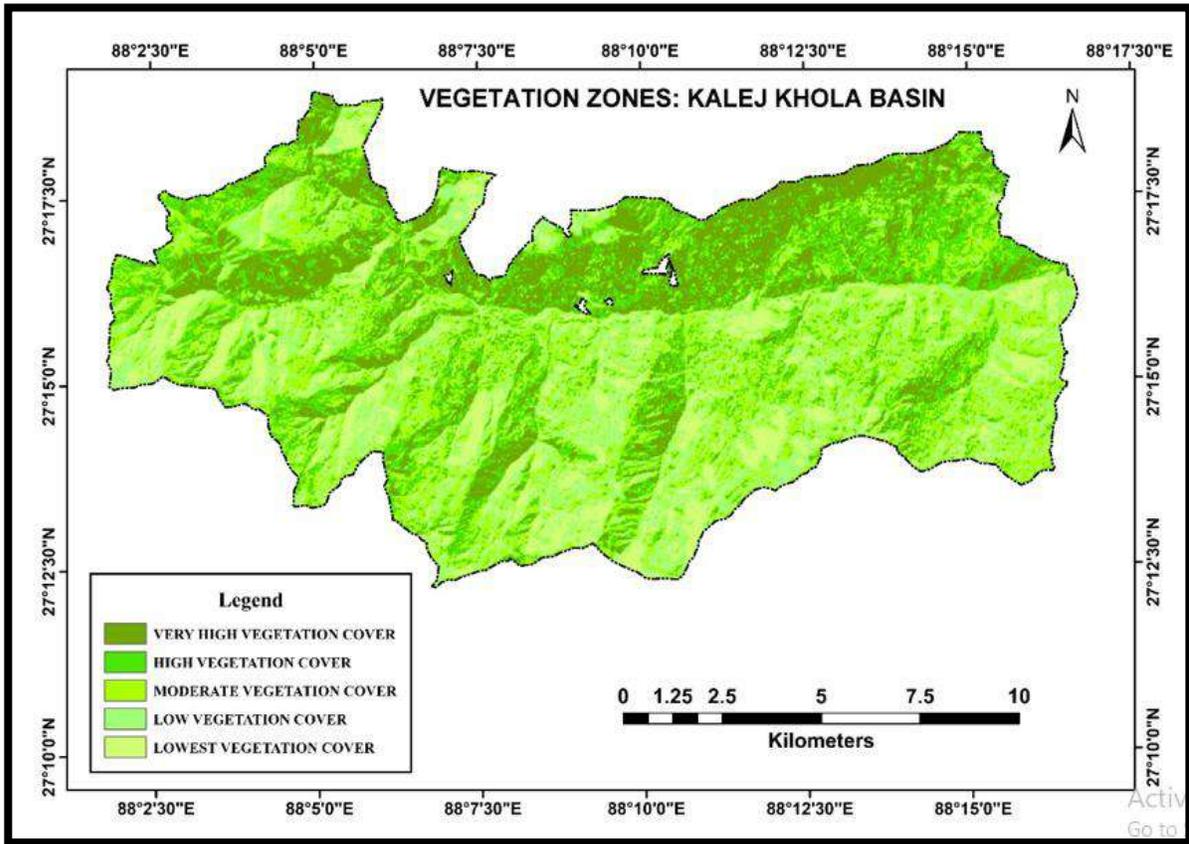
- a. Very moist Sal bearing Forest-Eastern part of the basin.
- b. East Himalayan Sub-Tropical Wet Hill Forest -Eastern, Middle Eastern parts.
- c. East Himalayan Wet Temperate Forest- Middle Western and South Western parts.
- d. Oak Rhododendron Forest- Northern- Eastern ridge areas.
- e. Cultivable and other Land- Both side river terraces

Various types of colourful flowers species are found all over the Kalej Khola basin, especially on the mountainous slope and terraces. Marigold, Rose, Wild Rose, 34 China Rose, Pansi, Zirenium and also the most remarkable various types Orchid species are found here. The entire basin is ornamented with diversified colourful flowering plant species. In other words, it can be said that Kalej Khola basin represents the rich level of bio-diversity off lowering plant species.

Climatic condition has influenced the vegetation cover of the region. Forests are one of the wonderful creations of earth surface. The socio-economic background of the study area is based on the natural forest resources. It also influences the soil erosion and landslide.

The monsoon rainfall after the warm summer is very useful for paddy cultivation on flat terraces and cardamom plantation on sloping hill terraces. The flowering plants sprout after the rain lashes down to this area. The monsoon along with post-monsoon rainfall is very beneficial for the enrichment of soil fertility and the Rabi-period crop production. The monsoon along with post-monsoon is the season of growth as well as environmental hazard as landslide etc. The huge number of sliding materials like sand, soil, pebbles are carried out by the mountainous sloping faces and streams mainly during this period. The winter is very ideal for the floriculture, pulse and vegetable cultivation which is the important Rabi crops of this season, besides the orchard in Legship, Lingchom, Dentam, Uttarey regions thrives its best in winter season. Humidity decreases with the full onset of winter. The intense isolation in the mountain slopes occurs due to rapid heating of the mountain slope. This upslope breeze is called fee anabatic wind. This is sometimes accompanied by the formation cumulus cloud cover near mountain scarps and sloping faces. Occasional thunder splashes are very common in the high land - areas during pre-monsoon and

monsoon months. The rain is mostly of orographic type occurring in the northern southern marginal highlands and south-western greatly dissected lands. Natural radiation brings about a more rapid cooling of mountain slopes. At night temperature decreases resulting in cooling of the river valleys by the down moving katabatic wind. The cold wind is experienced in the low areas and produces fogs during post-monsoon and winter seasons.



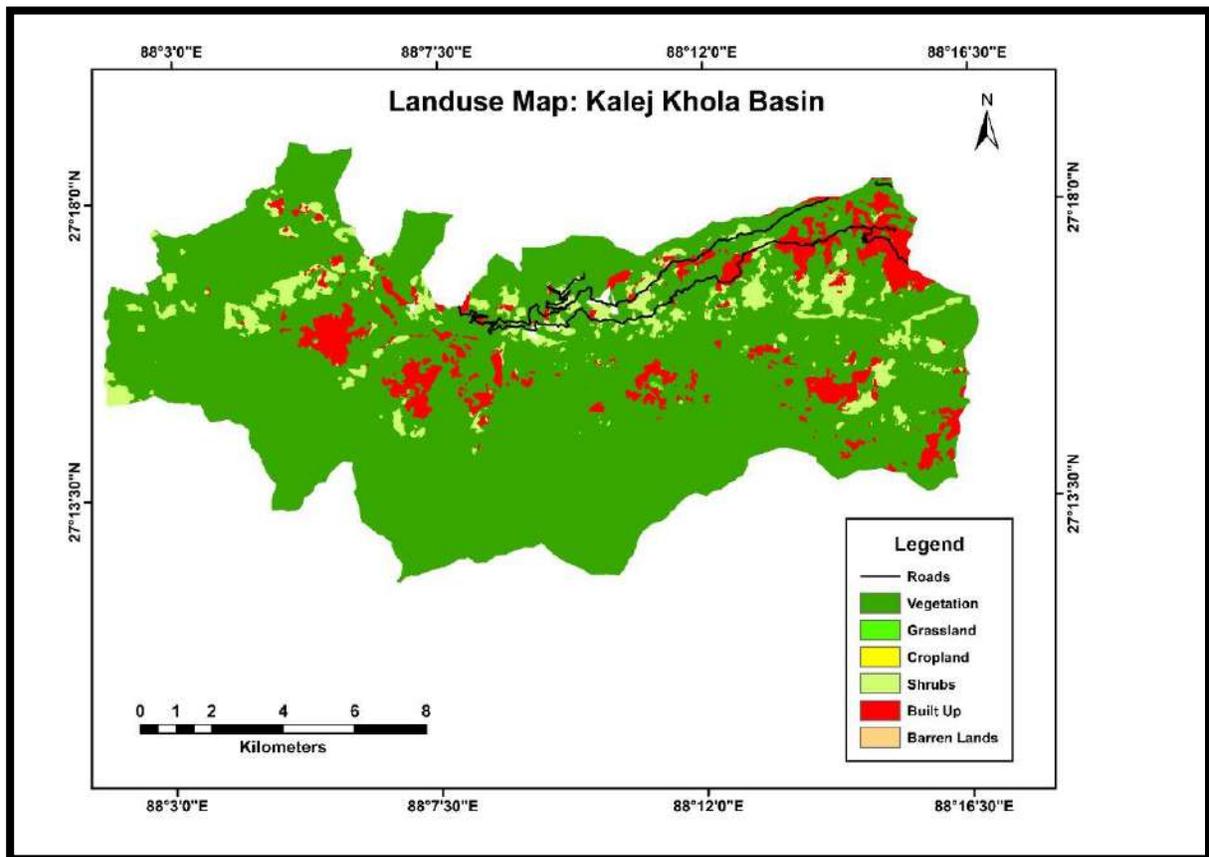
Map No 14. Vegetation Zones: Kalej Khola Basin

Vegetation, especially natural vegetation is an important indicator of slope stability in any area, especially an area of high relief and steep slopes. The presence of natural vegetation cover in any area is determined by the amount of rainfall, the temperature conditions, the slope aspect and human interference. Natural vegetation not only contributes to the amount of precipitation in any area, but also controls the amount of surface runoff, rate of infiltration, soil erosion etc.

The intensity and speed of mass wasting is directly controlled by the presence or absence of vegetation. By strengthening shallow soil layers and improving drainage, deep-rooted trees and shrubs can reduce the occurrence of shallow rapidly-moving landslides. Transpiration from extensive tree canopies can also decrease soil water content and reduce landslide risk constitute the tree canopy.

Vegetation maps are sought for as prime sources of information for making informed decisions on conservation and for providing information on biodiversity and other natural resources and on soil movement. In Kalej Khola basin the steep slopes are seen to have very high vegetation cover, and moderate sloped areas are seen to have low vegetation cover. This is mainly due to two factors. The south facing slopes in the northern part of the basin receive more rainfall and higher rate of insolation, which promotes plant growth. Moreover, owing to the presence of very steep slopes, human interference is somewhat limited till now. The rate of deforestation is checked. Till now, although maximum areas are seen to be susceptible for landslide due to high elevation and steep slope the factor that has resisted landslides has been vegetation. The Map No 14 shows the vegetation characteristics of Kalej Khola basin and Geyzing market which is located in this basin. However, compared to the total area of the basin, the area having very high or infact high vegetation cover is very low. The landuse changes from available data and landuse map make this fact clearer.

Shallow and dense vegetation is found on the steep slopes and escarpment area, grass land found in middle and western part of Kalej Khola basin, there are very less amount of barren land present in Kalej Khola basin which is demarked some of the portion is put to agricultural use. The overall map shows distinct landuse zones existing in relation to relief and slope characteristics



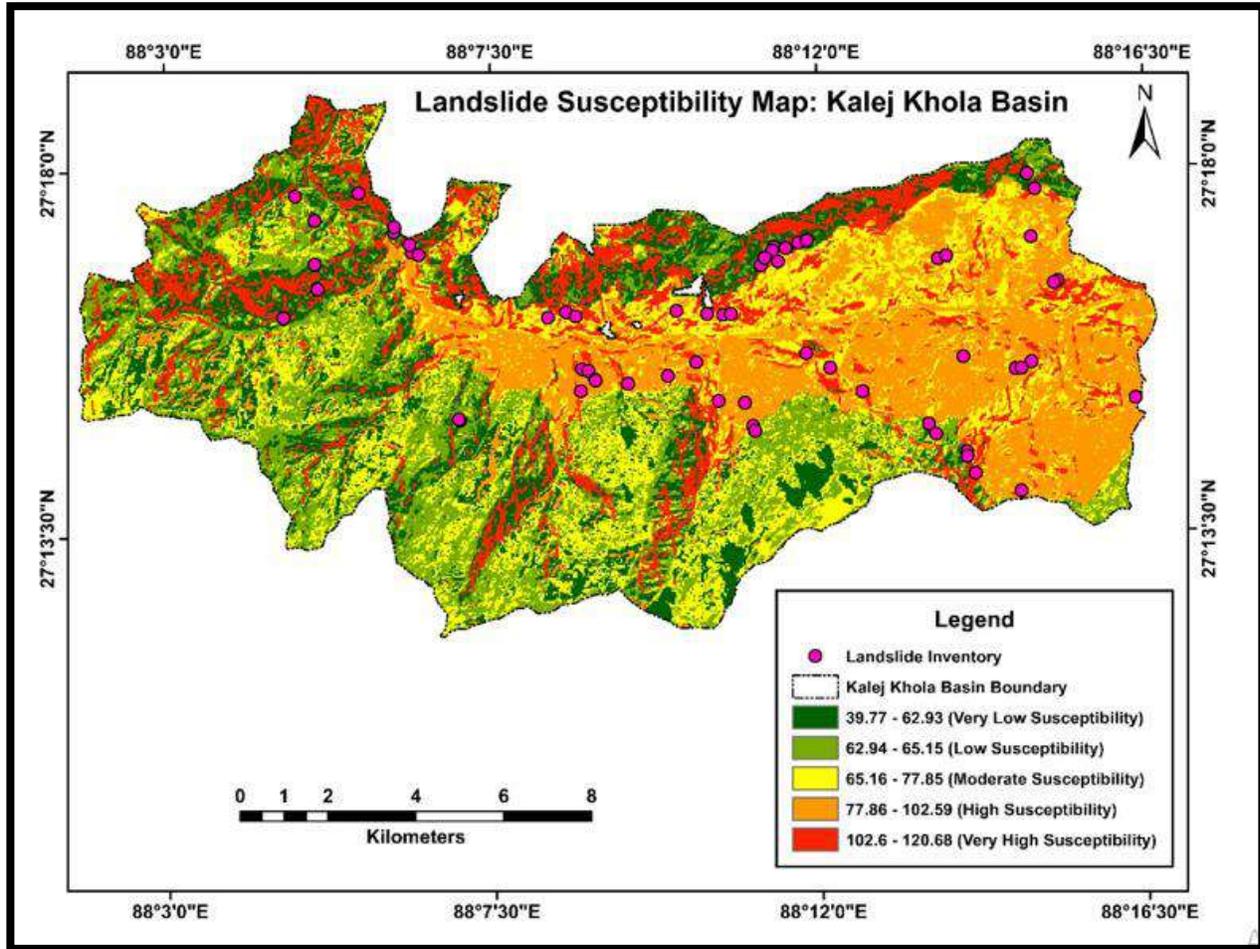
Map No 15. Landuse and Landcover of Kalej Khola Basin

6.8. LANDUSE AND LAND COVER: -

Residential and built-up area surrounds the Geyzing market, although there is absence of houses along the immediate left and right bank of the basin the Kalej Khola basin area has steep slopes. Settlements are mainly concentrated to the northern and eastern part of the Khola and in the high and middle zone at an elevation varying between 1100 to 2200 meters and in the lower valley stretch at an elevation less than 2000 to 3000 meters. Settlements are very less in the lower high zones at elevation above 2000meters. The transportation routes provide a good connectivity to the settlements. The network of roadways is concentrated in the settlement zone around the basins main stream and runs towards the middle and northeast part of the basin. The main transport connectivity connect the basis with other basin towards northeast .

The monsoon rainfall after the warm summer is very useful for paddy cultivation on flat terraces and cardamom plantation on sloping hill terraces. The flowering plants sprout after the rain lashes down to this area. The monsoon along with post-monsoon rainfall is very beneficial for the enrichment of soil fertility and the Rabi-period crop production. The monsoon along with post-monsoon is the season of growth as well as environmental hazard as landslide etc. The huge number of sliding materials like sand, soil, pebbles are carried out by the mountainous sloping faces and streams mainly during this period. The winter is very ideal for the floriculture, pulse and vegetable cultivation which is the important Rabi crops of this season, besides the orchard in Legship, Lingchom, Dentam, Uttarey regions thrives its best in winter season.

6.9. LANDSLIDE SUSCEPTIBILITY MAP: -



Map No 16. Landslide Susceptibility Map of Kalej Khola

The landslide susceptibility analyses were performed using the GIS-based statistical models using the Arc GIS 10.3. Landslide hazard maps indicate the possibility of landslides occurring throughout Kalej Khola basin. Landslide hazard map shows not only the chances that a landslide might form, but also the chance that it might travel downslope. In this Landslide susceptibility map of Kalej Khola basin (Map No.16) indicates that the north-western, western and south-western part of Kalej Khola basin is highly susceptible for land slide because of the high elevation and less vegetation cover. On the other hand, Geyzing is at a high elevation area but it is less susceptible for landslide because of vegetation cover of this area. The southern bank of Kalej Khola basin is highly susceptible but this is the low elevation area and also slope of this area is gentle. Main factor of this area which make this zone susceptible because of its less vegetation cover. Innumerable landslides have taken place in Kalej Khola basin (Map No.16).

Most of the landslides occur in western part of the basin where susceptibility values range between low to high. Also, the water divide lies here so the material of this area is loose and easily erodible and landslide prone. Middle part of the Kalej Khola basin also have had some landslides in the past because of its high elevation, transportation network and its less vegetative cover, we observed that most of the lands slide occurs by the main stream of the channel and also by the road network.

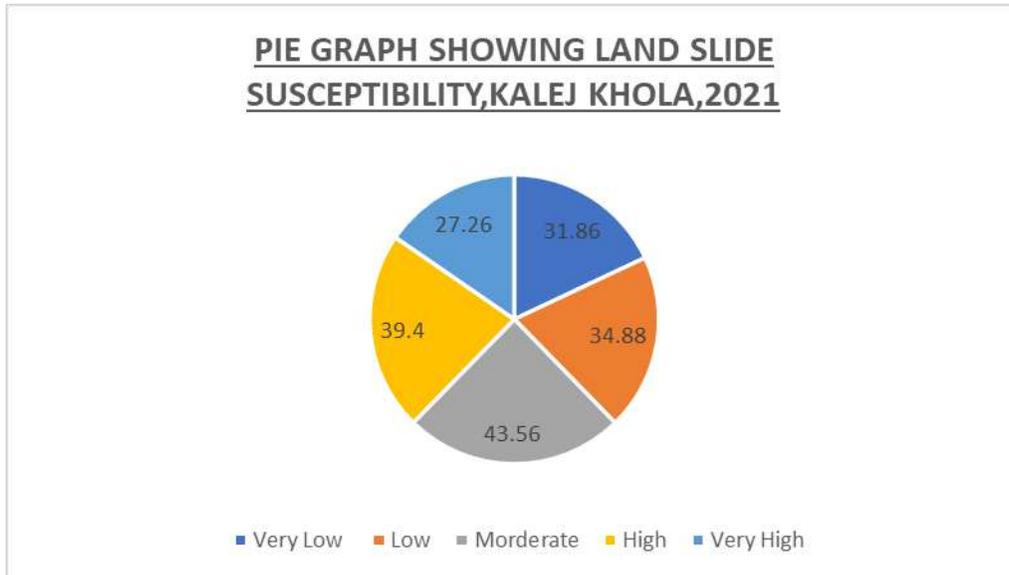


Fig No. 4: Area covered by landslide susceptibility zones

It is seen that majority of the area still fall within the moderate susceptibility zone. However the area under very high and high susceptibility is together 66 sq.km. Also the area which is presently under moderate susceptibility zone may be converted to high susceptibility due to faulty landuse.

7. MAJOR FINDINGS:

Almost the whole of Sikkim Himalayas is prone to landslides, slips and subsidence, mainly because of the complex geological structure and exogenetic forces operating in this terrain. Some areas in Sikkim are highly susceptible and some less. All the parameters that have been studied here, i.e., climate, soil and geology, geomorphology, including relief and slope, drainage, vegetation, landuse indicate how vulnerable the Kalej Khola Basin is to land failure.

- From the perspective of climate, the high annual range of temperature i.e. about 22°C and high annual range of rainfall i.e. about 600 mm. increases the vulnerability of this are to weathering and mass wasting processes at a high rate and subsequently landslides. The soil mainly being formed from weathered metamorphic and sedimentary rocks like sandstone, shale and schist proves the region is geologically weak. The presence of Gneissic complex, Quartzite, Slate and Coal seams indicate geological complexity and juxtaposition of Crystalline and Sedimentary complexes.

- Relationship between elevation and landslides has been studied. The scatter diagram shows the relationship between elevation and land slide relationship on Kalej Khola basin. The value of Y or $Y_c = a + bx$ Where, $a = 0.616$, $b = 0.001$ and the value of $r^2 = 0.961$

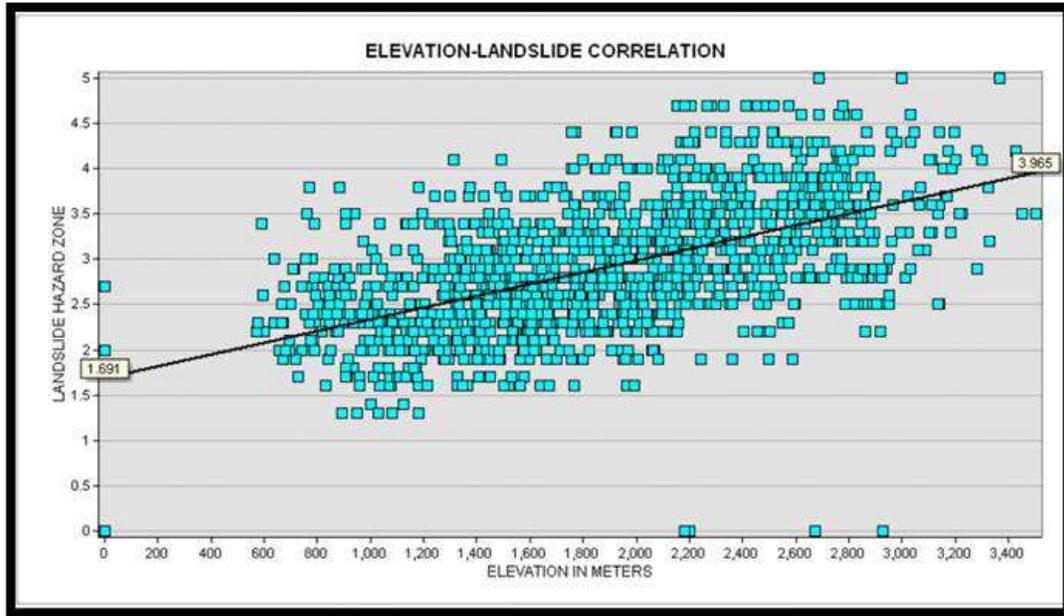


Fig No 4. Correlation Between Elevation and Landslide

From the given scatter diagram, it is observed that the trend line shows a positive relationship among elevation and land slide susceptibility where elevation of the Kalej Khola basin is increases landslide susceptibility also increases. The correlation coefficient being 0.961, indicates a very strong correlation.

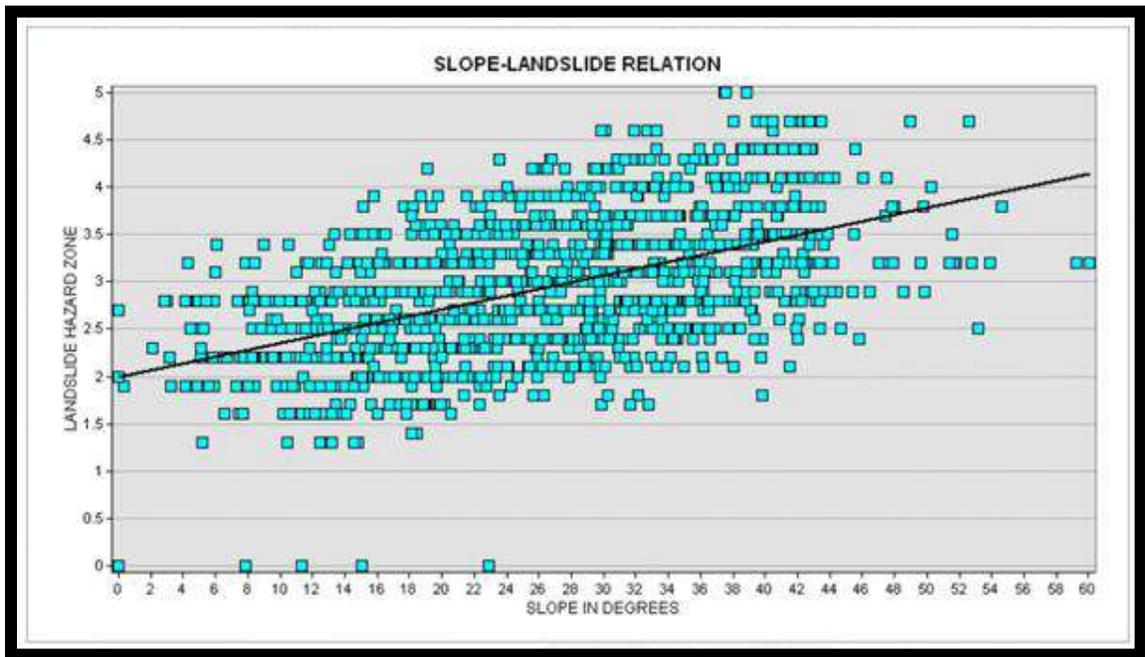


Fig No5. Scatter Diagram Showing Correlation Between Slope and Landslide Susceptibility

- Slope and landslides are also positively related. The scatter diagram shows the relationship between slope and land slide relationship on Kalej Khola river basin. The value of Y or $Y_c = a + bx$, where, $a = 1.435$, $b = 0.055$ and the value of $r^2 = 0.937$. Fig No5. Scatter Diagram Showing Correlation Between Slope and Landslide Susceptibility

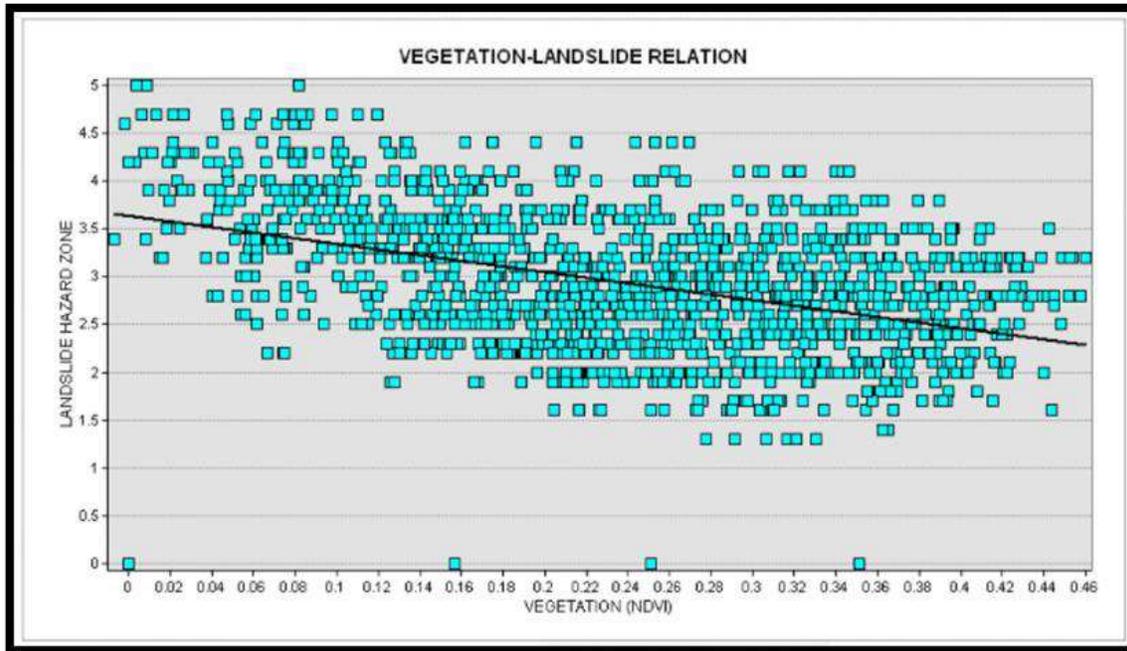


Fig No 6. Correlation Between Vegetation and Landslide Susceptibility

From the given scatter diagram, it is observed that the trend line shows the positive relationship among slope and land slide susceptibility where slope of the Kalej Khola basin is high the number of landslides is also high.

- Forests are one of the wonderful creations of earth surface. The socio-economic background of the study area is based on the natural forest resources. It also influences the soil erosion and landslide. The scatter diagram shows the relationship between natural vegetation and land slide relationship on Kalej Khola river basin. The value of Y or $Y_c = a + bx$, where, $a = 5.407$, $b = -6.892$ and the value of $r^2 = 0.911$.

From the given scatter diagram, it is observed that the trend line shows a highly negative relationship between vegetation and land slide susceptibility. As vegetation decreases landslide susceptibility increases.

- The relationship between landuse and landslide susceptibility is the most unique of all. A few columnar diagrams have been used to depict the trend of landuse change here between 1995 and 2012. Projected landuse change has been calculated and it has given some interesting findings.

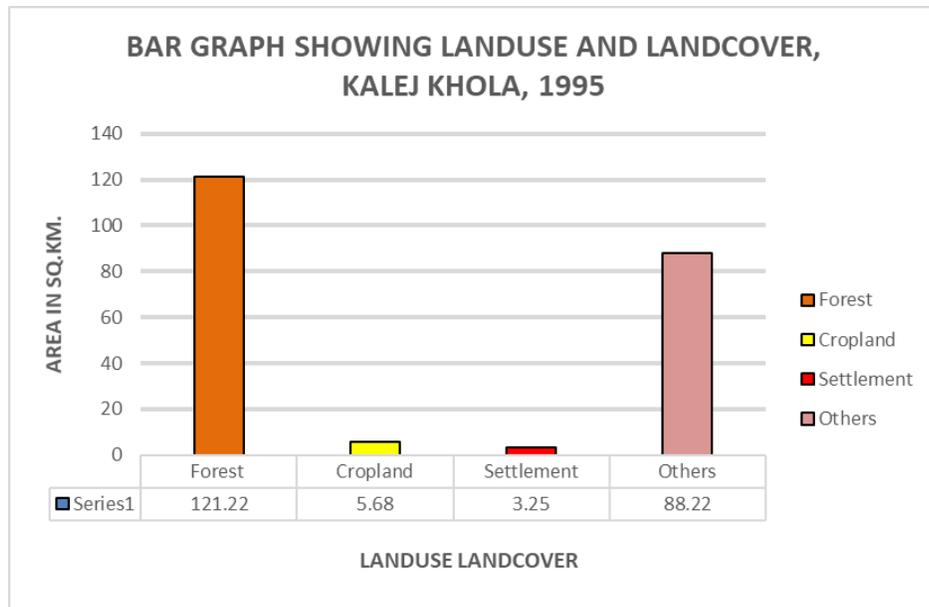


Fig No 7. Landuse and Landcover, Kalej Khola Basin, 1995. Data Source: http://www.isca.in/EARTH_SCI/Archive/v4/i11/1.ISCA-IRJES-2016-024.pdf

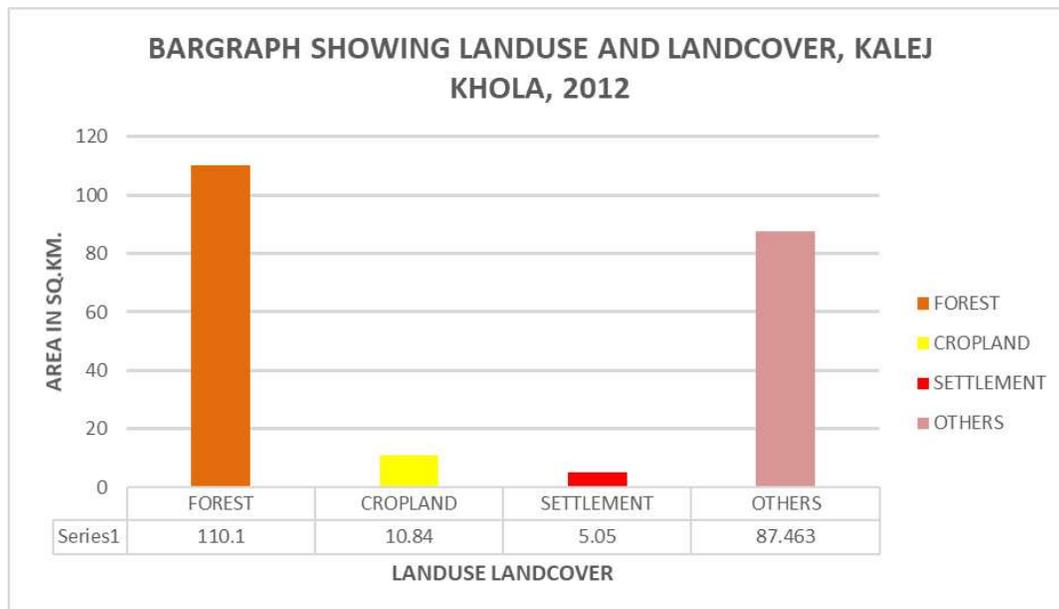


Fig No 8. Landuse and Landcover, Kalej Khola, 2012. Data Source: http://www.isca.in/EARTH_SCI/Archive/v4/i11/1.ISCA-IRJES-2016-024.pdf

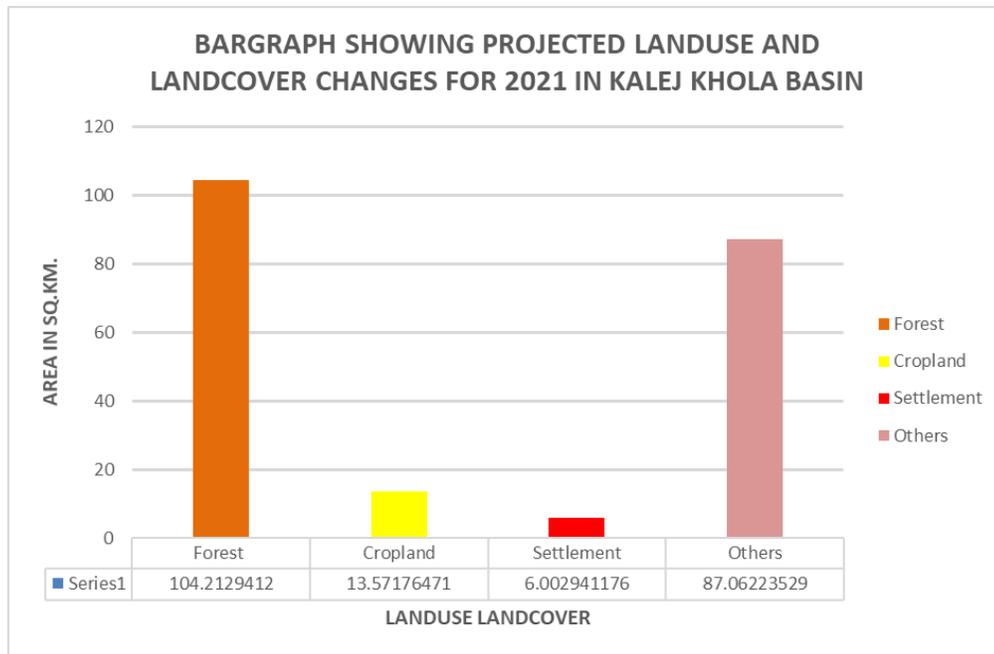


Fig No 9. Landuse and Landcover, Kalej Khola, 2021 (Projected). Data Source: http://www.isca.in/EARTH_SCI/Archive/v4/i11/1.ISCA-IRJES-2016-024.pdf

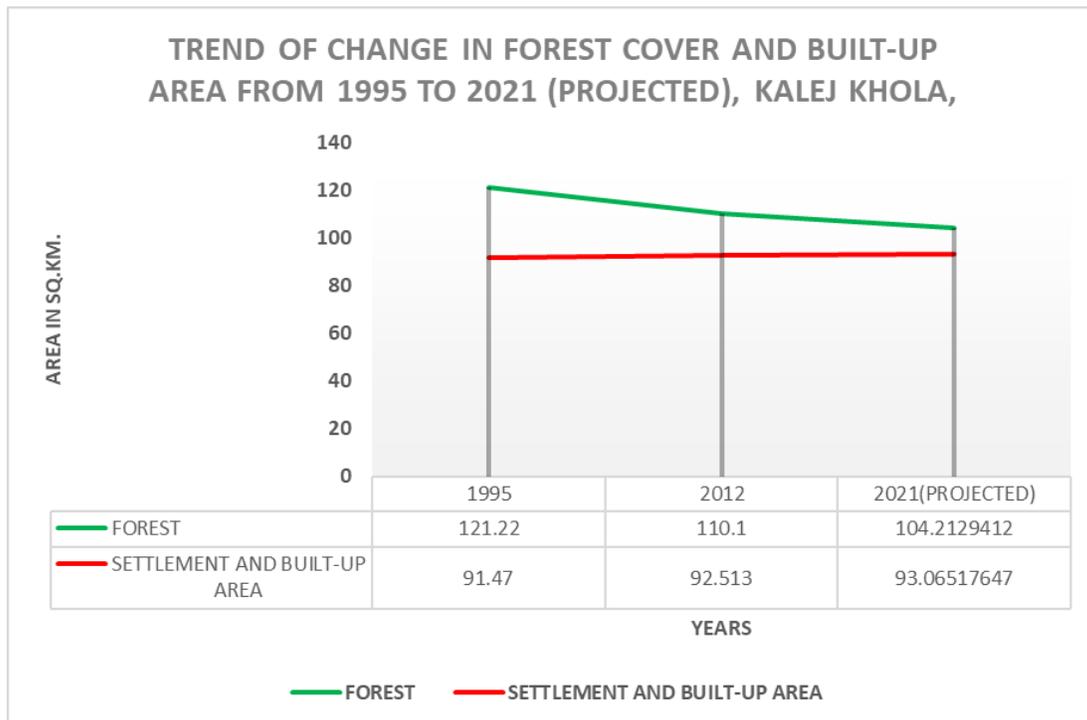


Fig No 10. Trend of Change in Forest Cover and Built-up area

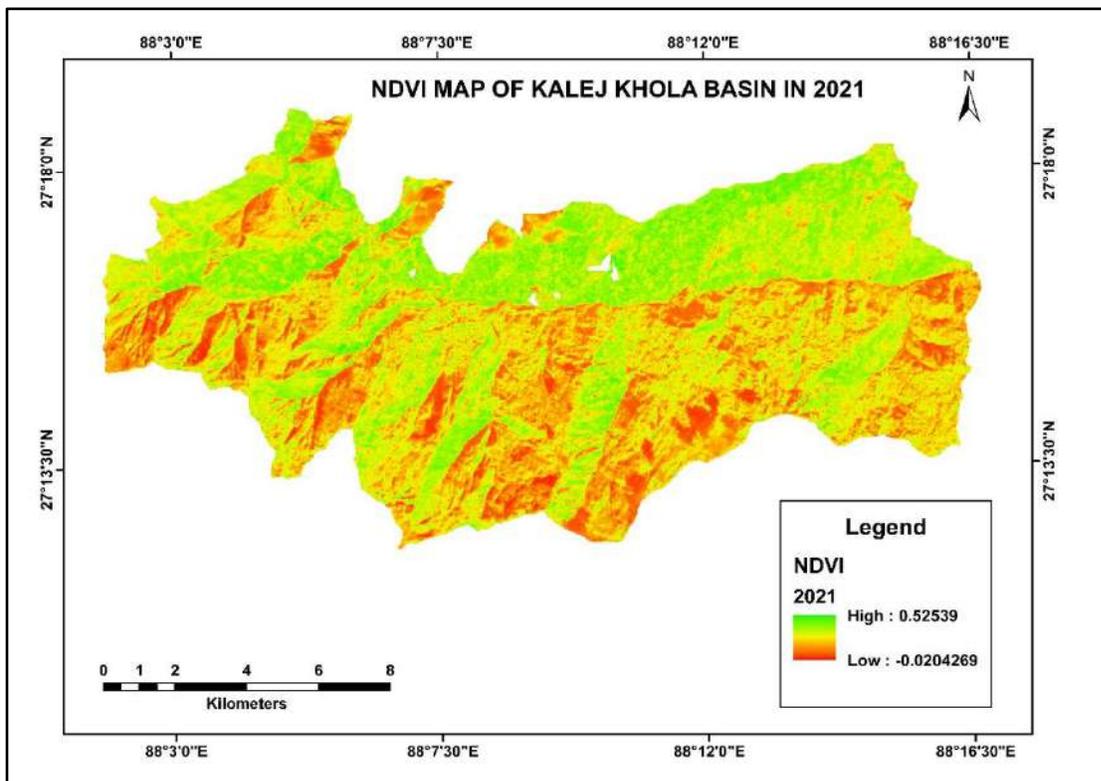
From the above diagram it is observed that the landuse pattern of Kalej Khola Basin from 1995 to 2012 increased due to growth of settlements, roads, cropland and other anthropogenic activities. With the help of the 1995 and 2012 data the projected rate of increase in built-up area was calculated, which shows some increase may take place around 2021 in case of built-up area, which is projected to increase from 103.353 sq.km. to 106.632 sq.km. Also, the available data shows a decrease of forest cover between 1995 and 2012. Forest cover in 1995 covered an area of 121.22 Sq.km but decreased to 110.1 Sq.km in 2012. It is projected that forest cover would reduce to 104.21 per Sq.km in 2021.

However, satellite data of 2021 deviated from the projected values. Vegetation is seen to increase between 2012 and 2021 and only slight increase of built-up area is seen. Thus, to understand why the number of landslides is high inspite of growth of vegetation the help of NDVI was taken.

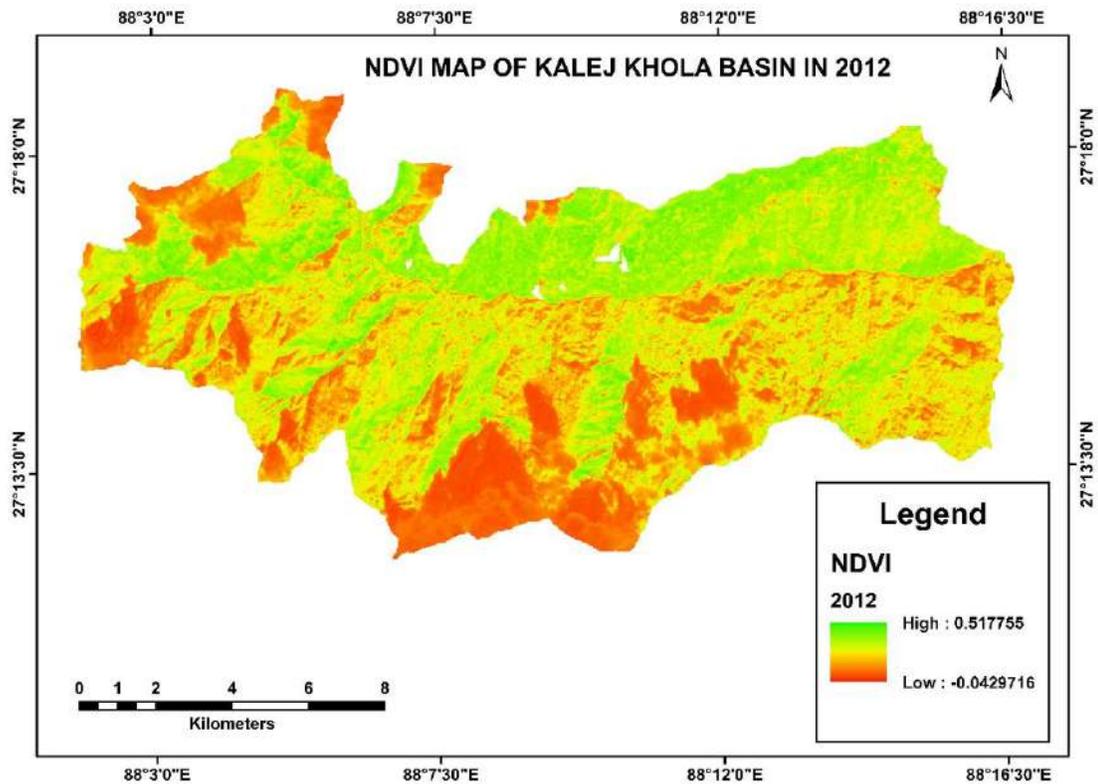
NDVI: To determine the density of green on a patch of land, researchers must observe the distinct colors of visible and near-infrared sunlight reflected by the plants. As can be seen through a prism, many different wavelengths make up the spectrum of sunlight. Nearly all satellite Vegetation Indices employ this difference formula to quantify the density of plant growth on the Earth — near-infrared radiation minus visible radiation divided by near-infrared radiation plus visible radiation. The result of this formula is called the Normalized Difference Vegetation Index (NDVI). Written mathematically, the formula is:

$$NDVI = (NIR - VIS) / (NIR + VIS)$$

Calculations of NDVI for a given pixel always result in a number that ranges from minus one (-1) to plus one (+1); however, no green leaves give a value close to zero. A zero means no vegetation and close to +1 (0.8 - 0.9) indicates the highest possible density of green leaves.



Map No 17.
NDVI Map,
Kalej Khola
Basin,2021



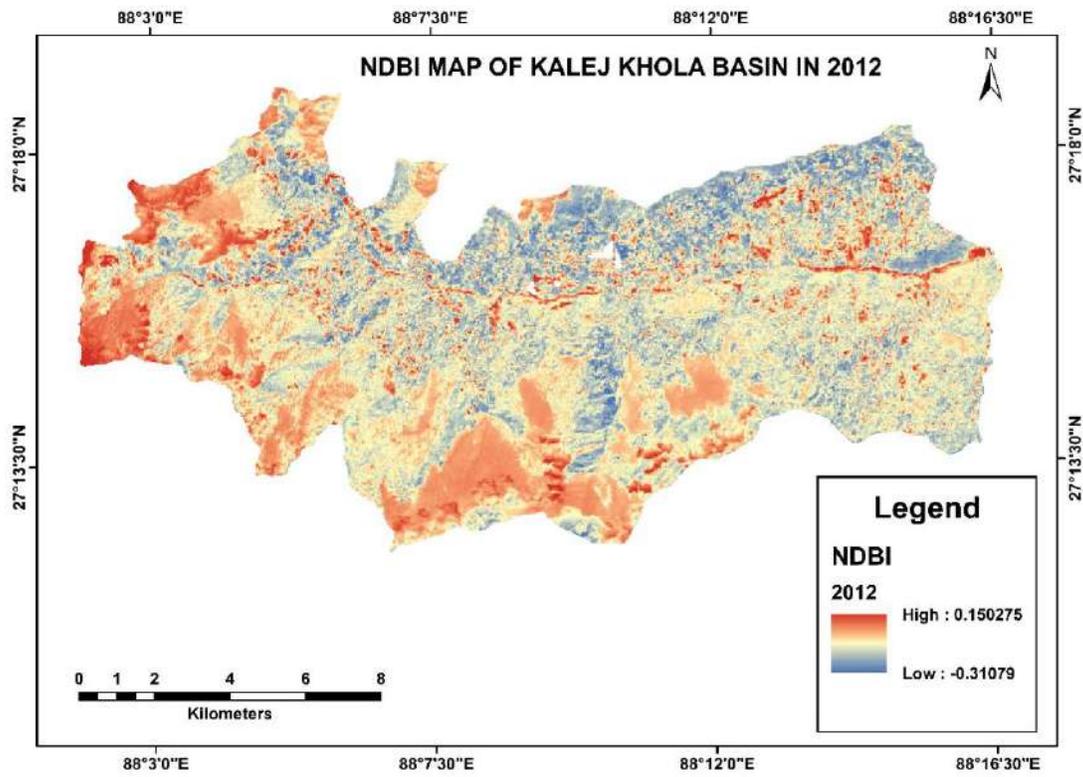
Map. No 18. NDVI Map, Kalej Khola Basin, 2021

The NDVI clearly shows positive growth in vegetation area from 2012 to 2021, which may be due to several afforestation programmes taking place here. However, NDVI values rating from 0.3 to 0.6 are considered as a stressed vegetation. NDVI values exceeding 0.6 are considered to be healthy vegetation (Bhatta, 2016). In 2012, The maximum NDVI value of Kalej Khola basin was 0.517 which slightly increased to become 0.52 in 2021. Since in both the years, the maximum NDVI value was within the range of 0.3 TO 0.6, the vegetation can be said to be in a stressed condition.

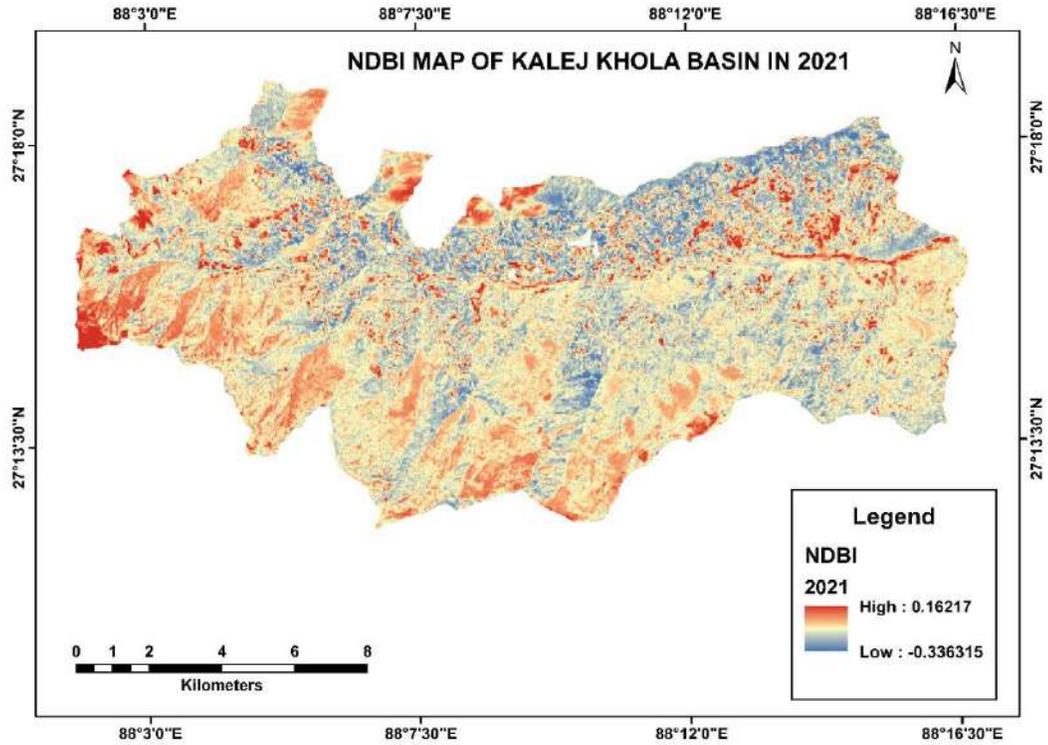
NDBI: To verify whether, the projected growth of built-up area is true NDBI is used. The Normalized Difference Built-up Index (NDBI) uses the NIR and SWIR bands to emphasize manufactured built-up areas. It is ratio based to mitigate the effects of terrain illumination differences as well as atmospheric effects.

$$\text{NDBI} = (\text{SWIR} - \text{NIR}) / (\text{SWIR} + \text{NIR})$$

In North-eastern, and southern part of Kalej Khola basin built-up area increased from 2012 to 2021. Also, in the Northwestern part of the basin there are lot more built-up area like settlement, roads croplands are built. Maximum NDBI value has undergone a rise from 0.15 in 2012 to 0.16 in 2021. This rising trend shows that there has been an increase in built-up area over time which make the basin more susceptible for landslides.

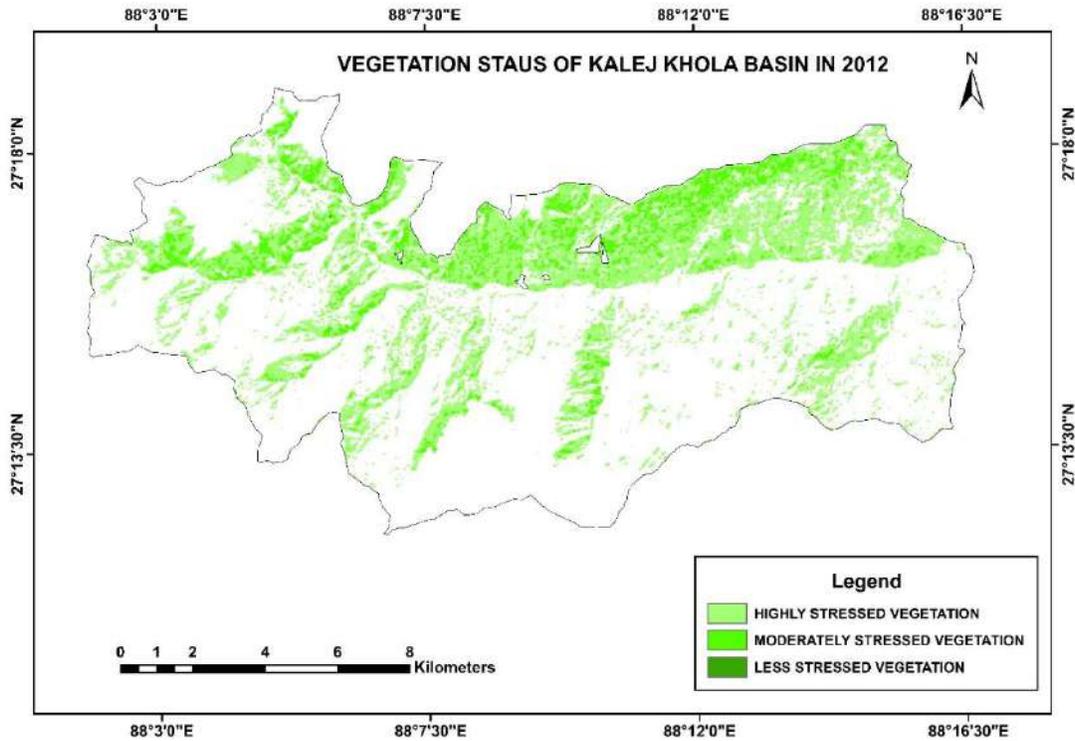


Map No 19. NDBI, Kalej Khola Basin, 2012

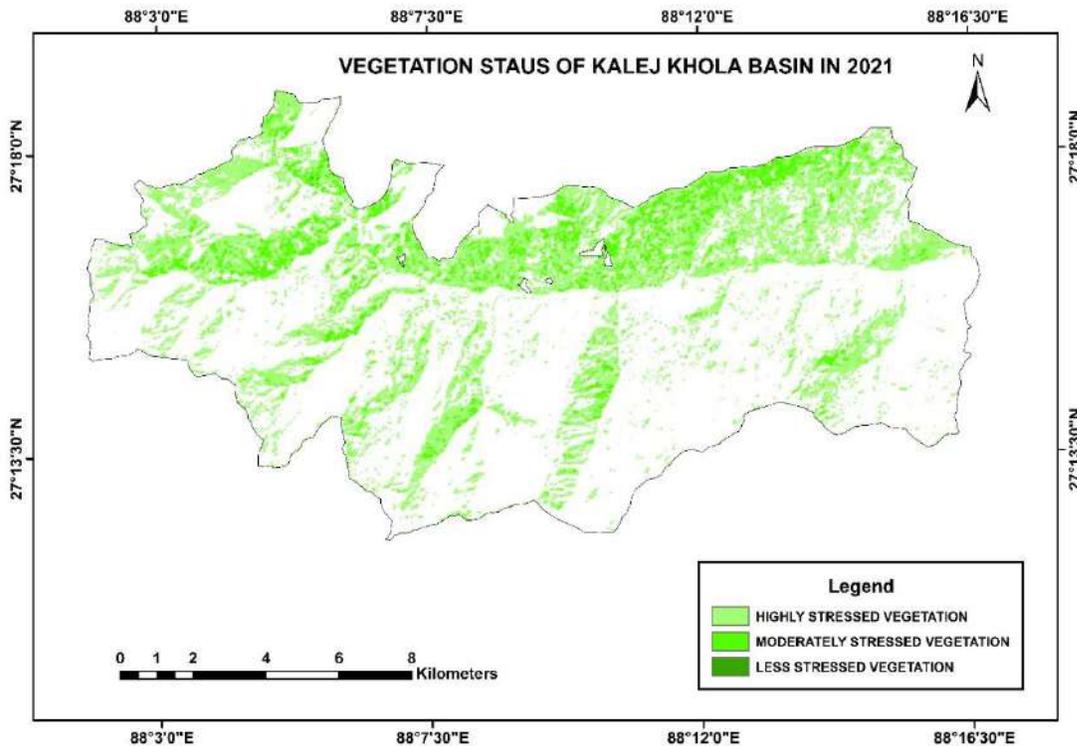


Map No 20. NDBI, Kalej Khola Basin, 2021

To further prove that vegetation health is one of the most important factors due to which the area remains susceptible to landslides, vegetation status of Kalej Khola basin has been studied. Here the area covered by different degrees of stressed vegetation has been analysed.



Map No. 21
Vegetation
Status, Kalej
Khola Basin, 2012



Map No 22.
Vegetation
Status, Kalej
Khola Basin,
2021

Area under highly stressed vegetation {Pixel range 0.3 to 0.4) was 47.20 Sq.Km in 2012 & increased to 48.33 Sq.Km in 2021.

Area under moderately stressed vegetation (pixel range 0.4 to 0.5) was 10.2 Sq.Km in 2012 & Decreased to 9.46 Sq.Km in 2021. The reason is the conversion of moderately stressed vegetation into highly stressed vegetation. Neither less stressed vegetation (pixel range 0.5 to 0.6) nor healthy vegetation (Pixel value more than 0.6) was noticed in both the year of 2012 and 2021.

Hence, it can be stated that in spite of being a rise in vegetation area over time, as seen from satellite data, the vegetation health has continued to remain poor. Most of the vegetation is stressed and is not strong enough to be bind the soil tightly to control landslides.

7) CONCLUSION:

With a series of ridges and valleys, undulating terrain and riverine landform, the Kalej Khola basin is marked by the occurrence of different geomorphological units, varied weathered phenomena, partly isolation, diversified topography formed by both endogenetic and exogenetic forces and variegated changing land use patterns. A careful study of landform, land potentiality along with land use development of the Kalej Khola basin with special reference to sustainable socio-economic developmental possibilities in all its important aspects both physical and cultural (macro, meso and micro level) have been accomplished by the worker. This is very important as the market town of Geyzing is present here and is a very important transit point. The transportation lines running from east to west is a main artery connecting this route. The roadway connects Legship to Pelling, which is a very important tourist spot. The more the traffic in this fragile environment, more is the tendency of the region to slide, provided other factors are present too. result of analysis and important observations on the influence of structure-tectonic processes including soil erosion, landscape and drainage characteristics, occurrences of natural resources with the related conflicts of man-made changes with land use planning with the increasing rate of population growth, influence the environmental degradation.

APPENDIX

TABLE NO:1

<u>TEMPERATURE (° C) DISTRIBUTION OF KALEJ KHOLA BASIN,2002-2003</u>												
STATION	JAN	FEB	MAR	APRIL	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC
Legship	19	20	22	24	25	27	29	28	26	24	22	21
Martam	18	19	21	22	24	26	28	27	25	23	22	20
Hee-Gaon	17	19	21	24	25	27	28	26	25	23	21	19
Dentam	15	16	18	20	21	22	24	25	23	21	19	16
Sapong	16	18	20	21	23	25	26	27	25	23	20	18
Gyalshing	17	18	21	25	26	27	27	28	26	24	21	19
Uttarey	11	12	14	16	18	21	21	23	21	19	15	21
Karmatar	12	13	15	16	18	20	22	23	21	19	16	16
Sopakha	7	9	11	12	15	16	17	15	14	11	9	8

Source: Based on Agricultural Department and Meteorological Department Gangtok. Sikkim. 2002-2003

TABLE NO:2

<u>RAINFALL (MM) DISTRIBUTION OF KALEJ KHOLA BASIN,2002-2003</u>												
STATION	JAN	FEB	MAR	APRIL	MAY	JUNE	JUL	AUG	SEP	OCT	NOV	DEC
Legship	20	30	40	180	280	480	620	580	440	1400	20	10
Martam	30	40	60	160	240	350	480	420	320	110	30	20
Hee-Gaon	40	30	70	120	200	360	520	460	370	120	25	15
Dentam	20	20	50	130	180	380	580	440	340	130	10	10

Sapong	30	40	60	110	180	340	480	380	290	90	20	10
Gyalshing	40	30	60	100	180	380	560	480	380	140	20	15
Uttarey	20	30	50	120	220	520	680	500	310	110	15	5
Karmatar	25	35	40	140	240	480	640	520	240	90	10	5
Sopakha	15	30	50	150	220	450	520	380	230	90	30	20

Source: Based on Agricultural Department and Meteorological Department Gangtok. Sikkim. 2002-2003

TABLE NO:3

AVERAGE TEMPERATURE (°C) AND AVERAGE RAINFALL (MM) DISTRIBUTION OF KALEJ KHOLA BASIN			
Sl. No.	STATION	AVERAGE TEMPERATURE(°C)	AVERAGE RAINFALL(MM)
1	Legship	24	<u>237</u>
2	Martam	<u>23</u>	<u>188</u>
3	Hee	<u>23</u>	<u>194</u>
4	Dentam	<u>20</u>	<u>191</u>
5	Sapong	<u>22</u>	<u>169</u>
6	Gyalshing	<u>23</u>	<u>199</u>
7	Uttarey	<u>17</u>	<u>215</u>
8	Karmatar	<u>18</u>	<u>205</u>
9	Sopakha	<u>12</u>	<u>182</u>

Source: Based on Agricultural Department and Meteorological Department Gangtok. Sikkim. 2002-2003

IMAGES OF KALEJ KHOLA BESIN



SLOPE IMAGE NO:1



SLOPE IMAGE NO:2



SETTLEMENT IMAGE NO:3



SETTLEMENT IMAGE NO:4



NATURAL VEGETATION IMAGE NO:5



LANDSLIDE CHANNEL PATTERN IMAGE NO:7

CROP LAND IMAGE NO:6



STRAM IMAGE NO:8

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BHAIRAB GANGULY COLLEGE



*WEST BENGAL STATE
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M.SC IN GEOGRAPHY
4TH SEMESTER EXAMINATION
KABITA KARMAKAR
SESSION: 2019-2021
INTERNAL COPY
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GEOPDSE04P: B

UNIT -1

Contemporary research trend

In the Indian context, villages are the heart of the nation but still it is growing fact that the rural population is suffering more consequences for livelihood as compared to urban areas. The difficulties of livelihood may be forcing rural population to migrate to the urban areas which is one of the major challenge. If situation remains same, urban growth will be unavoidable, as the economic pursuits and aspirations of the population always change and evolve.

Village developmental activities and plans were formulated by government in order to mitigate poverty, unemployment, illiteracy, malnutrition in kids, health problem and also to provide basic needs of livelihood. However, due to lack of implementation, many villages are still deprived of drinking water, sanitation facilities, primary health centers, equipped primary schools, electricity, proper road and public transportation system, banks and communication services. All these programs and Policy have met with limited success. The “Smart Village” concept could address these challenges comprehensively. All these programme and policies can converge in smart village development by adding smart solutions.

Research

What is Research?

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words, research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.

What is Inductive Method ?

Inductive approaches are associated with qualitative research What is Deductive Method

Deductive approaches are associated with quantitative research

What is Qualitative Research ?

Qualitative research involves collecting and analyzing nonnumerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.

What is Quantative Research ?

Quantitative research is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations

Methods of Qualitative Research

Observations Recording what you have seen, heard, or encountered in detailed field notes.

Interviews Personally asking people questions in one-on-one conversations.

Focus groups Asking questions and generating discussion among a group of people.

Methods of Quantative Research

Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computational techniques.

Characteristics of Good Research

- Good research follows a systematic approach to capture accurate data.
- Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
- The analysis is based on logical reasoning and involves both inductive and deductive methods.
 - Real-time data and knowledge is derived from actual observations in natural settings.
- There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
 - It creates a path for generating new questions. Existing data helps create more research opportunities.
- It is analytical and uses all the available data so that there is no ambiguity in inference.

Research data

Valid – founded, logical, rigorous, and impartial.

Accurate – free of errors and including required details.

Reliable – other people who investigate in the same way can produce similar results.

Timely – current and collected within an appropriate time frame.

Complete – includes all the data you need to support your business decisions.

Literature search on research problem stated

- Do literature review
- Identify research gap.
- Identify research problem.
- Do the research.

Framing research question and hypothesis

- Identify research gap. -Selection of method.
- Specific assumption.
- Test the assumption.
- End result.
- Give suggestion.

Null hypothesis Alternative hypothesis

Selecting study area and target population

- Identify the problem of a specific study area.
- No previous work on that problem.
- Select the problem for mitigation.
- Identify the victimized people.
- Do primary survey.
- Mitigate the problem.
- Do the research.

Collection of data

- Visit several websites.
- Visit several govt. offices.
- Justify authenticity and validity of the data.
- Check the research requirements.
- Always update yourself about the availability of the data.
- Make research objective flexible enough to match the requirement of the data

Development of a Schedule

Preliminary Study on Research Topic



Preliminary field visit



Identification of the Problem



Literature Review



Field visit



Collection of used schedule



Preparation of master schedule



Validation of the schedule



Testing the reliability of the schedule by a panel of experts



Application of the schedule



Removal of few questions for inconsistency and lack of proper answer in the field



Finalized schedule and ready for use, application during field survey

PREPARING SURVEY SCHEDULE AND QUESTIONNAIRE

QUESTIONNAIRE IN RESEARCH METHODOLOGY

A questionnaire can be a useful tool for gathering information. It can be used for survey research, gathering data or testing a hypothesis. For a questionnaire to be effective and give you the information you are looking for, you will need to design a survey that is easy to understand and easy to complete. A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. The questionnaire was invented by Sir Francis Galton. A questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in by himself. It consists of a number of questions printed or typed in a definite order. These forms are actually mailed to the respondent who was expected to read and understand the questions and reply to them by writing the relevant answers in the spaces provided. Ideally speaking respondent must answer to a verbal stimulus and give a written or verbal response. It is totally devoid of any table. Its purpose is to collect information from the respondents who are scattered over a vast area. Goode and Hatt have defined questionnaire as a device for securing answers to questions by using a form which the respondent fills himself. According to Barr, Davis and Johnson "A questionnaire is a systematic compilation of questions that are submitted to a sampling of population from which information is desired". In educational researches, the questionnaire consists of a sense of questions or statements to which individuals are asked to respond the questions frequently asked for facts or the opinions, attitudes or preferences of the respondents. Beginners are more commonly tempted to this tool, because they imagine that planning and using a questionnaire is easier than the use of other tools. It is also considered to be the most flexible of tools and possesses a unique advantage over others in collecting both qualitative and quantitative information. Critics speak of it as the lazy man's way of gaining information, because it is comparatively easy to plan and administer a questionnaire. As a matter of fact, preparation of a good questionnaire takes a great deal of time, ingenuity and hard work.

DIFFERENCE BETWEEN QUESTIONNAIRE AND SCHEDULE

DEFINITION OF QUESTIONNAIRE:

We define questionnaire as an instrument for research, which consists of a list of questions, along with the choice of answers, printed or typed in a sequence on a form used for acquiring specific information from the respondents.

The questionnaire is prepared in such a way that it translates the required information into a series of questions, that informants can and will answer. Further, it should be such that the respondent gets motivated and encouraged, to make him engaged in the interview and complete it. The merits of questionnaires are discussed below:

- It is an inexpensive method, regardless of the size of the universe.
- Free from the bias of the interviewer, as the respondents answer the questions in his own words.
- Respondents have enough time to think and answer.

DEFINATION OF SCHEDULE:

The schedule is a proforma which contains a list of questions filled by the research workers or enumerators, specially appointed for the purpose of data collection. Enumerators go to the informants with the schedule, and ask them the questions from the set, in the sequence and record the replies in the space provided. There are certain situations, where the schedule is distributed to the respondents, and the enumerators assist them in answering the questions.

This method is little expensive as the selection, appointment and training of the enumerators require a huge amount. It is used in case of extensive enquiries conducted by the government agencies, big organisations. Most common example of data collection through schedule is population census.

DIFFERENCE:

The important points of difference between questionnaire and schedule are as under:

1. The questionnaire is one of the methods used for data collection. The questionnaire will have many questions, with each question having multiple choices. The schedule is also one of the methods of data collection. It will have a set of statements, questions and space given to note down the answers.
2. Questionnaire method of data collection is preferred when the respondents are willing to cooperate. In addition, to deploy this method the respondents need to be literate.

The Schedule method of data collection can be utilised irrespective of the respondent's literacy. It can be used when the respondents are literate and can be used even when the respondents are illiterate.

3. The type of technique used in the Questionnaire method is Quantitative. The type of technique used in the Schedule method is Qualitative.
4. In the Questionnaire method, the grouping is made on the basis of different categories like location, age, gender etc. In the schedule method of data collection, the grouping may exist or may not exist.

5. Informants receive questionnaires through emails, posts and the answers will be given as per instructions given in the cover letter. Answers in the Schedule method of data collection are filled by research workers/enumerators.
6. In the Questionnaire method, there is no scope for direct personal contact with the respondents. In the Schedule method, there is direct personal contact of the respondents with the enumerators.
7. The cost incurred in the questionnaire method of data collection is economical in comparison with the schedule. The cost is less even if the sample size used is very large. Predominantly the money is spent on preparing questionnaires only. The cost incurred in the Schedule method of data collection is very expensive since there is the cost involved in preparing the schedule, cost incurred on enumerators in addition to the training imparted to them.
8. The coverage of Questionnaire method is large as the questionnaires can even be sent to respondents who are not easily accessible. The coverage of this method is relatively small as there are constraints in sending enumerators to larger areas.
9. In the questionnaire, there is a higher possibility of collecting wrong or incomplete information when respondents are unable to have a clear understanding of the given question.

As everything has two aspects, so as with the case of questionnaire and schedule. The risk of collection of inaccurate and incomplete information is high in the questionnaire, as it might happen that people may not be able to understand the question correctly. On the contrary, schedule faces the risk of biases and cheating of the interviewer.

ISSUES ON FIELD RESEARCH

FIELD RESEARCH:

Field research is defined as a qualitative method of data collection that aims to observe, interact and understand people while they are in a natural environment. For example, nature conservationists observe behavior of animals in their natural surroundings and the way they react to certain scenarios. In the same way, social scientists conducting field research may conduct interviews or observe people from a distance to understand how they behave in a social environment and how they react to situations around them.

Field research encompasses a diverse range of social research methods including direct observation, limited participation, analysis of documents and other information, informal interviews, surveys etc. Although field research is generally characterized as qualitative research, it often involves multiple aspects of quantitative research in it.

Field research typically begins in a specific setting although the end objective of the study is to observe and analyze the specific behavior of a subject in that setting. The cause and effect of a certain behavior, though, is tough to analyze due to presence of multiple variables in a natural environment. Most of the data collection is based not entirely on cause and effect but mostly on correlation. While field research looks for correlation, the small sample size makes it difficult to establish a causal relationship between two or more variables.

Methods of Field Research:

Field research is typically conducted in 5 distinctive methods. They are:

- **Direct Observation:**

In this method, the data is collected via an observational method or subjects in a natural environment. In this method, the behavior or outcome of situation is not interfered in any way by the researcher. The advantage of direct observation is that it offers contextual data on people, situations, interactions and the surroundings. This method of field research is widely used in a public setting or environment but not in a private environment as it raises an ethical dilemma.

- **Participant Observation:**

In this method of field research, the researcher is deeply involved in the research process, not just purely as an observer, but also as a participant. This method too is conducted in a natural environment but the only difference is the researcher gets involved in the discussions and can mould the direction of the discussions. In this method, researchers live in a comfortable environment with the participants of the research, to make them comfortable and open up to in-depth discussions.

- **Ethnography:**

Ethnography is an expanded observation of social research and social perspective and the cultural values of an entire social setting. In ethnography, entire communities are observed objectively. For example, if a researcher would like to understand how an Amazon tribe lives their life and operates, he/she may chose to observe them or live amongst them and silently observe their day-to-day behavior.

- **Qualitative Interviews:**

Qualitative interviews are close-ended questions that are asked directly to the research subjects. The qualitative interviews could be either informal and conversational, semi-structured, standardized and open-ended or a mix of all the above three. This provides a wealth of data to the researcher that they can sort through. This also helps collect relational data. This method of field research can use a mix of one-on-one interviews, focus groups and text analysis.

- **Case Study:**

A case study research is an in-depth analysis of a person, situation or event. This method may look difficult to operate. However, it is one of the simplest ways of conducting research as it involves a deep dive and thorough understanding the data collection methods and inferring the data.

✚ PILOT STUDY BASED ON QUESTIONNAIRE:

The Concise Oxford Thesaurus defines a pilot study as on experimental exploratory, test, preliminary, trial or try out investigation. Pilot test is a trial collection of data to detect weaknesses in design and instrument and provide proxy data for selection of a probability sample. A pilot survey is a mini-survey where the researcher sends out a questionnaire to a smaller sample size compared to the actual target audience. By collecting information from a convenience sample, we can predict the response patterns of participants and make any required changes to our research.

Reasons for Conducting Pilot Study:

The main reasons for conducting a pilot study are:

- **Process:** This assesses the feasibility of the process that are key to the success of the main study
- **Resources:** This deals with assessing time & resource problems that can occur during the main study.
- **Management:** This covers potential human & data management problems.
- **Scientific:** This deals with the assessment of the response, effect & variance of the effect
- **Other Reasons:**
 - Developing & testing adequacy of research instrument
 - Assessing the feasibility of a full scale study /survey
 - Establishing whether the sampling frame & technique are effective collecting preliminary data.

- Determining what resources are needed for a planned study
- Assessing the proposed data analysis techniques to uncover potential problems.
- Developing a research question & research plan.
- Convincing funding bodies & other stakeholders that the main study is worth supporting.

Advantages of a Pilot Study:

The advantages of a pilot study are:

- It permits preliminary testing of hypothesis that leads to testing more precise hypotheses in the main study. It may lead to changing some hypotheses, dropping some or developing new hypotheses.
- It often provides the researcher with ideas, approaches & clues the researcher may not have foreseen before conducting the pilot study. Such ideas & clues increase the chances of getting clearer findings in the main study.
- It permits a thorough check of the planned statistical & analytical procedures, giving a researcher a chance to evaluate their usefulness to the data. The researcher may then be able to make needed alterations in the data collecting methods & therefore analyze data in the main study more efficiently.
- It can greatly reduce the number of unanticipated problems because the researchers have all opportunity to redesign parts of his/her study to overcome difficulties that the pilot study reveals.
- It may save lot of time & money. The pilot study almost always provides enough data for the researcher to decide whether to go ahead with the main study.
- In the pilot study, the researcher may try out a number of alternative measures & then select those that produce the clearest results for the cleanest results for the main study.
- The less research experience the student has, the more she/he is likely to benefit from a pilot study. Because of that possibility, the student should attempt a pilot study whenever possible.

Problems of Pilot Study:

- Possibility of making inaccurate predictions or assumptions on the basis of pilot data.
- Completing a pilot study successfully is not a guarantee of the success of the full scale survey. Although pilot study findings may offer some indication of the likely size of response rate in the main survey, they cannot guarantee this because they do not have a statistical foundation & are nearly always based on small numbers.
- A further concern is that of contamination. This may arise in two ways :
 - a) Where data from pilot study are included in the main results
 - b) Where pilot study are included in the main study, but new data are collected from these people.
- A more common problem is deciding whether to include pilot study participants in the main study.
- Problems may also arise where a pilot study requires significant investment and resources, making it difficult for the study team or researcher to call a halt to the research after an unsuccessful pilot study.

ETHNOGRAPHIC FIELD DIARY:

Field Diary:

The field diary is the basic document which contains all the data collected. It refers to qualitative notes recorded by researchers in the course of field research, during or after their observation of a specific phenomenon they are studying. The notes are intended to be read as evidence that gives meaning and aids in the understanding of the phenomenon. Field notes allow the researcher to access the subject and record what they observe in an unobtrusive manner.

Ethnographic Field Note/ Diary:

Ethnographic field note is considered the most important field text collection method in qualitative research, and it is basically a primary method of taking field text for an ethnographic study. In fact, an ethnographic research requires more descriptive and interpretive field text analysis about the researched participants focusing on the cultural aspects in a natural setting. The goal of ethnographic research is thus to formulate a pattern of analysis that makes reasonable sense out of human actions within the given context of specific time and place (Fife, 2005). Thus, an ethnographer applies a different method to address the problem of the research. The best approach to collect empirical field text from the field is by writing field notes. Whether an ethnographer conducts formal interviews, informal interviews, observation, focus group discussions, key informant interviews or overheard conversations, writing the field notes is virtually a significant way for the researcher to record the data (Dewalt & Musante, 2010). If the ethnographers do not write it down in their field notes, recording data may not be possible. Thus, the field note writing is the most important means of documenting field data in an ethnographic research.

In order to record as much as possible, it is important to include as much information as possible in your field notes. Chiseri-Strater and Sunstein (1997) have developed a list of useful things that should be included in all field notes:

- Date, time, and place of observation
- Specific facts, numbers, details of what happens at the site
- Sensory impressions: sights, sounds, textures, smells, taste
- Personal responses to the fact of recording fieldnotes
- Specific words, phrases, summaries of conversations, and insider language
- Questions about people or behaviors at the site for future investigation
- Page numbers to help keep observations in order

There are many other methods by which we can record ethnographic field text. Field notes remain a central method in ethnography even though modern technologies such as cameras and audio recorders may seem to be better at capturing information and easier to use (Madden, 2010). An ethnographer could use modern tools and techniques in writing the field note such as Instagram and Vivo. Many would say that typing notes directly into a laptop is now equivalent to handwriting, and they are probably correct (Madden, 2010).

In the 21st century, researchers have been using many gadgets in the research. To be skillful in ethnographic field notes writing using pen and pencil is still significant for the ethnographers. The ethnographers need to see the context of the field, ethical aspect and technical part of the successful

field text collection. The aim of the field work is to produce comprehensive field texts that help to produce a reliable thesis. On the other hand, the development countries are also importing modern technology due to the revolution in digital world. As a result the research participants in the developing countries are also aware of the emerging technology. In light of the problems associated with writing field notes, particularly in the context of interviews, the advantages of audio-recording, and perhaps even video-recording, are obvious (Hammersley & Atkinson, 2008). Despite the revolution in the digital technology there are both challenges and opportunities to use them in the research field. Due to the poor knowledge and skill on the use of modern technology the hand written field note method is still significant in research.

LONGITUDINAL STUDY & CASE STUDY RESEARCH:

LONGITUDINAL STUDY:

A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. As longitudinal studies are observational, there will be no interference with the respondents or subjects if it happens to be a survey. They are unique from other types of research because of their timeline. This means that the same subjects are observed multiple times (often in the course of many years), instead of the researchers trying to collect data from various subjects with the aim to study the same variables. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Types of Longitudinal Research:

There are three major types of longitudinal studies:

- **Panel study:** Involves sampling a cross-section of individuals.

- **Cohort study:** Involves selecting a group based on a specific event such as birth, geographic location, or historical experience.
- **Retrospective study:** Involves looking to the past by looking at historical information such as medical records.

Advantages of Longitudinal Studies:

- One key advantage of performing longitudinal studies is their **ability to show patterns of a variable over time**, which is a very powerful way through which researchers come to learn about the relationships of cause and effect.
- With a **clear focus**, longitudinal studies would see how a particular end state or a set of circumstances would come to be. And though people usually might not remember past events, it can be solved by means of actual recording, thus ensuring a high level of **validity**.
- A longitudinal study is unique in itself in terms of its ability to **provide useful data** about individual changes.
- As most longitudinal studies use the observation method (they observe the state of the world without manipulating it), it has been argued that they may have less power in detecting causal relationships than experiments. However, because of the repeated observations they use at individual levels, they have **more power than cross-sectional observational studies** in terms of being able to exclude time-invariant, unobserved individual differences and in terms of observing a certain event's temporal order.
- A longitudinal study is often used in studying **developmental trends** across life spans and in studying life events throughout generations or lifetimes. This is primarily because, unlike a cross-sectional study, in which different individuals with same characteristics are compared, a longitudinal study would track the same people, thus the differences observed in the group will be less likely to be the result of a cultural difference across generations.
- Because they are perfect for doing research on developmental trends, longitudinal studies can make **observation of changes** more accurate, making them a more preferred method in various fields.
- Longitudinal studies allow for **flexibility** to occur, which means their focus can be shifted while data is being collected.

Disadvantages of Longitudinal Studies:

- One of the biggest drawbacks of performing longitudinal studies is **panel attrition**. If you are only depending on the same group of subjects for a study that takes place once in a while for years, some of these subjects will obviously no longer be able to participate due to various reasons, such as refusal, changes in contact information and death, which cuts down useable data that can be drawn for an ultimate conclusion.
- Another huge drawback to any longitudinal study is the great amount of time it needs to collect all the data that is needed. Usually, it **takes a long period of time** to gather results before you can start making patterns.
- They would gather **data that is not that reliable**. While longitudinal data is collected at multiple points, these observation periods are pre-determined and cannot be taken into account no matter what happens between these points. Aside from this, there is also the idea of panel conditioning, where respondents can often unknowingly change their qualitative responses over time to better fit

what they consider to be the intended goal of the observer. The process of longitudinal studies itself has changed how subjects or respondents view the questions used.

- They **require a large sample size**. It means that such studies should have a large number of subjects who are willing to cooperate.
- It is known that **cross-sectional studies are more affordable compared to longitudinal studies**. With fewer touch points, the former are also much quicker in reaching an observational conclusion. Considering they use a carefully chosen sample size, they can be more helpful in representing entire populations, instead of using subsets, which can be very beneficial when it comes to considering a policy change.

❖ **CASE STUDY RESEARCH:**

A case study is an effective research method that specifically studies a single case over a period of time. Case studies are research methodologies that are used and analyzed in order to depict principles. Case studies seek to explain and give details in the analysis of people and events. Writing a case study is a very useful form of study in the educational process.

Characteristics of Case Study Research:

Particularistic Phenomenon: A case study researcher may specifically choose a particular instance of phenomenon under investigation to understand a specific problem that occurs in everyday practice.

Descriptive Phenomenon: Descriptive phenomenon means that the end result of the case study, the narrative, includes ‘thick description’ of the phenomenon, including many variables and analyses of the interactions.

Heuristic Phenomenon: Heuristic refers to the fact that case studies ‘illuminate the readers’ understanding of the phenomenon under study’ beyond the readers’ original knowledge.

Types of Case Study:

There are 4 types of case studies used for different purposes. The main purpose of case studies is to analyze problems within the boundaries of a specific organization, environment, or situation. According to design, case studies can be divided into the following categories:

- **Illustrative Case Study:** An illustrative case study is used to examine a familiar case in order to help others to understand it. It is one of the main types of case studies in research methodology and is primarily descriptive. In this type of case study, usually, one or two instances are utilized to explain what a situation is like.
- **Exploratory Case Study:** An exploratory case study is a primary project conducted before a large scale investigation. These types of case studies are very popular in the social sciences and primarily focus on real-life contexts and situations. Typically, these are used to identify research questions and methods for a large and complex study. The main purpose of an exploratory case study is to help identify situations for the further research process.
- **Cumulative Case Study:** A cumulative case study is one of the main types of case studies in qualitative research. It is used to collect information from different sources at different times. The

aim of this case study is to summarize the past studies without spending additional cost and time on new investigations.

- **Critical Instance Case Study:** Critical instances case studies are used to determine the cause and consequence of an event. The main reason for this type of case study is to investigate one or more sources with unique interest and sometimes with no interest in general. A critical case study can also be used to question a universal assertion.

Types of Subjects of Case Study:

In general, there are four types of case studies and 5 types of subjects they address. Every case study whether exploratory, critical, or cumulative, fits into the following subject categories.

- **Person:** This type of study focuses on one subject or individual and can use several research methods to determine the outcome.
- **Group:** This type of study takes into account a group of individuals. This could be a group of friends, coworkers, or family.
- **Location:** The main focus of this type of study is the place. It also takes into account how and why people use the place.
- **Organization:** This study focuses on an organization or company. This could also include the company employees or people who work in an event at the organization.
- **Event:** This type of study focuses on a specific event. It could be societal or cultural and examines how it affects the surroundings.

Pros & Cons:

There are several pros that back case studies and there are cons too that criticize them. The pros and cons are listed below.

- **Pros:**
 - They show client observations-Since case studies are strategies that are used and analyzed in order to describe principles therefore it seeks show indeed the client investigated and experienced a particular phenomenon.
 - Makes practical improvements-Case studies present facts that categorically describe particular people or events in order to make some of the necessary improvements. Case studies data is what supports a particular belief.
 - They are an influential way of portraying something-If a researcher wants to prove a particular principle to be true, he or she must back it by case studies in order to make the other people and the naysayers believe.
 - They turn opinions into facts-Case studies present real data on a particular phenomenon. Since, facts about various things are presented then it can be verified through this kind of data if the information presented is in the positive or negative development of opinion.

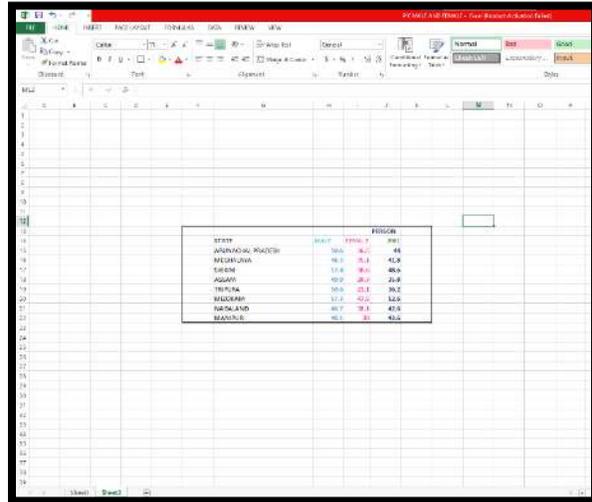
- It is relevant to all the parties that are involved-Case studies help the researchers in actively focusing on the data collection process and the participants' knowledge is bettered. At the end of the process, everybody is able to defend his position through facts.
 - A number of different research methodologies can be used in case the studies-Case study method goes beyond the interview and direct observations. Secondary data can be obtained from various historical sources that can be used to back the method.
 - 7. Case studies can be done remotely-It is not essential for a researcher to be present in the specific location of the study in order to effectively use the case study method. Other forms of communication come in to cover that gap for the researcher.
 - 8. It has a very high cost-If you put this research method in comparison to the others, this one seems more expensive because the cost of accessing data is very high.
 - 9. Readers can access data from this method very easily-The format in which case studies present their data is very useful to the readers and easily note the outcomes of the same.
 - 10. Collects data that cannot be collected by another method- The type of data collected by case studies is much richer and greater in-depth than that of the other experimental methods.
- **Cons:**
- Data collected cannot be generalized- The data collected by the case study method was collected from a smaller population it cannot be generalized to the wider population.
 - Some of the case studies are not the scientific-The weakness of the data collected in some of the case studies that are not scientific is that it cannot be generalized.
 - It is very difficult to draw a definite cause/effect from case studies-The the kind of data that case studies present cannot be used to draw a definite cause-effect relationship.
 - Case studies concentrate on one experiment-The problem associated with concentrating on one experiment or a specific group of people is that the data presented might contain some kind of bias.
 - It takes a lot of time to analyze the data-This process takes longer to analyze the data because there is a very large amount of data that must be collected. Participants might take a lot of time in giving answers or giving inaccurate information.
 - Case studies can be inefficient processes-Sometimes the researchers are not present at the study areas, which means they will not be able to notice whether the information provided is accurate or not terming the whole process inefficient.
 - Case study method can only be effective with a small sample size-If a very large sample size is involved in the case study it is likely for it to become inefficient because the method requires a small sample size to get the data and analyze it.
 - The method requires a lot of labor in data collection-The researcher is seriously needed in the data collection of this method. They have to be personally involved in order to be able to identify the quality of the data provided.

- There are factors that can influence the data- The method of data collection is meant to collect fact-based data but the power to determine what fact is and what is not is the person who is collecting the data.
- There is no right answer in case studies-Case studies do not present any specific answer that is right, the problem arises in the validation of solutions because there is more than one way of looking at things.

UNIT : 3

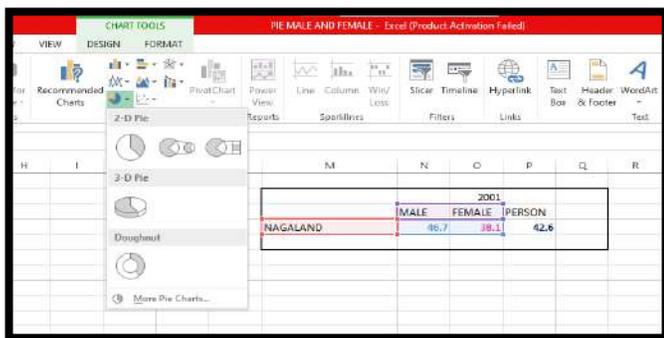
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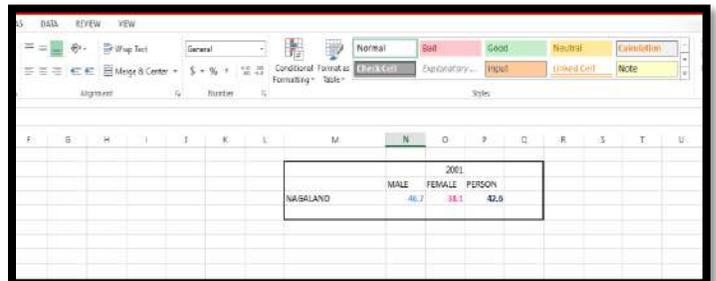


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ARUNACHAL PRADESH	48.0	38.0	42.0
ASSAM	51.0	41.0	46.0
BIHAR	50.0	40.0	45.0
CHHATTISGARH	52.0	42.0	47.0
GUJARAT	53.0	43.0	48.0
HARYANA	54.0	44.0	49.0
KARNATAKA	55.0	45.0	50.0
KERALA	56.0	46.0	51.0
MAHARASHTRA	57.0	47.0	52.0
MEGHALAYA	49.0	39.0	44.0
MIZORAM	50.0	40.0	45.0
NAGALAND	48.0	38.0	42.0
ODISHA	51.0	41.0	46.0
PUNJAB	52.0	42.0	47.0
RAJASTHAN	53.0	43.0	48.0
TAMIL NADU	54.0	44.0	49.0
TELANGANA	55.0	45.0	50.0
WEST BENGAL	56.0	46.0	51.0

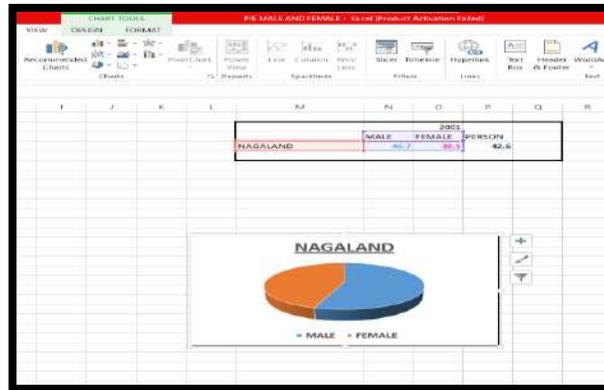
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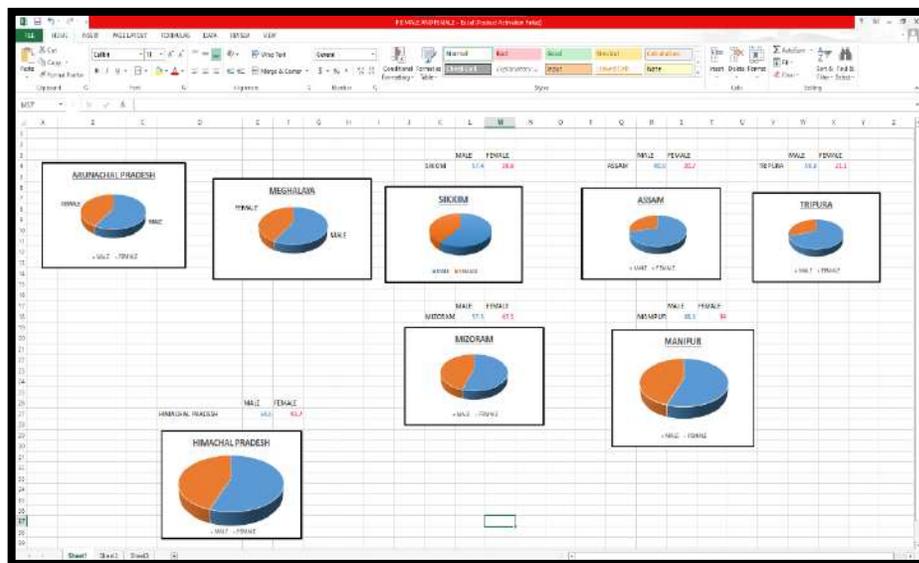
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		MALE	FEMALE	PERSON
NAGALAND		48.7	38.1	42.6



		2001		
		MALE	FEMALE	PERSON
NAGALAND		48.7	38.1	42.6



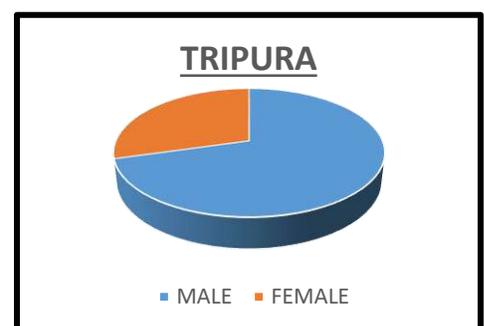
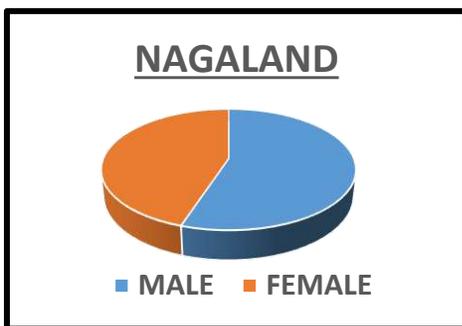
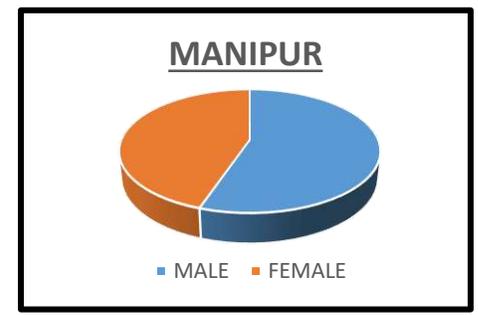
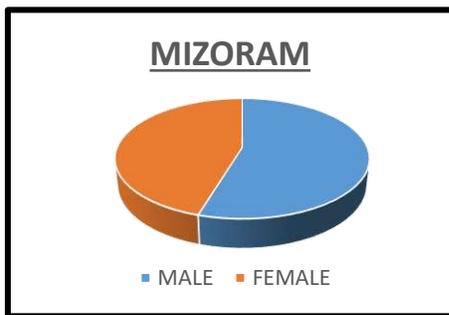
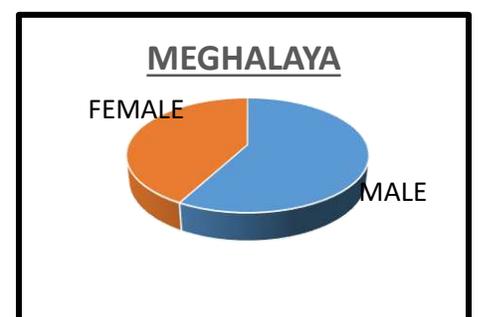
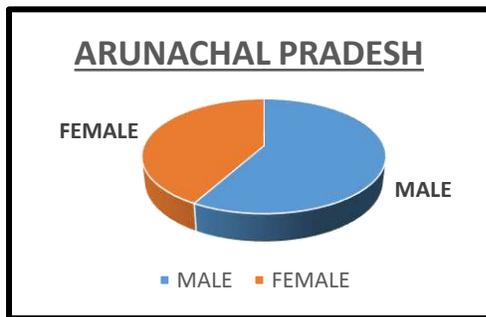
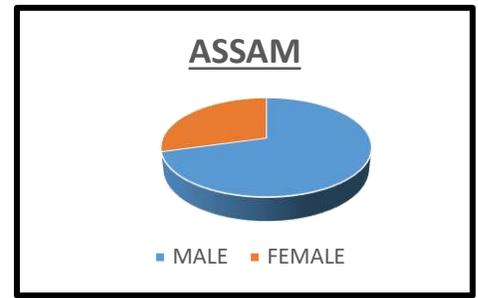
3. Do all 8 pie graph as per the 8 states data



**CALCULATION TABLE OF MALE AND FEMALE
POPULATION IN NORTHERN STATE OF INDIA (2011)**

		MALE	FEMALE	PERSON	
	STATE			2001	
	ARUNACHAL PRADESH	50.6	36.5	44	
	MEGHALAYA	48.3	35.1	41.8	
	SIKKIM	57.4	38.6	48.6	
	ASSAM	49.9	20.7	35.8	
	TRIPURA	50.6	21.1	36.2	
	MIZORAM	57.3	47.5	52.6	
	NAGALAND	46.7	38.1	42.6	
	MANIPUR	48.1	39	43.6	

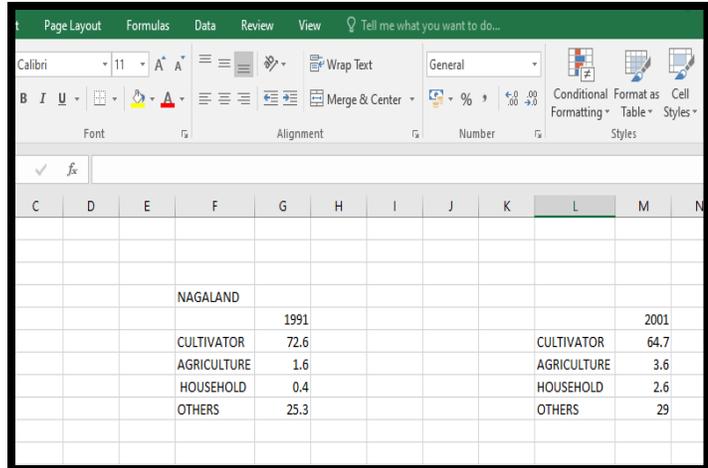
PIE DIAGRAM SHOWING MALE FEMALE DISTRIBUTION OF POPUYLATION IN NORTHERN STATE OF INDIA (2011)



CALCULATION TABLE FOR OCCUPATIONAL STRUCTURE
IN NORTHERN STATE OF INDIA (2011)

STATES	CULTIVATORS		AGRICULTURAL LABOURERS		HOUSEHOLD INDUSTRY WORKERS		OTHER WORKERS	
	2001	1991	2001	1991	2001	1991	2001	1991
ARUNACHALPRADESH	57.8	60.8	3.9	5.4	1.3	0.2	37.0	33.7
ASSAM	39.1	54.8	13.2	12.6	3.6	1.0	44.0	31.7
MANIPUR	40.2	59.9	12.0	10.3	10.3	6.0	37.6	23.8
MEGHALAYA	48.1	56.3	17.7	13.0	2.2	0.4	32.0	30.3
MIZORAM	54.9	62.3	5.7	5.4	1.5	1.1	37.9	31.2
NAGALAND	64.7	72.6	3.6	1.6	2.6	0.4	29.0	25.3
TRIPURA	27.0	39.0	23.8	24.2	3.0	1.6	46.1	35.2
SIKKIM	49.9	58.0	6.5	8.2	1.6	0.8	42.0	33.1
WEST BENGAL	18.4	25.0	31.0	36.2	5.4	3.6	45.3	35.2

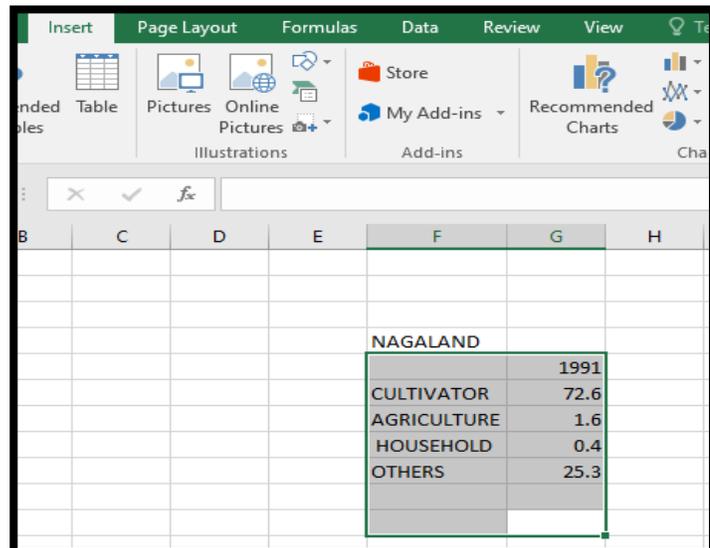
STEP 1: open the excel sheet.
Then put the data in excel.



The screenshot shows an Excel spreadsheet with the following data:

	1991	2001
NAGALAND		
CULTIVATOR	72.6	64.7
AGRICULTURE	1.6	3.6
HOUSEHOLD	0.4	2.6
OTHERS	25.3	29

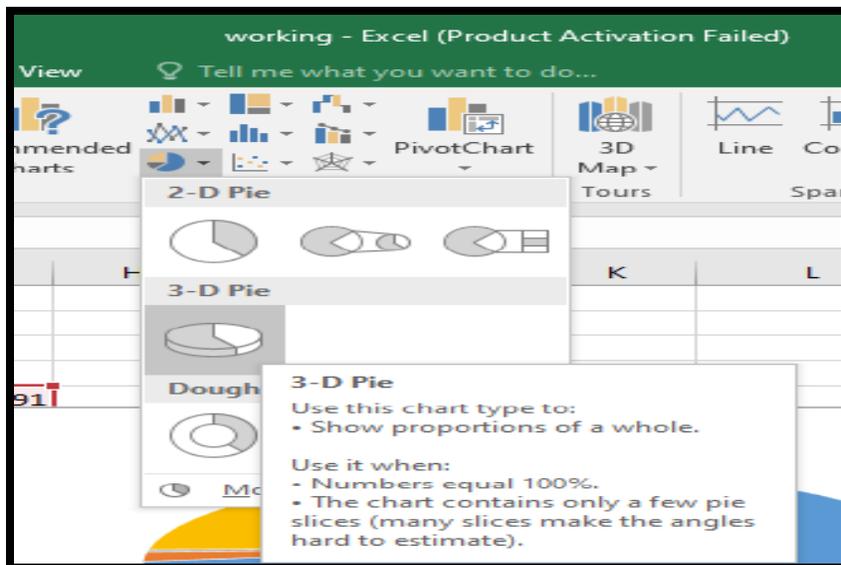
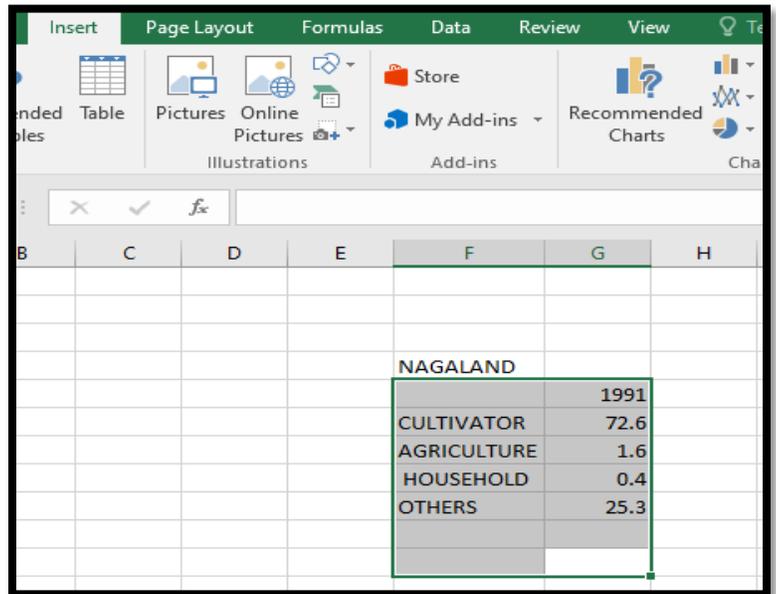
STEP 2: Then select the data.



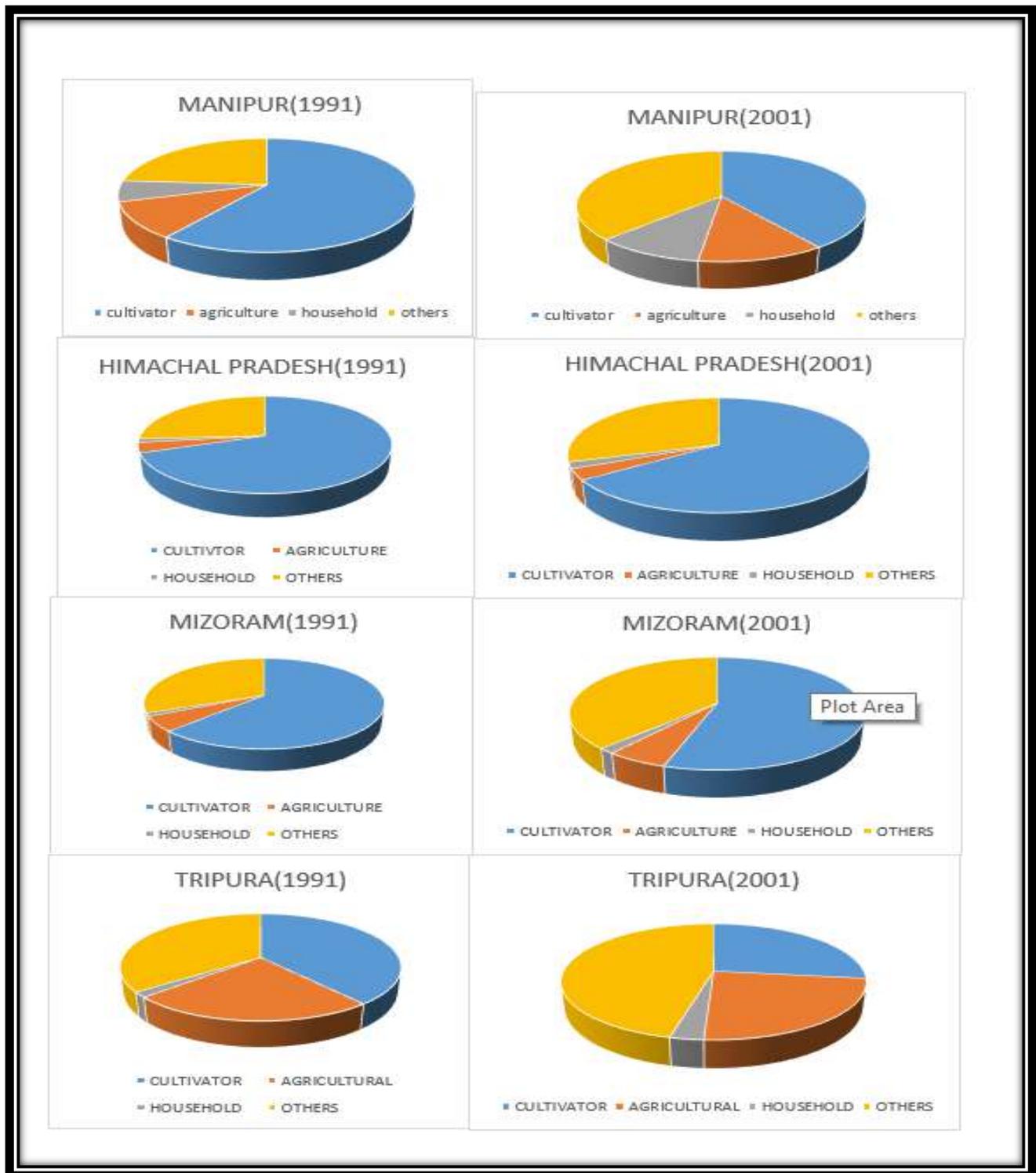
The screenshot shows the same data as the previous image, but the data for Nagaland is now selected. The selected data is:

	1991
NAGALAND	
CULTIVATOR	72.6
AGRICULTURE	1.6
HOUSEHOLD	0.4
OTHERS	25.3

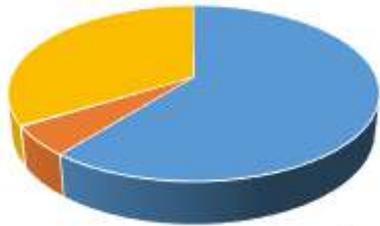
STEP 3: after select the data, then go to insert > then pie diagrams and finally showing the pie diagram.



PIE DIAGRAM SHOWING OCCUPATIONAL STRUCTURE IN NORTHERN STATE OF INDIA (2011)

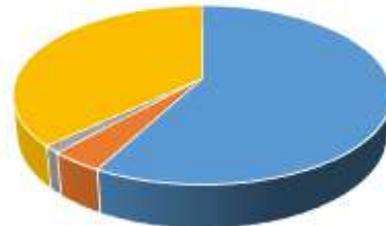


ARUNACHALPRADESH(1991)



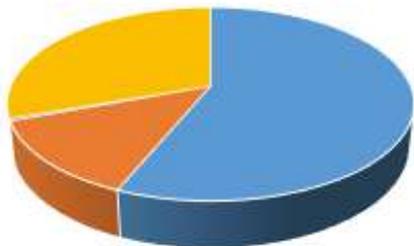
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ARUNACHALPRADESH(2001)



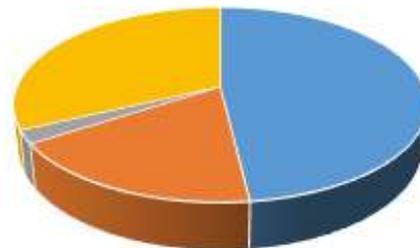
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

MEGHALAYA(1991)



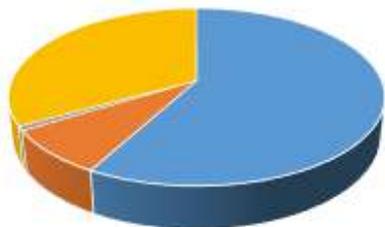
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

MEGHALYA(2001)



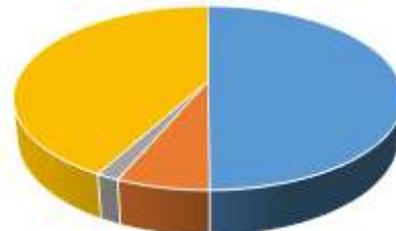
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

SIKKIM(1991)



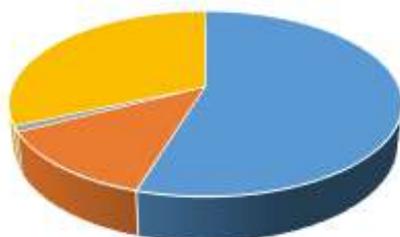
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

SIKKIM(2001)



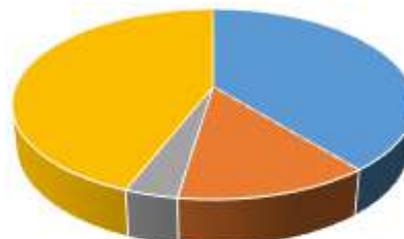
■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ASSAM(1991)



■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

ASSAM(2001)



■ CULTIVATOR ■ AGRICULTURAL ■ HOUSEHOLD ■ OTHERS

POPULATION COMPOSITION



AGE AND SEX PYRAMID

1. put the data on excel sheet

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E
1	Age Group	Male	Female	Total	% f
2	00-04	3743862	3589281	7333143	
3	05-09	4216763	4031046	8247809	
4	10-14	4677506	4479017	9156523	
5	15-19	4702325	4355706	9058031	
6	20-24	4422630	4335692	8758322	
7	25-29	4044904	3953005	7997909	
8	30-34	3464659	3376931	6841590	
9	35-39	3523361	3489285	7012646	
10	40-44	3219604	2933456	6153060	
11	45-49	2814212	2521507	5335719	
12	50-54	2317232	1940648	4257880	
13	55-59	1746903	1521747	3268650	
14	60-64	1406401	1339053	2745454	
15	65-69	991280	991713	1982993	
16	70-74	686881	703726	1390607	
17	75-79	360216	379551	739767	
18	80+	406536	477025	445803	
19	Total	46745275	44418389	90725906	
20					
21					

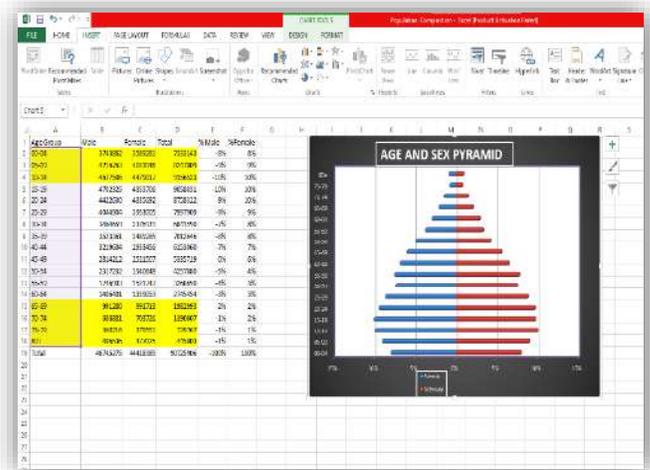
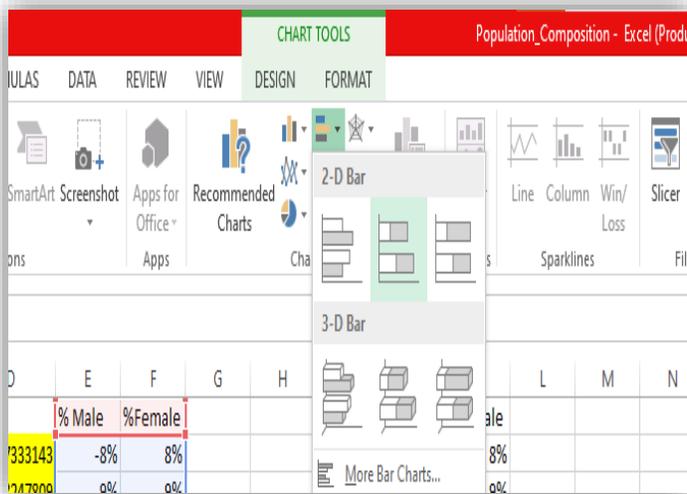
2. Calculate the % of the male and female population from the data

	%male	%female
	-8%	8%
	-9%	9%
	-10%	10%
	-10%	10%
	-9%	10%
	-9%	9%
	-7%	8%
	-8%	8%
	-7%	7%
	-6%	6%
	-5%	4%
	-4%	3%
	-3%	3%
	-2%	2%
	-1%	2%
	-1%	1%
	-1%	1%
	-100%	100%

3. After Calculating the % of the male and female population from the data select the age group with both male and female % population

Age Group	Male	Female	Total	% Male	%Female	%male	%female
00-04	3743862	3589281	7333143	-8%	8%	-8%	8%
05-09	4216763	4031046	8247809	-9%	9%	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%	-10%	10%
20-24	4422630	4335692	8758322	-9%	10%	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%	-9%	9%
30-34	3464659	3376931	6841590	-7%	8%	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%	-8%	8%
40-44	3219604	2933456	6153060	-7%	7%	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%	-5%	4%
55-59	1746903	1521747	3268650	-4%	3%	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%	-3%	3%
65-69	991280	991713	1982993	-2%	2%	-2%	2%
70-74	686881	703726	1390607	-1%	2%	-1%	2%
75-79	360216	379551	739767	-1%	1%	-1%	1%
80+	406536	477025	445803	-1%	1%	-1%	1%
Total	46745275	44418389	90725906	-100%	100%	-100%	100%

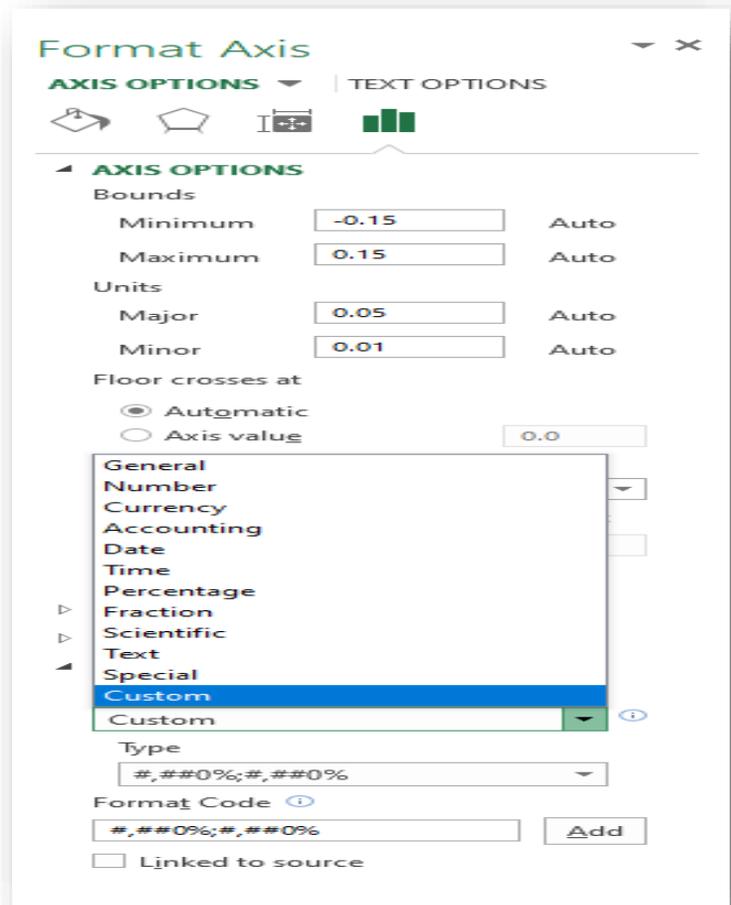
4. Go to insert select a suitable bar



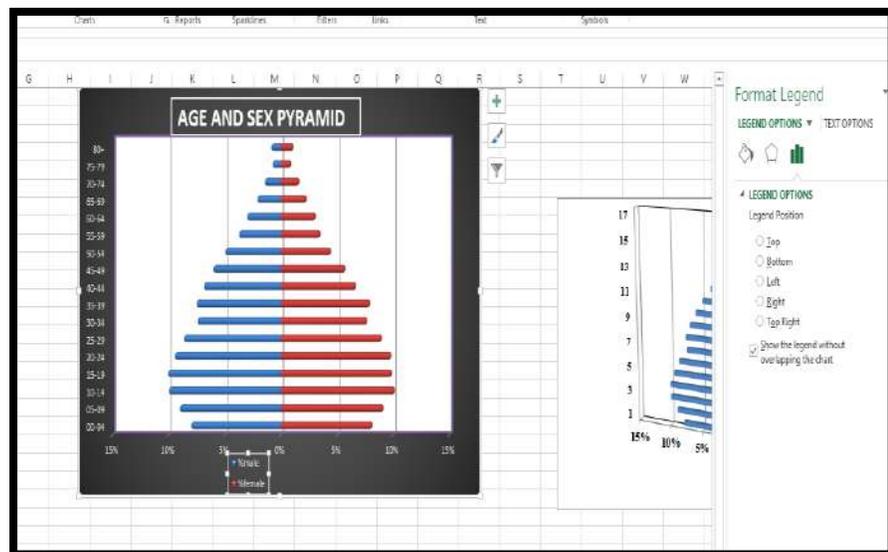
- after your age and sex pyramid was appear you have to remove the (-) portion from the horizontal plane>right click on it > format axis



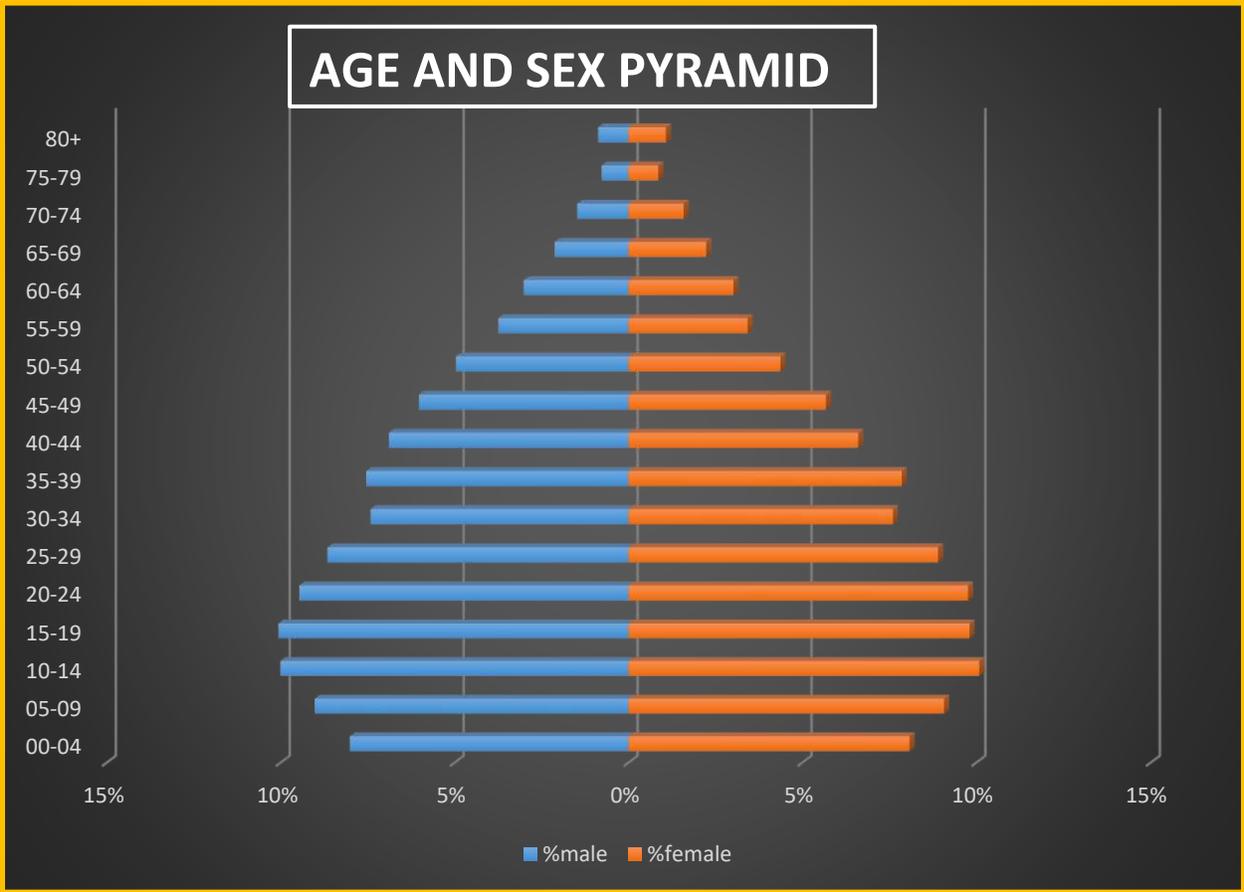
6. than this type of tool box was open > go to number> click on customs



7. Add title , legend etc. by using format legend tool bar



AGE AND SEX PRYRAMID





DEPENDENCY RATIO

1. insert the table on a excel sheet

	A	B	C	D
1	Age Group	Male	Female	Total
2	00-04	3,743,862	3,589,281	7333143
3	05-09	4,216,763	4,031,046	8247809
4	10-14	4,677,506	4,479,017	9156523
5	15-19	4,702,325	4,355,706	9058031
6	20-24	4,422,630	4,335,692	8758322
7	25-29	4,044,904	3,953,005	7997909
8	30-34	3,464,659	3,376,931	6841590
9	35-39	3,523,361	3,489,285	7012646
10	40-44	3,219,604	2,933,456	6153060
11	45-49	2,814,212	2,521,507	5335719
12	50-54	2,317,232	1,940,648	4257880
13	55-59	1,746,903	1,521,747	3268650
14	60-64	1,406,401	1,339,053	2745454
15	65-69	991,280	991,713	1982993
16	70-74	686,881	703,726	1390607
17	75-79	360,216	379,551	739767
18	80+	406,536	477,025	445803
19	Total	46,745,275	44,418,389	90725906

2. make the sum of 1st three total population > than last three > after than make sum of the rest of data

	A	B	C	D	E	F	G	H
1	Age Group	Male	Female	Total				
2	00-04	3,743,862	3,589,281	7333143				
3	05-09	4,216,763	4,031,046	8247809	=SUM(D2:D4)			
4	10-14	4,677,506	4,479,017	9156523	SUM(number1, [number2], ...)			
5	15-19	4,702,325	4,355,706	9058031		40.26986		
6	20-24	4,422,630	4,335,692	8758322				
7	25-29	4,044,904	3,953,005	7997909				

	A	B	C	D	E	F
1	Age Group	Male	Female	Total		
2	00-04	3,743,862	3,589,281	7333143		
3	05-09	4,216,763	4,031,046	8247809	24737475	
4	10-14	4,677,506	4,479,017	9156523		
5	15-19	4,702,325	4,355,706	9058031		40.26986
6	20-24	4,422,630	4,335,692	8758322		
7	25-29	4,044,904	3,953,005	7997909		
8	30-34	3,464,659	3,376,931	6841590		
9	35-39	3,523,361	3,489,285	7012646	=SUM(D5:D14)	
10	40-44	3,219,604	2,933,456	6153060	SUM(number1, [number2], ...)	
11	45-49	2,814,212	2,521,507	5335719		
12	50-54	2,317,232	1,940,648	4257880		
13	55-59	1,746,903	1,521,747	3268650		
14	60-64	1,406,401	1,339,053	2745454		

60-64	1,406,401	1,339,053	2745454		
65-69	991,280	991,713	1982993		
70-74	686,881	703,726	1390607		7.421821
75-79	360,216	379,551	739767	=SUM(D15:D18)	
80+	406,536	477,025	445803	SUM(number1, [number2], ...)	
Total	46,745,275	44,418,389	90725906		

- Put the dependency ratio on excel sheet as mention in the screen shorts.

Age Group	Male	Female	Total		
00-04	3,743,862	3,589,281	7333143		
05-09	4,216,763	4,031,046	8247809	24737475	
10-14	4,677,506	4,479,017	9156523		
15-19	4,702,325	4,355,706	9058031		$=(E3/E9)*100$
20-24	4,422,630	4,335,692	8758322		
25-29	4,044,904	3,953,005	7997909		
30-34	3,464,659	3,376,931	6841590		
35-39	3,523,361	3,489,285	7012646	61429261	
40-44	3,219,604	2,933,456	6153060		
45-49	2,814,212	2,521,507	5335719		
50-54	2,317,232	1,940,648	4257880		47.69168
55-59	1,746,903	1,521,747	3268650		
60-64	1,406,401	1,339,053	2745454		
65-69	991,280	991,713	1982993		
70-74	686,881	703,726	1390607		7.421821
75-79	360,216	379,551	739767	4559170	
80+	406,536	477,025	445803		
Total	46,745,275	44,418,389	90725906		

Age Group	Male	Female	Total		
00-04	3,743,862	3,589,281	7333143		
05-09	4,216,763	4,031,046	8247809	24737475	
10-14	4,677,506	4,479,017	9156523		
15-19	4,702,325	4,355,706	9058031		40.26386
20-24	4,422,630	4,335,692	8758322		
25-29	4,044,904	3,953,005	7997909		
30-34	3,464,659	3,376,931	6841590		
35-39	3,523,361	3,489,285	7012646	61429261	
40-44	3,219,604	2,933,456	6153060		
45-49	2,814,212	2,521,507	5335719		
50-54	2,317,232	1,940,648	4257880		$=(F5+F16)$
55-59	1,746,903	1,521,747	3268650		
60-64	1,406,401	1,339,053	2745454		
65-69	991,280	991,713	1982993		
70-74	686,881	703,726	1390607		1347.378
75-79	360,216	379,551	739767	4559170	
80+	406,536	477,025	445803		
Total	46,745,275	44,418,389	90725906		

Age Group	Male	Female	Total		
00-04	3,743,862	3,589,281	7333143		
05-09	4,216,763	4,031,046	8247809	24737475	
10-14	4,677,506	4,479,017	9156523		
15-19	4,702,325	4,355,706	9058031		40.26386
20-24	4,422,630	4,335,692	8758322		
25-29	4,044,904	3,953,005	7997909		
30-34	3,464,659	3,376,931	6841590		
35-39	3,523,361	3,489,285	7012646	61429261	$=(E11+E17)/E9*100$
40-44	3,219,604	2,933,456	6153060		
45-49	2,814,212	2,521,507	5335719		
50-54	2,317,232	1,940,648	4257880		47.69168
55-59	1,746,903	1,521,747	3268650		
60-64	1,406,401	1,339,053	2745454		
65-69	991,280	991,713	1982993		
70-74	686,881	703,726	1390607		7.421821
75-79	360,216	379,551	739767	4559170	
80+	406,536	477,025	445803		
Total	46,745,275	44,418,389	90725906		

MEASUREMENT MIGRATION

DEFINITION AND CONCEPTS

Migration: Migration can be defined as the change of the place of usual residence for a conventional minimum duration (6 months or 12 months depending the country);

Internal migration: Internal migration is a migration that takes place within the borders of a country or territory;

External or international migration: migration is international when it refers to changes in habitual residence between countries;

"Lifetime" migration: The "lifetime" migration is defined by relating the place of birth and the place of residence to a reference date. The migrant "life-time" is any individual who resides in an administrative entity other than his or her place of birth.

Types of Migration

According to the reasons: Work migration, familial regrouping, School migration, forced Migration, Refugees ;

Depending on the location: Internal, Internationale ;

Depending on the location: Seasonal migration, Circular migration, temporary migration, definitive Migration;

Other typologies: Migration lifetime, old migration, recent migration.

MIGRATION MEASUREMENT

Cross sectional measures: migration rates

Let M be the number of migrations (inputs and outputs) observed in a population over a period of n years in a region i.

• Let P₀ et P_n be the population at beginning and end of period.

• The gross migration m is given

$$m = \frac{M}{\frac{n}{2}(P_0 + P_n)} \quad k$$

By k =100, 1000 ou 10000

• In the same way, the gross emigration rate (or exit index) of an area i is calculated:

$$m_{ia} = \frac{M^a}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

• In the same way, one calculates the gross rate of immigration (or index of entry) of a zone i :

$$m_{ai} = \frac{M^{ai}}{\frac{n}{2}(P_i^0 + P_i^n)} k$$

Longitudinal measures: mobility quotient

• The net rate of migration = $m_{ai} - m_{ia} = \frac{M^{ai} - M^a}{\frac{n}{2}(P_i^0 + P_i^n)} k$

• A positive net rate > attractive region

• A negative net rate > répulsive region

The quotients measure the risk of migrating

• **Emigration quotient** $e_x = \frac{E_x}{S_x + \frac{I_x}{2} - \frac{D_x}{2}}$

ex = quotient of emigration at the exact age x

Sx = survivor at exact age x

Ex = emigration at the end o age x

Ix = Immigration at the correct age x

Dx = Deaths at full age x

STAKEHOLDER ANALYSIS

A **stakeholder analysis** is a process of identifying these people before the project begins; grouping them according to their levels of participation, interest, and influence in the project; and determining how best to involve and communicate each of these stakeholder groups throughout.

PURPOSE OF STAKEHOLDER ANALYSIS

Project managers, program managers, and product managers alike may conduct a stakeholder analysis for several strategic reasons, including:

1. To enlist the help of key organizational players.

By approaching company influencers, executives, or valuable stakeholders for help early in your project, you can leverage the knowledge and wisdom of these key players to help guide the project to a successful outcome. Enlisting these players early on will also increase the chances you will earn their support for your project.

But before you can determine which influencers and other key stakeholders to approach, you'll need to conduct a stakeholder analysis.

2. To gain early alignment among all stakeholders on goals and plans.

Because your stakeholder analysis will help you determine which people to involve in the project, you will then be able to bring these people together for a kickoff and early-stage meetings to communicate the project's strategic objectives and plans.

[Over a third of product managers in 2021, wish they had a clearer purpose and company strategy.](#) A stakeholder analysis will help ensure everyone starts the project with a clear understanding of what success will look like and how they can contribute to that successful outcome.

3. To help address conflicts or issues early on.

Without a stakeholder analysis, you and your team could be well into a company project before you realize a key person in your organization—perhaps an executive—does not see the value of your initiative, or would prefer to redeploy some of your resources to other projects. Such a person might actively work to thwart or derail your project.

If you had conducted a stakeholder analysis before you began, you would have likely identified this executive as potentially important to your project's success. You could have then presented your plan to the executive, listened to their objections, and worked to earn their approval to proceed.

Watch this video for an in-depth explanation of stakeholder analysis and to learn how to efficiently conduct a stakeholder analysis.

IMPORTANCE OF CONDUCTING STAKEHOLDER ANALYSIS

Conducting a stakeholder analysis can be strategically valuable when kicking off any type of complex company undertaking. The more stakeholders you can identify early on and the more you can tailor your communication to win approval and support from various stakeholders, the more likely your project is to succeed.

But if you consider how much of an organization is either involved in or affected by the development of a product—engineering, design, procurement, sales, marketing, product, finance, accounting, customer success, etc.—you can understand why stakeholder analysis is an essential exercise for a product manager.

After all, the way you manage the many stakeholders across your company whose jobs your product could impact—starting with identifying them through a stakeholder analysis—could mean the difference between these stakeholders enthusiastically helping your product's development or trying to block its progress.

STEPS OF CONDUCTING STAKEHOLDER ANALYSIS

Stakeholder analysis exercises will vary by company, industry, and the teams conducting them (e.g., project management vs. product management). But there are useful steps common to most of these types of analyses. Here's how many organizations conduct a stakeholder analysis.

Step 1: Determine who your stakeholders are.

Start by brainstorming with your team a list of all possible stakeholders for your project. Of course, you can reduce this list later, but you don't want to miss a potentially pivotal stakeholder at this early stage.

The list of potential stakeholders could include:

- Executive staff
- Marketing

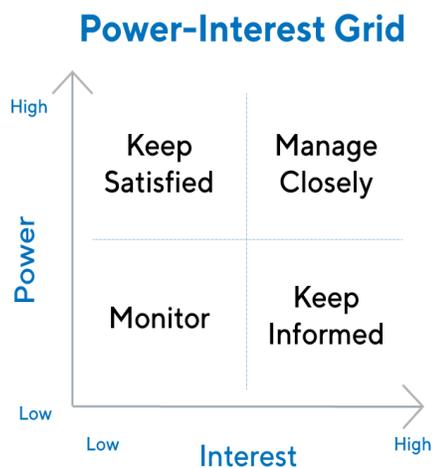
- Sales
- Finance
- Product
- Development/engineering/manufacturing
- Procurement
- The heads of all affected business units
- Consultants
- Operations/IT

Step 2: Group and prioritize these stakeholders.

After you've completed your brainstorming session above and determined which people and teams will indeed be stakeholders, you should start categorizing them in terms of their influence, interest, and levels of participation in your project.

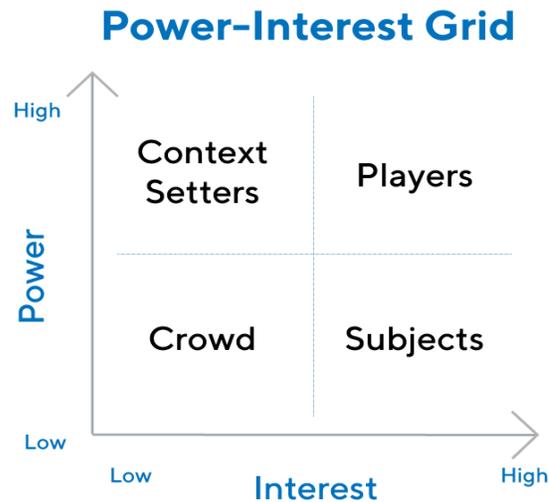
One example of how to do this is by using the [power/interest grid](#).

As you can see, you will group stakeholders into four categories:



1. **High power, high interest:** These are your most important stakeholders, and you should [prioritize](#) keeping them happy with your project's progress.
2. **High power, low interest:** Because of their influence in the company, you should work to keep these people satisfied. But because they haven't shown a deep interest in your project, you could turn them off if you over-communicate with them.
3. **Low power, high interest:** You'll want to keep these people informed and check in with them regularly to make sure they are not experiencing problems on the project.
4. **Low power, low interest:** Just keep these people informed periodically, but don't overdo it.

Another approach, popularized in the book [Making Strategy: Mapping Out Strategic Success](#), groups stakeholders into four different but similar categories.



1. **Players:** These are the high-power, high-interest individuals with whom you will want to collaborate and keep fully engaged.
2. **Subjects:** These are the low-power, high-interest stakeholders who can offer great insights and ideas for the project but whom you don't need to always say yes to.
3. **Context-setters:** These high-power, low-interest stakeholders (heads of departments, for example) can have a lot of influence over the project but don't want to be involved in the details. Keep them up to date.
4. **Crowd:** Finally, the low-power, low-interest stakeholders are called the crowd. These individuals will require some ongoing communication about the project's progress but probably the least of all stakeholders.

Step 3: Figure out how to communicate with and win buy-in from each type of stakeholder.

Once you've built your list detailing which stakeholders fall into which category, it's time to think strategically about how best to earn the ongoing support of each of these stakeholder types. First, you will want to ask yourself questions about your stakeholders such as:

- What motivates this stakeholder?
- What other priorities do they have, and how can we align our project with those priorities (or at least ensure the project won't threaten them)?
- Will this stakeholder likely have a positive view of our project? If not, what can we do about it?

After you've built out these profiles of each stakeholder type, you're ready to begin the next phase of the stakeholder management process—developing your stakeholder communication plan.

SWOT ANALYSIS

SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a [company's competitive position](#) and to develop strategic planning. SWOT analysis assesses internal and external factors, as well as current and future potential.

A SWOT analysis is designed to facilitate a realistic, fact-based, data-driven look at the strengths and weaknesses of an organization, initiatives, or within its industry. The organization needs to keep the analysis accurate by avoiding pre-conceived beliefs or gray areas and instead focusing on real-life contexts. Companies should use it as a guide and not necessarily as a prescription.

FEATURES:

- SWOT analysis is a strategic planning technique that provides assessment tools.
- Identifying core strengths, weaknesses, opportunities, and threats leads to fact-based analysis, fresh perspectives, and new ideas.
- SWOT analysis works best when diverse groups or voices within an organization are free to provide realistic data points rather than prescribed messaging.

SWOT Analysis

SWOT analysis is a technique for assessing the performance, competition, risk, and potential of a business, as well as part of a business such as a product line or division, an industry, or other entity.

Using [internal and external data](#), the technique can guide businesses toward strategies more likely to be successful, and away from those in which they have been, or are likely to be, less successful. Independent SWOT analysts, investors, or competitors can also guide them on whether a company, product line, or industry might be strong or weak and why.

Strengths

Strengths describe what an organization excels at and what [separates it from the competition](#): a strong brand, loyal customer base, a strong balance sheet, unique technology, and so on. For example, a hedge fund may have developed a proprietary trading strategy that returns market-beating results. It must then decide how to use those results to attract new investors.

Weaknesses

Weaknesses stop an organization from performing at its optimum level. They are areas where the business needs to improve to remain competitive: a weak brand, higher-than-average turnover, high levels of debt, an inadequate supply chain, or lack of capital.

Opportunities

Opportunities refer to favorable external factors that could give an organization a competitive advantage. For example, if a country cuts tariffs, a car manufacturer can export its cars into a new market, increasing sales and [market share](#).

Threats

Threats refer to factors that have the potential to harm an organization. For example, a drought is a threat to a wheat-producing company, as it may destroy or reduce the crop yield. Other common threats include things like rising costs for materials, increasing competition, tight labor supply, and so on.

SWOT Table

Strengths

1. What is our competitive advantage?
2. What resources do we have?
3. What products are performing well?

Threats

1. What new regulations threaten operations?
2. What do our competitors do well?
3. What consumer trends threaten business?

METHODS

Internal

What occurs within the company serves as a great source of information for the strengths and weaknesses categories of the SWOT analysis. Examples of internal factors include financial and human resources, tangible and intangible (brand name) assets, and operational efficiencies.

Potential questions to list internal factors are:

- (Strength) What are we doing well?
- (Strength) What is our strongest asset?
- (Weakness) What are our detractors?
- (Weakness) What are our lowest-performing product lines?

External

Weaknesses

1. Where can we improve?
2. What products are underperforming?
3. Where are we lacking resources?

Opportunities

1. What technology can we use to improve operations?
2. Can we expand our core operations?
3. What new market segments can we explore?

What happens outside of the company is equally as important to the success of a company as internal factors. External influences, such as monetary policies, market changes, and access to suppliers, are categories to pull from to create a list of opportunities and weaknesses.¹

Potential questions to list external factors are:

- (Opportunity) What trends are evident in the marketplace?
- (Opportunity) What demographics are we not targeting?
- (Threat) How many competitors exist, and what is their market share?
- (Threat) Are there new regulations that potentially could harm our operations or products?

Use a SWOT analysis to identify challenges affecting your business and opportunities that can enhance it. However, note that it is one of many techniques, not a prescription.

SWOT Analysis Example

In 2015, a Value Line SWOT analysis of The Coca-Cola Company noted strengths such as its globally famous brand name, vast distribution network, and opportunities in emerging markets. However, it also noted weaknesses and threats such as foreign currency fluctuations, growing public interest in "healthy" beverages, and competition from healthy beverage providers.²

Its SWOT analysis prompted Value Line to pose some tough questions about Coca-Cola's strategy, but also to note that the company "will probably remain a top-tier beverage provider" that offered conservative investors "a reliable source of income and a bit of capital gains exposure."

Five years later, the Value Line SWOT analysis proved effective as Coca-Cola remains the 6th strongest brand in the world (as it was then). Coca-Cola's shares (traded under ticker symbol KO) have increased in value by over 60% during the five years after the analysis was completed.

To get a better picture of a SWOT analysis, consider the example of a fictitious organic smooth company. To better understand how it competes within the smoothie market and what it can do better, it conducted a SWOT analysis. Through this analysis, it identified that its strengths were good sourcing of ingredients, personalized customer service, and a strong relationship with suppliers. Peering within its operations, it identified a few areas of weakness: little product diversification, high turnover rates, and outdated equipment.

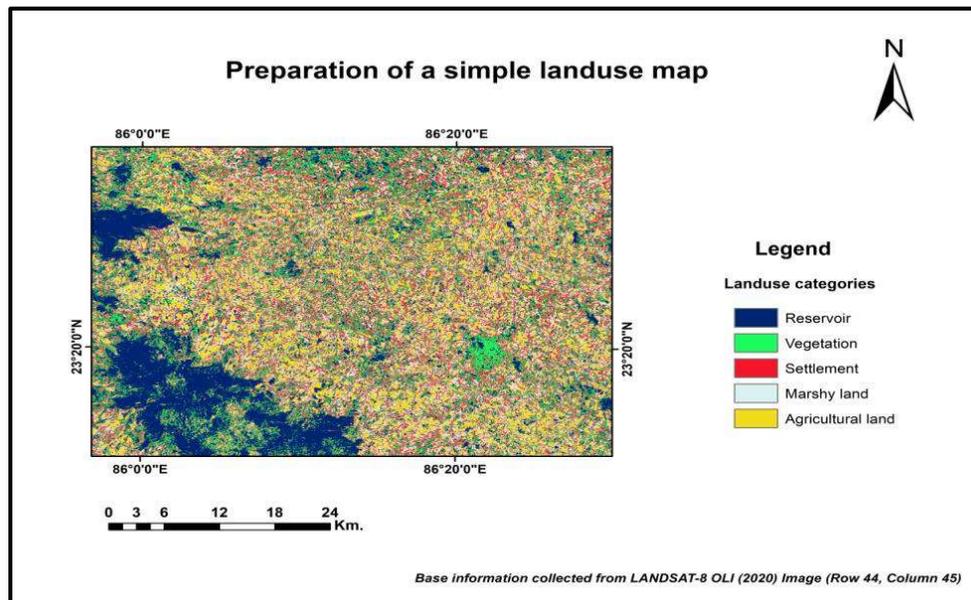
Examining how the external environment affects its business, it identified opportunities in emerging technology, untapped demographics, and a culture shift towards healthy living. It also found threats, such as a winter freeze damaging crops, a global pandemic, and kinks in the supply chain. In conjunction with other planning techniques, the company used the SWOT

analysis to leverage its strengths and external opportunities to eliminate threats and strengthen areas where it is weak.

3.3) APPLICATION OF GIS & RS

Preparation of Land Use Map Using Open Soft Ware:

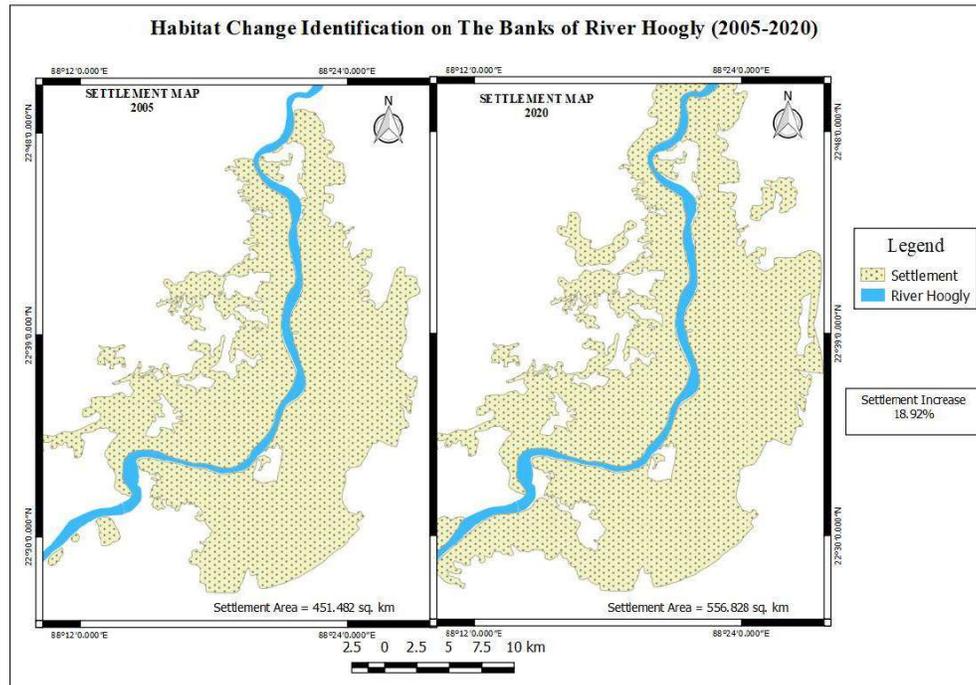
Land Use maps of an area provide information to help users to understand the current landscape. The map, that reflects the land resources and types of land use in the national economy. Land use maps are subdivided into land resource, land in service, and agricultural land use maps.



INTERPRETATION:

Here we have prepared a land use map of Purulia District. A major part of the area is covered by agricultural land (34.44971 sq. km). In this land use map 4.3496 sq. km, 15.3275 sq. km, 20.9375 sq. km, and 24.9356 sq. km area are covered by settlement, reservoir, vegetation and marshy land respectively.

HABITAT CHANGE IDENTIFICATION ON BANKS OF RIVER HOGGLY (1984-2020)



MAPPING OF HUMAN HABITATION & DETECTION OF CHANGE:

INTERPRETATION:

The above map displayed the habitat change on the banks of river Hooghly. Here we have taken 2 satellite maps (year of 2005 and 2020) of the bank of the Hooghly river. The map shows that, the settlement of the mentioned area has increases about 18.92%.

$$\% \text{ Settlement change} = \left[\frac{\text{Area of 2020} - \text{Area of 2005}}{\text{Area of 2005}} \right] * 100$$

THANK YOU

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What is Research: Definition, Methods, Types & Examples

What is Research?

Definition: Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. According to the American sociologist Earl Robert Babbie, “research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.”

Inductive research methods analyse an observed event, while deductive methods verify the observed event. Inductive approaches are associated with qualitative research, and deductive methods are more commonly associated with quantitative analysis.

Characteristics of research

1. Good research follows a systematic approach to capture accurate data. Researchers need to practice ethics and a code of conduct while making observations or drawing conclusions.
2. The analysis is based on logical reasoning and involves both inductive and deductive methods.
3. Real-time data and knowledge is derived from actual observations in natural settings.
4. There is an in-depth analysis of all data collected so that there are no anomalies associated with it.
5. It creates a path for generating new questions. Existing data helps create more research opportunities.
6. It is analytical and uses all the available data so that there is no ambiguity in inference.

What is the purpose of research?

There are three main purposes:

1. **Exploratory:** As the name suggests, researchers conduct exploratory studies to explore a group of questions. The answers and analytics may not offer a conclusion to the perceived problem. It is undertaken to handle new problem areas that haven't been explored before. This exploratory process lays the foundation for more conclusive data collection and analysis.
2. **Descriptive:** It focuses on expanding knowledge on current issues through a process of data collection. Descriptive studies describe the behavior of a sample population. Only one variable is required to conduct the study. The three primary purposes of descriptive studies are describing, explaining, and validating the findings.

3. **Explanatory:** Causal or explanatory research is conducted to understand the impact of specific changes in existing standard procedures. Running experiments is the most popular form.

Types of research methods and example

Research methods are broadly classified as Qualitative and Quantitative.

Both methods have distinctive properties and data collection methods.

Qualitative methods -Qualitative research is a method that collects data using conversational methods, usually open-ended questions. The responses collected are essentially non-numerical. This method helps a researcher understand what participants think and why they think in a particular way.

Types of qualitative methods include:

1. One-to-one Interview
2. Focus Groups
3. Ethnographic studies
4. Text Analysis
5. Case Study

Quantitative methods -Quantitative methods deal with numbers and measurable forms. It uses a systematic way of investigating events or data. It answers questions to justify relationships with measurable variables to either explain, predict, or control a phenomenon.

Types of quantitative methods include:

1. Survey research
2. Descriptive research
3. Correlational research

8 tips for conducting accurate research

1. Identify the main trends and issues, opportunities, and problems you observe. Write a sentence describing each one.
2. Keep track of the frequency with which each of the main findings appears.
3. Make a list of your findings from the most common to the least common.
4. Evaluate a list of the strengths, weaknesses, opportunities, and threats that have been identified in a SWOT analysis.
5. Prepare conclusions and recommendations about your study.
6. Act on your strategies
7. Look for gaps in the information, and consider doing additional inquiry if necessary
8. Plan to review the results and consider efficient methods to analyse and dissect results for interpretation.

Literature search on research problem stated

Literature review-

A **literature review** is an overview of the previously published works on a specific topic. The term can refer to a full scholarly paper or a **section** of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good

literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

Producing a literature review is often a part of graduate and post-graduate student work, including in the preparation of a thesis, dissertation, or a journal article.

Why write a literature review?

When you write a thesis, dissertation, or research paper, you will have to conduct a literature review to situate your research within existing knowledge. The literature review gives you a chance to:

- Demonstrate your familiarity with the topic and scholarly context
- Develop a theoretical framework and methodology for your research
- Position yourself in relation to other researchers and theorists
- Show how your research addresses a gap or contributes to a debate

You might also have to write a literature review as a stand-alone assignment. In this case, the purpose is to evaluate the current state of research and demonstrate your knowledge of scholarly debates around a topic.

The content will look slightly different in each case, but the process of conducting a literature review follows the same steps.

There are five key steps:

1. **Search** for relevant literature
2. **Evaluate** sources
3. **Identify** themes, debates and gaps
4. **Outline** the structure
5. **Write** your literature review

A good literature review doesn't just summarize sources—it analyses, synthesizes, and critically evaluates to give a clear picture of the state of knowledge on the subject.

What is a research gap?

Let us begin with understanding what a research gap means. When you read papers or books on topics of your interest, you may realize there are some areas that have significant scope for more research but they have not been tapped by other researchers. In other words, no one has picked

up or worked on these ideas. A research gap or a literature gap refers to such unexplored or underexplored areas that have scope for further research.

Here are 6 tips to identify research gaps:

1. Look for inspiration in published literature

- Read books and articles on the topics that you like the most. This will not only help you understand the depth of work done by researchers in your field but also provide an opportunity to ask questions that can lead you to a research gap.
- While reading research articles, you can focus on the Introduction section where the authors explain the importance of their research topic and the gaps they have identified and attempted to fill through their research. Also, look at the directions or suggestions for further research that the authors have made as that could be highly inspiring.
- Read meta-analyses and review papers to learn more about the developments and trends in research over the years in the area of your liking. This will help you get acquainted with the problems that have been researched upon in the past as well as trending queries on those topics that you find interesting.

2. Seek help from your research advisor

- Discuss the issues and problems in your field with your research advisor to generate ideas for research. Articulating your ideas and knowing what others think and are working on may help you identify your study area or even identify mistakes in your approach. If you think a question would be interesting to work on, you can discuss it with your advisor and get their suggestions.

3. Use digital tools to seek out popular topics or most cited research papers

- To familiarize yourself with the trending queries in your field, you can use digital tools as they can save time and help you cast a wider net in your search for a research gap. Websites like Essential Science Indicator that identify the most cited papers in a field along with the emerging branches, influential contributors, publications, and countries in that field can be immensely useful to know which topics are considered important. You can also use Google Trends to learn more about the popular questions related to your research area. This will ease your search for an untapped area in your research field.

4. Check the websites of influential journals

- The websites of prominent journals often have a section called ‘key concepts’ where experts in an area highlight the central ideas in that field. Reading through this section can help you gain a lot of insights and generate new ideas as well. Moreover, you should also look through the reference section of these papers as it can lead you to important resources on the topic.

5. Make a note of your queries

- It is a good practice to note all the questions that cross your mind while reading any published literature. If possible, you should map the question to the resource it is based on. "Keep track of what the authors told you and the questions that occur to you whenever you read anything - an article, a book, a book chapter, a dissertation, etc." advises Nadine Anderson, Behavioral Sciences and Women's and Gender Studies Librarian at the University of Michigan. She says that this will also help in ensuring that there is no unintended plagiarism in your research paper. You can use tables, charts, pictures, or tools to maintain a record. This can help you in the long run when you are developing your idea into a research problem or even when writing your manuscript.

6. Research each question

- Once you have a list of questions that could be explored, you must conduct thorough research on them. What does this mean? Read more about each doubt or query that you have. Find out if other researchers have had similar questions and whether they have found answers to them. This will help you avoid duplication of work.

What is Research problem?

A research problem is a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. In some social science disciplines the research problem is typically posed

in the form of a question. A research problem does not state how to do something, offer a vague or broad proposition, or present a value question.

The purpose of a problem statement is to:

Introduce the reader to the importance of the topic being studied. The reader is oriented to the significance of the study and the research questions or hypotheses to follow.

Places the problem into a particular context that defines the parameters of what is to be investigated.

Provides the framework for reporting the results and indicates what is probably necessary to conduct the study and explain how the findings will present this information.

How to identify a research problem?

After choosing a specific topic for your academic paper, you need to state it as a clear research problem that identifies all the issues that you'll address. It's not always simple for students to formulate it. In some fields, they may end up spending a lot of time thinking, exploring, and studying before getting a clear idea of what research questions to answer.

Some research paper topics are too broad to give a researchable issue. For example, if you decide to study certain social issues, like child poverty, remember that they don't provide any researchable question. These are very broad to address and take a lot of time and resources to become unfeasible so that your study will lack enough focus and depth.

After doing this 3 steps, we can do our research.

Framing research questions and hypothesis

Research questions-

research question is 'a question that a research project sets out to answer'. Choosing a research question is an essential element of both quantitative and qualitative research. Good research questions seek to improve knowledge on an important topic, and are usually narrow and specific.

How to frame a hypothesis from research question ?

A hypothesis by definition is a proposition or a number of propositions that reflect a prediction. In simpler words, a hypothesis is a statement that assumes a relationship between an independent variable and a dependent variable. In research, hypotheses provide the basis for data collection and data analysis. The data analysis is essentially applications of research tools and techniques to prove or disprove the hypothesis. However, before testing, it is important to frame the hypotheses properly. This sometimes poses a challenge.

Need for framing a hypothesis from research questions

Not all types of research require a hypothesis. The need for framing a hypothesis stems from the research questions and the research methodology. It depends on the research approach, research type, and research method. Framing a hypothesis is essential in cases:

When the research type was descriptive-

Descriptive research is the one that aims to collect information and analyse it statistically to draw conclusions. For example, let a primary study want to investigate the effects of organizational factors on job satisfaction of employees. Moreover, several organizational factors identified in the literature review are: remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and, scope of promotion. The hypothesis, in this case, will test the effect of these factors on job satisfaction of employees.

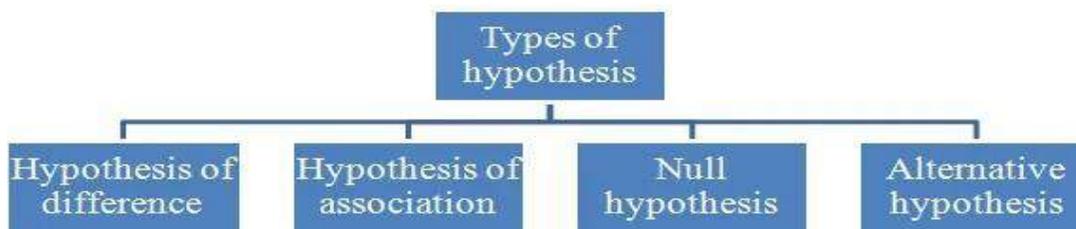
When the research approach is deductive-

A deductive approach of research emphasizes causality and aims to test a theory with the help of a hypothesis. Suppose one wants to examine the Economic theory of export-led growth. This theory states that a country can achieve an accelerated rate of growth by relying on the expansion of exports. There are several factors such as foreign direct investment (FDI), trade openness, exchange rate, bilateral and multilateral trade agreements among others that the literature identifies as related to export expansion. In this case, the hypothesis will be framed to determine the effects of these factors on the growth rate.

When the research method is quantitative-

A quantitative research method is the one that is based on the measurement of variables. It is useful to assess the effect of GDP and the current account deficit of a country on its fiscal deficit. GDP, current account deficit and fiscal deficit all are measured and published in monetary units. The hypothesis, in this case, will be framed to measure the effect of GDP and CAD on the fiscal deficit.

Types of hypothesis -



A hypothesis can be stated in a number of ways. Consider the example research on student performance (grades) in relation to counselling. These are the types of hypotheses that depend on the objective of the study.

- **The hypothesis** of difference. There is a significant difference between the average performance of students who receive counselling and those who do not.
- The hypothesis of association. There are equal numbers of students in the classroom who receive counselling and who do not receive counselling.
- **Null hypothesis.** There is no relationship between counselling and the grades received by students in the classroom.
- **Alternative hypothesis.** There is a significant relationship between counselling and the grades received by students in the classroom.

Furthermore, if the research predicts that there is a significant relationship between counselling and student performance. The alternative hypothesis reflects this prediction. The null hypothesis is framed in such a way that it can be refuted to confirm the alternative hypothesis.

Format of a hypothesis

Consider the example of organizational factors and job satisfaction mentioned above.

- Make a flow chart before framing the hypotheses. This is called a conceptual framework and it helps in framing the hypotheses in a systematic way. In the conceptual framework, list the independent variables or the factors on the left-hand side. The dependent variable 'job satisfaction' should be on the right-hand side. Use an arrow in between. The directionality of the arrow should be from the independent variables to the dependent variable.
- Following the conceptual framework, the independent variables should come on the left-hand side of the hypothesis. The dependent variable should be on the right-hand side of the hypothesis.

- Include words like ‘impact’, ‘influence’, ‘effect’, ‘relationship’ or ‘association’ within the hypothesis. This is to indicate what tests can be used in testing it.
- Use notation H_0 to denote the null hypothesis.
- Use notation H_A to denote the alternative hypothesis.

Following the above rules, the null and the alternative hypotheses in case of the above example are:

H_0 : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have no effect on the job satisfaction of employees.

H_A : Organizational factors given by remuneration, rewards, relation with employers, training, job engagement, workload, healthy environment at work and scope of promotion have a significant effect on the job satisfaction of employees.

Steps for constructing a hypothesis

- The first step before constructing a hypothesis is a thorough review of existing literature on the topic of research.
- After the literature review, identify gaps in the literature. Then narrow down the research problem to fulfill the gap.
- The research problem needs to be stated in terms of research objectives or research questions.
- Following the research question, identify the dependent and the independent variables.
- Frame statements or hypotheses that reflect a prediction and are testable.
- The results of hypothesis testing directly help to answer the research questions and draw conclusions for the study.

Important points

While framing hypotheses, these are the important points one needs to remember.

- The hypothesis should be precise and clear.
- It should be stated in simple terms.

- The hypothesis should propose a relationship between two variables or a set of variables namely dependent and independent variables.
- The scope of the hypothesis should be specific and narrow.
- The hypothesis should conform to the research questions.
- It should be consistent with the findings of the previous researches or facts that are known and established.
- The hypothesis should be testable with primary or secondary data.
- The results of hypothesis testing should address the study's aim and objectives adequately.

Selecting study area and target population

Selecting study area-

Selecting research area is the very first step in writing your dissertation. It is important for you to choose research area that is interesting to you professionally, as well as, personally. Experienced researchers note that “a topic in which you are only vaguely interested at the start is likely to become a topic in which you have no interest and with which you will fail to produce your best work” deally, your research area should relate to your future career path and potentially contribute to the achievement of your career objectives.

The importance of selecting research area that is appropriate for dissertation is often underestimated by many students. This decision cannot be made in haste. Ideally, you should start considering different options at the beginning of the term. However, even when there are only few weeks left before the deadline and you have not chosen a particular topic yet, there is no need to panic.

Target populations-ì

Before research can begin the target population must be identified and agreed upon. The target population is the entire population, or group, that a researcher is interested in researching and analysing. A sampling frame is then drawn from this target population. For example, if the research was to identify approximately how many parents read a particular article in their child's school newsletter, the target population would be all parents of children at that school. The target units would then be the individual parents, and the school could provide a list of parent contact details which would serve as a sampling frame.

Identifying and collecting relevant secondary data

Secondary Data- Secondary data is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.

A researcher may have collected the data for a particular project, then made it available to be used by another researcher. The data may also have been collected for general use with no specific research purpose like in the case of the national census.

Data classified as secondary for particular research may be said to be primary for another research. This is the case when data is being reused, making it primary data for the first research and secondary data for the second research it is being used for.

Steps of collecting secondary data-

1. **Termine your research question** – As indicated above, knowing exactly what you are looking for
2. **Locating data**– Knowing what is out there and whether you can gain access to it. A quick Internet search, possibly with the help of a librarian, will reveal a wealth of options.
3. **Evaluating relevance of the data** – Considering things like the data's original purpose, when it was collected, population, sampling strategy/sample, data collection protocols, operationalization of concepts, questions asked, and form/shape of the data.
4. **Assessing credibility of the data** – Establishing the credentials of the original researchers, searching for full explication of methods including any problems encountered, determining how consistent the data is with data from other sources, and discovering whether the data has been used in any credible published research.
5. **Analysis** – This will generally involve a range of statistical processes as discussed in Chapter 13.

Survey schedule and questionnaire

- The research process is incomplete without the collection of data, which starts after the identification of the research problems and chalking out research design.
- There are several methods involved in the collection of primary data, like observation, interviews, questionnaires, schedules, etc.
- Both questionnaire and schedule are popularly used methods of collecting data in research surveys.
- There is much resemblance in the nature of these two methods and this fact has made many people to remark that from a practical point of view, the two methods can be taken to be the same.
- But from the technical point of view, there are many differences between the two common methods of data collection.

Similarities between survey and questionnaire-

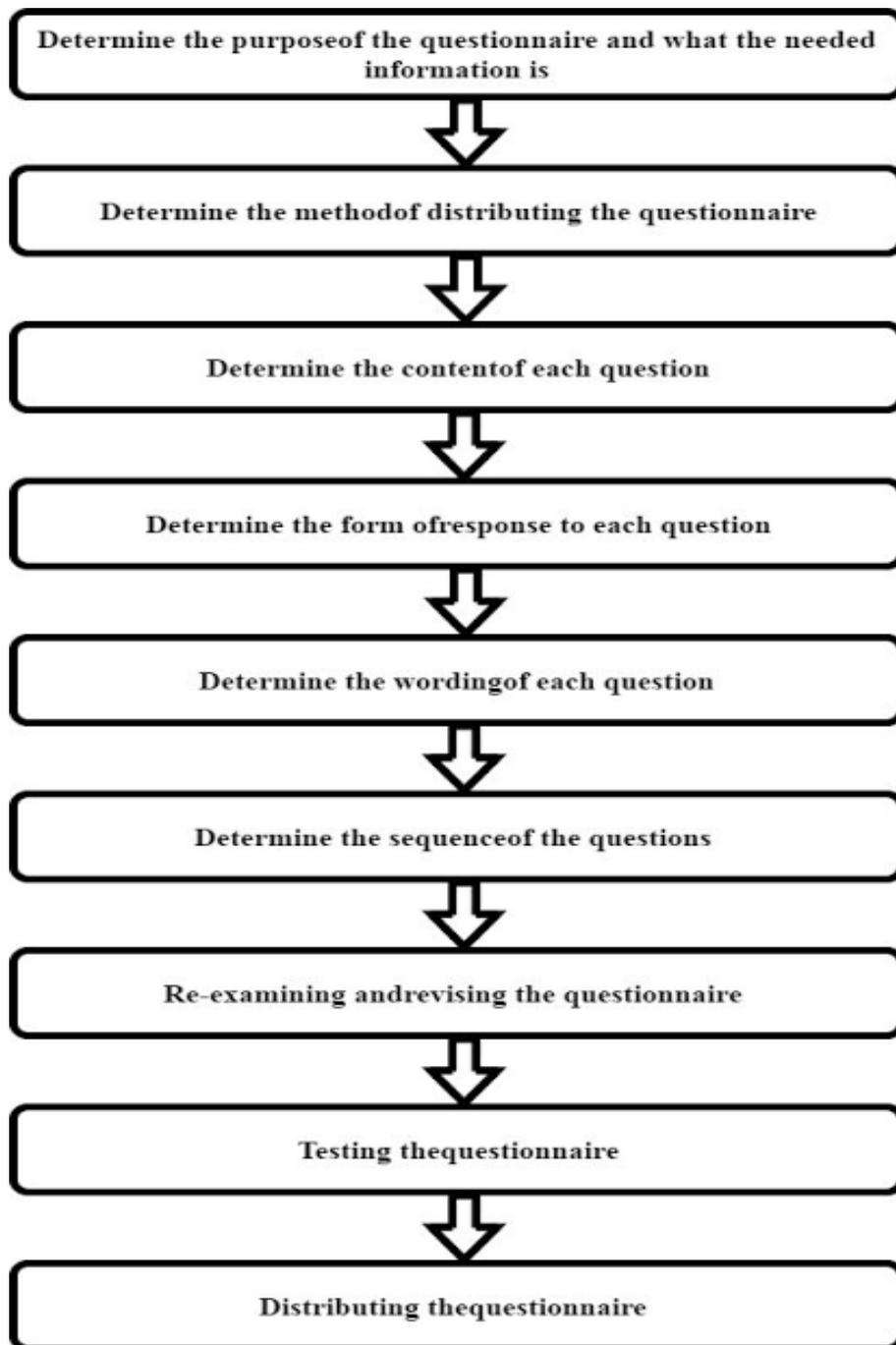
- Both are set of related items having questions relating to a central problem.
- Both use mainly structured questions and these questions are so phased and interlocked that they have a built-in mechanism for testing the reliability and validity of the response.

- In both the same set of questions is administered to all the respondents and comparable results are obtained.
- Both these instruments have to be used with the same general principles of designs and have to take into account the same problems and basic difficulties they have to be limited in length.
- In both, the central problem has to be concentrated upon the following considerations involved in the problem of evolving the questionnaire and a schedule as a unit.
- Drawing the respondent into a situation through awake and interest.
- Proceeding from simple to complex questions.
- No early and sudden request for information of a personal and embracing intimate nature.
- Not asking embarrassing questions without giving the respondent an opportunity to explain himself.
- Moving smoothly from one item to another.
- In both certain types of questions have to be eliminated such as vague and ambiguous questions, emotionally charged questions, loaded and leading questions, questions eliciting no response and questions having a structured response to the queries, violence to the existing facts.
- In both pilot studies and pre-tests are necessary for formulating the instrument and for bringing them to the final form. They have to go through the same stages of development.

Differences between survey schedule and questionnaire -

- The questionnaire refers to a technique of data collection which consists of a series of written questions along with alternative answers.
- The schedule is a formalized set of questions, statements, and spaces for answers, provided to the enumerators who ask questions to the respondents and note down the answers.
- While a questionnaire is filled by the informants themselves, enumerators fill the schedule on behalf of the respondent.

Prepare a schedule-
Prepare a questionnaire-



ISSUES ON FIELD RESEARCH

PILOT STUDY BASED ON QUESTIONNAIRE

Definition: A pilot study is a preliminary small-scale study that researchers conduct in order to help them decide how best to conduct a large-scale research project. Using a pilot study, a researcher can identify or refine a research question, figure out what methods are best for pursuing it, and estimate how much time and resources will be necessary to complete the larger version, among other things.

Process of Piloting a Survey Questionnaire

- **Selecting the pilot sample:** For large or complex surveys, it is a good idea to do a full pilot before starting actual data collection. To do a pilot a researcher need to test all the survey steps from start to finish with a reasonably large sample. The size of the pilot sample depends on how big the actual sample of the researcher is, and how many data collectors the researcher has. For a typical baseline or endline survey a sample of around 30-50 people is usually enough to identify any major bugs in the system.
- **Implementation of all the steps from start to finish:** The researcher will start by training his data collectors, if he has them. Then the researcher will distribute and collect the survey, after which he will enter the completed surveys into the database that he has planned to use and will test the analysis that he has planned to perform.
- **Making improvements:** Assuming that the survey was pretested, piloting will normally identify practical problems with implementation, rather than problems with the survey design. For example, lack of staff training, challenges with the logistics of distributing and collecting the survey, or errors in data entry. These can then be fixed before the researcher do the actual survey.

Advantages of Conducting a Pilot Study:

Pilot studies are useful for a number of reasons, including:

- Identifying or refining a research question or set of questions
- Identifying or refining a hypothesis or set of hypotheses
- Identifying and evaluating a sample population, research field site, or data set
- Testing research instruments like survey questionnaires, interview, discussion guides, or statistical formulas
- Evaluating and deciding upon research methods
- Identifying and resolving as many potential problems or issues as possible
- Estimating the time and costs required for the project
- Gauging whether the research goals and design are realistic
- Producing preliminary results that can help secure funding and other forms of institutional investment

After conducting a pilot study and taking the steps listed above, a researcher will know what to do in order to proceed in a way that will make the study a success.

ETHNOGRAPHIC FIELD DIARY

Ethnographic data is collected in a variety of ways that involve the researcher being embedded in the field in a variety of ways. Ethnographers collect data by observing in the field. This includes both structured and unstructured observations, along with participant observations. In addition, ethnographers engage in formal and informal interviews and focus groups with subjects. Often researchers will engage in a variety of methods for one research project and this data collection will occur over a period of time. An ethnographer may spend days, months or even year in one **field site** to observe an interview research subject. A field site is the location on the environment an ethnographer is studying. It can be virtually any place- a school, workplace, community, home, street and even in the online world. This **triangulation** of ethnographic methods- using a variety of methods in a field site--- help the researcher to gather as much data as possible to identify trend, patterns and nuances of the field they are studying.

As a result of the intensive data collection method that ethnographers engage, researchers often end up with a good deal of data to analyze. It is therefore important for ethnographers to have a plan on exactly they will collect their data before they head into the field.

LONGITUDINAL STUDY

Definition: A longitudinal study is a type of correlational research study that involves looking at variables over an extended period of time. This research can take place over a period of weeks, months, or even years. In some cases, longitudinal studies can last several decades.

Working procedure of Longitudinal Study:

A longitudinal study can be used to discover relationships between variables that are not related to various background variables. This observational research technique involves studying the same group of individuals over an extended period.

Data is first collected at the outset of the study, and may then be repeatedly gathered throughout the length of the study. Doing this allows researchers to observe how variables may change over time.

For example, imagine that a group of researchers is interested in studying how exercise during middle age might impact cognitive health as people age. The researchers hypothesize that people who are more physically fit in their 40s and 50s will be less likely to experience cognitive declines in their 70s and 80s.

The researchers recruit a group of participants who are in their mid-40s to early 50s. They collect data related to how physically fit the participants are, how often they work out, and how well

they do on cognitive performance tests. Periodically over the course of the study, the researchers collect the same types of data from the participants to track activity levels and mental performance.

. Longitudinal studies are usually observational in nature, and are a type of correlational research. Longitudinal research is often contrasted with cross-sectional research. While longitudinal research involves collecting data over an extended period of time, cross-sectional research involves collecting data at a single point in time.

Benefits of Longitudinal Study:

A longitudinal study can provide unique insight that might not be possible any other way. This method allows researchers to look at changes over time. Because of this, longitudinal methods are particularly useful when studying development and lifespan issues. Researchers can look at how certain things may change at different points in life and explore some of the reasons why these developmental shifts take place.¹For example, consider longitudinal studies that looked at how identical twins reared together versus those reared apart differ on a variety of variables. Researchers tracked participants from childhood into adulthood to look at how growing up in a different environment influences things such as personality and achievement. Since the participants share the same genetics, it is assumed that any differences are due to environmental factors. Researchers can then look at what the participants have in common versus where they differ to see which characteristics are more strongly influenced by either genetics or experience

Drawbacks of Longitudinal Study:

- **Longitudinal Studies Can Be Expensive:** Longitudinal studies require enormous amounts of time and are often quite expensive. Because of this, these studies often have only a small group of subjects, which makes it difficult to apply the results to a larger population.
- **Participants Tend to Drop Out Over Time:** Another problem is that participants sometimes drop out of the study, shrinking the sample size and decreasing the amount of data collected. This tendency is known as selective attrition. Participants might drop out for a number of reasons, like moving away from the area, illness, or simply losing the motivation to participate. In some cases, this can influence the results of the longitudinal study. If the final group no longer reflects the original representative sample, attrition can threaten the validity of the experiment. Validity refers to whether or not a test or experiment accurately measures what it claims to measure. If the final group of participants is not a representative sample, it is difficult to generalize the results to the rest of the population.

CASE STUDY RESEARCH

Definition: Case study research is that in which the subject of the research is studied within its social, political, organizational, or economic context and it is one of the commonest approaches across the social and management sciences.

Many authors cite Yin, who describes case study research as:

" ... an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, location no. 638-650).

In other words, the subject of the research is comprehensively studied as an example of a real live phenomenon, within the context in which it happens.

How & when is the Case Study method used?

According to Yin (2006), case study research is best applied when the research addresses descriptive or explanatory questions: i.e. what happened, how, and why?

It is also good for describing a situation or phenomenon occurring in the present, where in-depth description is useful and where the researcher does not need to manipulate events.

Yin (2003) identifies three types of case studies:

1. Exploratory: the case study is used to define questions and hypotheses – or to test out a research procedure – for a further piece of research, such as a large-scale survey.
2. Descriptive: the case study is used to describe a particular phenomenon within its context. It can be used to expand on a particular theme unearthed by a survey.
3. Explanatory: the case study explores cause-effect relationships, and/or how events happen.

Only the third of these approaches can stand up as a method in its own right, and not as an ancillary to other quantitative approaches such as surveys or field experiments.

Advantages of the Case Study as a Research Method

- a) Case studies are "real" – they offer a chance to get a snapshot of real life: a rich and thick picture. As such, they are most appropriate for dealing with a subject that is context dependent, complex, unusual, or where there is some ambiguity.
- b) In direct contrast to positivist approaches, which seek to generalise, the case study offers particularity: i.e. the opportunity for a holistic approach without the distraction of too many variables (Gummesson, 2007).
- c) While it offers depth and specificity, case study research also offers breadth and diversity in terms of methods of data collection and analytical techniques. For example, one case study can incorporate surveys, interviews, direct observation, and archival research. This offers the possibility of several different layers of analysis which can reveal several different perspectives, with the added benefit of triangulation of the results.

- d) According to Woodside (2010, pp. 2-3) the usefulness of case study research lies in the fact that it encourages research methods that help measure thinking over an ongoing period, for example by multiple interviews.
- e) It can also be a useful method when the unit of analysis, or the subject under consideration, is a collective entity such as an organisation or a community.

Disadvantages of the Case Study as a Research Method

- a) The most common objection to case study research is that it is insufficiently rigorous. Quite often this criticism relates not to the method as such, but to the way case studies are presented: the author does not leave a clear audit trail detailing his or her research and explaining the conclusions.
- b) Case studies are often seen as a "bolt-on" to a major research project, defining research questions or throwing further light on an issue that has been revealed by a survey. That explanatory research can offer an understanding of a phenomenon is viewed with scepticism by some, on the grounds that a single case study cannot yield a sufficient volume of evidence on which to generalise.

ETHICAL ISSUES IN COLLECTION OF PRIMARY DATA

In order to act on the data collection, a researcher will most likely have to engage with his student population and other stakeholders. When approaching students with data collection requests it is important to be aware of certain ethical considerations.

Ethical considerations refer to the ethical practices of how data is collected, stored or shared. These can include securing clear and informed consent, how to safely store data or how to secure permissions to use or share data. Here are some common ethical considerations that a researcher needs to think through before collecting his data:

Informed Consent: Informed consent refers to written consent by a person to participate in any given evaluation activity where private data and information may be collected. A document is typically prepared that outlines the goals of the evaluation, why data is being collected from whom and how, how it will be stored, for how long and who will have access to it. Facilitators or data collectors are required to ensure that participants understand this information and provide informed consent.

Confidentiality and Anonymity: Confidential data refers to information that is connected to a particular individual but kept confidential such as medical or service records. Anonymous data is information that cannot be traced to a particular individual. Both kinds of data may prove useful, but it is important to ensure that participants know if and how the information they provide is either confidential or anonymous.

Clear Communication and Data Sharing: While it is important to have clear processes for collecting data, it is equally important to have clear processes for sharing data. This is especially true when individual data is private and sensitive such as mental health or addiction related

information. It is useful to let participants know that any information gathered is aggregated in the analysis process as a way of ensuring privacy of individual data.

PARTICIPATORY RURAL APPRAISAL

Definition

Participatory rural appraisal (PRA) Or participatory learning and action (PLA) is the fieldworkers use of participatory approach. The PRA continues to evolve so fast that no definitions can be final and has to be updated several times. PRA is defined and updated several times by Prof. Robert Chambers. PRA has been described as

and analyse the realities of their lives and condition, and themselves to plan, monitor and evaluate their actions (Chambers, 1994).

empower people to share, analyse and enhance their knowledge of life and conditions, and to plan, act, monitor, evaluate and reflect (Chambers, 2004).

PRA is a flexible, low cost and time saving set of approaches and methods used to enable workers to collect and analyze information in terms of past, present and future situations to understand the rural populace and the condition that exists in rural areas which would provide a thorough and comprehensive idea regarding problems, potentials, resources and solutions to formulate realistic development practitioners to achieve the desired goals within specific time (Chambers 1992). Participatory approaches like PRA are now becoming a basic approach in rural development and a wide range of examples can be found in the literature for natural resources and communally owned land: resource economics (Pretty and Scoones 1989), resource planning (Scoones and McCracken 1989), and community forestry (Molnar 1989 and Messerschmidt 1991). The use of the PRA also brought forth the adaptability of PRA tools and their use in the research process (Szymanski, et.al 1997). Locally, participatory processes create the possibility for creating linkages between survival strategies, knowledge systems, knowledge network and sustainable livelihoods (Gupta, 1997).

The PLA/PRA approach is used with the following assumptions:

1. Rural communities form active foundation for rural development
2. Communities need committed local leaders to stir up their development
3. Communities have knowledge and information but it needs to be organized
4. Communities have resources but they need to be mobilized. They can introduce projects, acting primarily on their own resources.
5. Community organizations are among the many, which are under utilized resources available for development efforts.
6. External units such as Government technical experts and extension workers, NGOs, and international organizations often can provide substantial technical, financial or managerial assistance that is critical to rural communities.

7. Thus, PLA/PRA brings together on the one hand, development needs defined by the community members and on the other, skills of Government, donor agencies and NGOs. It integrates traditional knowledge systems and external technical knowledge in the development process.

PRA helps communities to:

- Mobilize their human and natural resources
- Define problems
- Consider previous successes and failures
- Evaluate priorities and opportunities
- Prepare a systematic and site specific plan of action (CPA)

The objectives of the PRA

The content included in the PRA are simple and do not require high caliber or mathematical thinking. But require minds which are prepared to accept a new way of learning, a new of doing things and that we have limited knowledge of something. The ultimate aim of PLA/PRA workshop is:

1. To build up a permanent “people first” attitudes in the minds of the participants. To show that “people are capable agents to change their own lives” but require limited out side assistance.
2. To establish a notion of “respect” to the people’s knowledge in the life of professionals and their institutions.
3. To provide simple analytical tools to analyze rural situations.
4. To show some of the analytical tools to the community in the field setting and understand their suitability to farmer situation.
5. To enhance participant’s ability to plan with the community.

PRA TECHNIQUES AND METHODS

The most common methods are the following:

Diagramming, Mapping and Modeling: - transects - maps (resource, social, farm)

venn diagrams - seasonally analysis - historical analysis (time lines, trend lines, activity profiles)

Ranking and scoring - pair wise ranking - matrix ranking - matrix scoring - well-being analysis and wealth ranking - proportional piling –

pie charts (injera charts) Problem analysis - identification and specification - causal chaining - prioritization

APPLICATION AND USES OF PRA

The PRA is not purely a new method, but is an adoption and development of various other methods/approaches that were developed before it, such as:

1. **Andragogy of Education**

A well-known expert in education from Brazil, Paulo Freire (1971), gave plenty of critics on the education system that was not participative and did not empower the students. He criticized the conventional education and counseling ways—by referring to it as domestication—as a form of imperialism in the education system. This philosophy of participative education in the system of education and counseling is adopted by the PRA method.

2. **The Field of Research and Science**

According to Robert Chambers (1992) there are five main trends that decorate the principle method of PRA:

a) **Participatory Action Research**, born from the suggestion of Paulo Freire, stating that the poor can and have the possibility to analyze their own facts and conditions. Recognition of the ability of the village community in analyzing their problems is adopted into PRA;

b) **Agro-ecosystem Analysis**, is a combination between system analysis with ownership system by analyzing space, time and the cause-effect relation, relative values and decision making. The methods that were adopted into PRA from this method are the transek technique (locational trace), mapping, seasonal calendar, Venn diagram (inter-party relations) and ranking matrix;

c) **Applied Anthropology**, created as an effect of the critics to the science of pure anthropology that emphasize more on the comprehension of the community. Applied Anthropology is intended to judge the ability and validity of village community knowledge and to differ between the soul-frame of the outsider with the insider. What PRA adopts from applied anthropology is that studying outside in the fields is a flexible art and not a science that is rigid, the difference between emic (community norms) and ethic (scientific norms), the validity of indigenous technical knowledge of the village community;

d) **Field Research on Farming System**, the focus of attention is in field research participation, because the farmers as the main actors in agriculture are very experienced people that have their own ways to maintain the life of their agricultural system. This method contributes to PRA its yard/garden sketching technique;

e) **Rapid Rural Appraisal/PRA**, developed because of a number of reasons. The first being the increase of disappointment against anti-poverty bias as the result of “village development

tourism". The bias referred to are: spatial bias (people only come to visit villages that are still close to the city, the main roads and village center, and ignore the borderline villages); project bias (only provide attention and support for villages that are in a project's area); personnel bias (favors men better than women, the elite than the poor, the service users than the non-users, etc.); seasonal bias (preference to visit the villages during the dry season or during harvest time compared to the wet season or time of famine); diplomatic bias (people from the outside do not wish to meet poor people or see appalling conditions that can touch their hearts). All those biases can combine to conceal the worst poverty of all. The second reason is the disappointment of conventional survey methods. For years and in many places, experience has shown that surveys using questionnaire tend to be over-rated, boring and confusing. The data received are often inaccurate. It also takes a long time to report, is boring and difficult to use, which in the end is often abandoned. The third reason is there has been efforts to find a new and better method that is more effective, by empowering the indigenous technical knowledge of the village community as a source of information to analyze and use for the experts from outside.

FOCUS GROUP DISCUSSION

Definition

A focus group discussion involves **gathering people from similar backgrounds or experiences** together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group.

Key Features of FGDs

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

Skills Required to Conduct FGDs

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.
- Facilitating and conducting a focus group interview requires considerable group process skill. It is important to know how to manage the interview so that one or two people do not

dominate it, and so that those participants who tend not to be highly verbal are able to share their views.

- Training or experience in conducting group discussion. This is very important because an unskilled moderator can unknowingly inhibit the free flow of discussion and draw unjustifiable conclusions and findings.

Pros and Cons of Using FGDs

The advantages of focus group discussion are as follows:

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

POST FIELD TECHNIQUES: METHODS OF REPORT WRITING

The purpose of a field report in the social sciences is to describe the observation of people, places, and/or events and to analyze that observation data in order to identify and categorize common themes in relation to the research problem underpinning the study. The content represents the researcher's interpretation of meaning found in data that has been gathered during one or more observational events.

How to Begin

Field reports are most often assigned in disciplines of the applied social sciences. It is important to build a bridge of relevancy between the theoretical concepts learned in the classroom and the practice of actually doing the work you are being taught to do. Field reports are also common in certain science disciplines but these reports are organized differently and serve a different purpose than what is described below.

Professors will assign a field report with the intention of improving your understanding of key theoretical concepts by applying methods of careful and structured observation of, and reflection about, people, places, or phenomena existing in their natural settings. Field reports facilitate the development of data collection techniques and observation skills and they help you to understand how theory applies to real world situations. Field reports are also an opportunity to obtain evidence through methods of observing professional practice that contribute to or challenge existing theories.

We are all observers of people, their interactions, places, and events; however, your responsibility when writing a field report is to conduct research based on data generated by the act of designing a specific study, deliberate observation, synthesis of key findings, and interpretation of their meaning.

THINGS NEED FOR REPORT WRITING:

- **Systematically observe and accurately record the varying aspects of a situation.** Always approach field study with a detailed protocol about what you will observe, where you should conduct your observations, and the method by which you will collect and record your data.
- **Continuously analyze of observations.** Always look for the meaning underlying the actions you observe. Ask yourself: What's going on here? What does this observed activity mean? What else does this relate to? Note that this is an on-going process of reflection and analysis taking place for the duration of your field research.
- **Keep the report's aims in mind while you are observing.** Recording what you observe should not be done randomly or haphazardly; you must be focused and pay attention to details. Enter the observation site [i.e., "field"] with a clear plan about what you are

intending to observe and record in relation to the research problem while, at the same time, being prepared to adapt to changing circumstances as they may arise.

- **Consciously observe, record, and analyses what you hear and see in the context of a theoretical framework.** This is what separates data gatherings from reporting. The theoretical framework guiding your field research should determine what, when, and how you observe and act as the foundation from which you interpret your findings in relation to the underlying assumptions embedded in the theoretical framework.

Photography

With the advent of smart phones, an almost unlimited number of high quality photographs can be taken of the objects, events, and people observed during a field study. Photographs can help capture an important moment in time as well as document details about the space where your observation takes place. Taking a photograph can save you time in documenting the details of a space that would otherwise require extensive note taking. However, be aware that flash photography could undermine your ability to observe unobtrusively so assess the lighting in your observation space; if it's too dark, you may need to rely on taking notes. Also, you should reject the idea that photographs represent some sort of "window into the world" because this assumption creates the risk of over-interpreting what they show. As with any product of data gathering, you are the sole instrument of interpretation and meaning-making, not the object itself.

Field note:

There are two primary type of field note:

1. Descriptive field note:

It provides in depth descriptions and depiction of particular setting and events as well as objectives, activities, behaviours and interactions make up these contexts.

- Description of participants
- Description of setting or context
- Discussion and dialogue
- Accounts of behaviour and activities
- Observers behaviour

2. Reflective field notes:

It contain reflective commentary are often focused on the role of the research in relation to the setting and participation, providing the opportunity for resource.

- Reflective commentary
- Role or stances of the research in relation to the setting and participation
- Ethical dilemmas
- Methodological challenges and obstacles
- revelations and epiphanies

Video and Audio Recordings

Video or audio recording your observations has the positive effect of giving you an unfiltered record of the observation event. It also facilitates repeated analysis of your observations. This can be particularly helpful as you gather additional information or insights during your research. However, these techniques have the negative effect of

increasing how intrusive you are as an observer and will often not be practical or even allowed under certain circumstances.

Illustrations/Drawings

This does not refer to an artistic endeavor but, rather, refers to the possible need, for example, to draw a map of the observation setting or illustrating objects in relation to people's behavior. This can also take the form of rough tables, charts, or graphs documenting the frequency and type of activities observed. These can be subsequently placed in a more readable format when you write your field report. To save time, draft a table [i.e., columns and rows] on a separate piece of paper before an observation if you know you will be entering data in that way.

Participant observation:

Participatory observation is a central data collection approach within anthropology and other fields such as sociology, psychology, and education; it involves either formal or informal information observation of setting, activities, and events such as meeting, performance,

PRA

PRA is a process which extends into analysis, planning and action. The World Bank defines PRA as a 'family of participatory approaches and methods which emphasize local knowledge and enable local people to do their own appraisal, analysis and planning. 'PRA uses group animation and exercises to facilitate information sharing, analysis and action among stakeholders.

the principles of PRA are: 1) 'handing over the stick' which means surrendering authority to local people in the learning processes, 2) ability to conduct critical examination by and of facilitators of their own roles, personal responsibility i.e. 'using one's own best judgment at all times', 3) multi way sharing of ideas and information and 4) stimulation of 'community awareness'

Focus Group Discussion (FGD)

FGD Campbell (2008) defines a FGD as "a planned, facilitated discussion among a small group of stakeholders designed to obtain perceptions in a defined area of interest in a permissive, non-threatening environment". It is the method of rapid assessment and data gathering in which participants congregate to talk about the specific issues and concern based on a list of key themes drawn up by the researcher/facilitator. The main objective of focus group discussion is to acquire knowledge regarding the particular issue. It can be used to collectively assemble and analyses information for many purposes such as the adoption of a particular innovation, needs assessment (Tipping, 1998), program evaluation. For conducting a focus group discussion, a facilitator and assistant to facilitator are needed. The facilitator leads the group discussion and encourages the participants. The assistant to the facilitator is to take notes, run the tape recorder, respond to the unexpected interruptions, and is always ready to follow the facilitator's mode of action.

Knowledgeable, pleasing personality, politeness, ability to speak local language, respect to local norms and behavior, ethics, patience etc. are the main criteria of a good facilitator.

Specific objectives of the FGD exercise this exercise was meant specifically to: 1) Understand the group's perceptions of climate change by identifying and ranking some of the main climate change problems presently under debate. 2) Identify and understand the major cause or triggers of the identified problems 3) Identify and understand some of the possible mitigation and adaptation strategy to Climate change. All these were meant to in effect expose the individual as well as groups perception of the present climate change issue under debate with the use of a FGD.

STAKEHOLDER ANALYSIS AND IDENTIFICATION OF PROBLEMS AND PRIORITIES

Who are stakeholders?

Stakeholders are persons, groups or institutions with interest in the project or programme. Primary stakeholders are those ultimately affected, either positively (beneficiaries) or negatively. Secondary stakeholders are the intermediaries in the aid delivery process. This definition of stakeholder includes both winners and losers and those involved or excluded from decision making process. Key stakeholders are those, who can significantly influence or are important to the success of the project (ODA, 1995). This wide definition clearly includes ourselves (researchers) and farmers along with other disciplinary categories such as policy makers, extension officers, relevant government & nongovernmental organizations.

The word 'stakeholder' was first recorded in 1708 as 'a person who holds the stake or stakes in a bet' (Ramirez, 2001). In business context, a stakeholder as defined by Freeman (1984) is 'any group or individual who can affect or is affected by the achievement of a corporation's purpose'. However, Röling and Wagemakers (1998), in the context of natural resource management defined stakeholders as 'natural resource users and managers'.

According to ODA (1995) and Allen and Kilvington (2001), there are two types of stakeholders.

i) Primary stakeholders: They are those who are (will be) ultimately affected either positively (e.g., beneficiaries) or negatively (e.g., those involuntarily resettled). They are immediate communities of interest.

ii) Secondary stakeholders: They are the intermediaries in the aid delivery process. They may include government agencies and other institutional bodies. Often these groups do not consider themselves as stakeholders because they feel they own the process.

There is another party called the *Tertiary Stakeholders*. This group consists of those individuals or organizations that do not have any particular ‘stake’ in the initiative. However, their activities affect the project’s functioning and outcome.

What Is Stakeholder Analysis?

A “stakeholder” can be defined as: Any individual, group, or institution who has a vested interest in the natural resources of the project area and/or who potentially will be affected by project activities and have something to gain or lose if conditions change or stay the same.

According to ODA (1995), stakeholder analysis is a tool by which the key stakeholders of a project are identified, their interest in the project is assessed and the ways in which are interest affects project riskiness and viabilities are judged.

Although stakeholder analysis finds its origin to business and managerial science, it is currently used in fields ranging from political science to policy development and international relations (Chevalier, 2001). The concept and related methodology have made significant inroads to poverty reduction studies and applied research pertaining to issues of sustainable livelihood, community based natural resource and conflict management (Ramirez, 1999).

Applications of Stake holder Analysis (SA):

Although SA can be usefully applied to a wide range of policy and management contexts. It is more relevant in complex situations where there are compatibility problems between objectives and stake holders. It is suggested that SA is particularly relevant to natural resource issues where they are characterized by:

- Cross cutting systems and stake holder interests
- Multiple users and users of the resources
- Multiple objectives and concerns
- Temporal trade-offs
- Poverty and under representation
- Market failure

Steps in Stakeholder Analysis:

There are eight major steps in the process:

1. Planning the process: The first step in conducting a stakeholder analysis is to define the purpose of the analysis, identify the potential users of the information, and devise a plan for using the information. A discussion of these issues should be led by the “sponsor,” or initiator, of the stakeholder analysis.

2. Selecting and defining a policy: For a stakeholder analysis to be useful, it must be focused on a specific policy or issue. Again, policy is used in this document to refer to any national, regional, local, or institutional project, program, law, regulation, or rule. In most cases, the

sponsor of the stakeholder analysis will have identified a policy, but it is important to ensure that the policy in question is an appropriate topic for a stakeholder analysis before the process begins.

3. Identifying key stakeholders: Identifying the key stakeholders is extremely important to the success of the analysis. Based on the resources available, the working group should decide on the maximum number of stakeholders to be interviewed.

4. Adapting the tools: Generally, very little secondary information is available on stakeholders. As a result, the working group should plan to interview the priority stakeholders identified to gain accurate information on their positions, interests, and ability to affect the process.

5. Collecting and recording the information: Before beginning the interviews, the working group should gather and review secondary information on the priority stakeholders. It should include any statements regarding the stakeholders' positions on the policy, any goals or objectives of the organizations the stakeholders represent.

6. Filling in the stakeholder table: This step of the process involves taking detailed and often lengthy answers from the interviews and arranging them into a more concise and systematized format.

7. Analyzing the stakeholder table: Once the stakeholder table is complete, the information needs to be "analysed." Such an analysis should focus on comparing information and developing conclusions about the stakeholders' relative importance, knowledge, interests, positions, and possible allies regarding the policy in question.

8. Using the information: Using the information generated by the preceding analysis is an integral part of the stakeholder analysis process.

Benefits/Advantages of stakeholder analysis:

- Identity stakeholders with conflicting interest and provide opportunity for finely adoption of conflict resolution strategies.
- The opinions and views of powerful and influential stakeholders serve as valuable inputs.
- The support and co-ordination of stakeholders are ensured.
- Ensure resource mobilization (both in terms of financial and non-financial).
- Help to identify relations between stakeholders who can be built upon and may enable 'Coalition' of project sponsorship, our-ship and co-operation.
- Identify stakeholders who are sources of risk as threat to the project.
- Identify stakeholders who need empowerment through capacity building or institutional building.

- Help to assess the appropriate type of participation by different stakeholders at successive stage of the project cycle.
- Help to avoid allocation of time and resources to unnecessary individuals or organizations.

Limitations of SA:

1. Though a powerful tool for problem analysis and illuminating the interests of underrepresented, it cannot in itself provide answers to problems.
2. SA, mirrors the groupings and interest of society and in itself does not try to make changes.
3. The process of analysis cannot be extended for examining the role of very large number of stake holders.
4. Cannot be tried to quantify stake holders' likely gains and losses, this is inherently qualitative tool and can best be employed as an illustrative aid to decision making.

SWOT ANALYSIS OF A RURAL DEVELOPMENT SCHEME OR ANY SECTOR

A SWOT analysis makes it possible to assess the various strengths, weaknesses, opportunities and threats (SWOTs) within an organization or within the agricultural extension system as a whole. This factsheet examines the four elements of SWOT and the process of conducting an analysis. It provides tips for conducting the analysis and a ready-to-use SWOT analysis template. The factsheet concludes by looking at scenarios when a SWOT analysis is most appropriate, as well as its advantages and disadvantages.

What is SWOT analysis?

SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats. Occasionally, it may also be found as a 'WOTS up' analysis or the TOWS analysis. The technique is credited to Albert Humphrey who led a research project at Stanford University in the 1960s and 1970s using data from leading companies involved in long range planning processes.

A SWOT analysis is a planning tool used to understand key factors - strengths, weaknesses, opportunities, and threats - involved in a project or in an organization. It involves stating the objective of the organization or project and identifying the internal and external factors that are either supportive or unfavorable to achieving that objective. SWOT is often used

as part of a strategic or planning process, but can be applied to help understand an organization or a situation, and also for decision-making for many different scenarios.

The SWOT framework:

A SWOT analysis process generates information that is helpful in matching an organization or group's goals, programs, and capacities to the environment in which it operates. The 'SWOT' itself is only a data capture exercise - the analysis follows later.

Strengths: positive tangible and intangible attributes, internal to an organization and within the organization's control.

Weaknesses: internal factors within an organization's control that detract from the organization's ability to attain the desired goal. Which areas might the organisation improve?

Opportunities: external attractive factors that represent the reason for an organization to exist and develop. What opportunities exist in the environment, which will propel the organization? Identify them by their 'time frames'.

Threats: external factors beyond the organization's control which could place the organization mission or operation at risk. The organization may benefit by having contingency plans to address them if they should occur. Classify them by their severity and probability of occurrence.

The SWOT process:

Doing a SWOT analysis can be very straight forward, but its strengths lie in its flexibility and experienced application.

- Decide how the information is to be collected and by whom (often a team approach is much more powerful than one person's view).
- Identify appropriate sources of information.
- Gather the information - it's useful to use a template as the basis for exploring the factors and recording the information. See our practical and ready-to-use template below.
- Plot the findings.
- Identify the most important issues.
- Identify strategic options.
- Write a discussion document.
- Disseminate and discuss the findings.
- Decide which activities are a priority in the context of the organisation's goals and values – a possible action plan framework appears below.

The SWOT analysis tips:

Some useful tips for carrying out a SWOT analysis:

1. Collaborate - an analysis that involves multiple perspectives will deliver a better outcome.
2. Use expertise and resources that are already available within the organisation.
3. Use SWOT analysis in conjunction with other techniques, such as PESTLE analysis.

4. Incorporate the analysis into an ongoing process for monitoring changes in the business environment.
5. Try not to get bogged down collecting vast amounts of detailed information without analysing and understanding your findings appropriately.
6. Don't jump to conclusions about the future based on the past or present.

When to use a SWOT analysis:

A SWOT analysis can be used for:

- Workshop sessions.
- Generating ideas and solutions.
- Problem solving.
- Planning.
- Strategic planning (with PESTLE).
- Product evaluation.
- Competitor evaluation (with Porter's five forces).
- Personal development planning.
- Decision making (with Lewin's force field analysis).

For example, using SWOT in a team meeting might include the following steps:

- Invite contributors to participate in the SWOT process.
- Explain the process and establish ground rules.
- Identify strengths.
- Identify weaknesses.
- Identify or list the opportunities and threats – this may well have been identified from a PESTLE analysis previously.
- Establish priorities – from your mission, vision and values work.
- Question each list.

Advantages and Disadvantages of using SWOT analysis:

There are a number of advantages and disadvantages of using the SWOT approach to analysis.

Advantages include:

- ❖ It's a simple four box framework.
- ❖ It facilitates an understanding of the strengths and weaknesses of the organisation.
- ❖ It encourages the development of strategic thinking.
- ❖ It enables senior managers to focus on strengths and build opportunities.
- ❖ It can enable an organisation to anticipate future business threats and take action to avoid or minimise their impact.
- ❖ It can enable an organisation to spot business opportunities and exploit them fully. It's flexible.

Disadvantages include:

- ❖ Some SWOT analysis users oversimplify the amount of data used for decisions – it's easy to use insufficient data.
- ❖ The risk of capturing too much data may lead to 'paralysis by analysis.
- ❖ The data used may be based on assumptions that later prove to be unfounded.
- ❖ Access to quality internal data sources can be time consuming and politically difficult (especially in more complex organisations – parent company, etc).
- ❖ It lacks detailed structure, so key elements may get missed.
- ❖ The pace of change makes it increasingly difficult to anticipate developments that may affect an organisation in the future.
- ❖ To be effective, the process needs to be repeated on a regular basis.

AGE SEX PYRAMID

DEFINITION OF AGE SEX PYRAMID

A population **pyramid** or " **age-sex pyramid** " is a graphical illustration of the distribution of a population (typically that of a country or region of the world) by age groups and sex; it typically forms the shape of a pyramid when the population is growing.

HOW TO CREATE AGE SEX PYRAMID

STEPS –

1 . First add the data on excel sheet

2.calculate the % of the male and female population from the data

Microsoft Excel interface showing a table with columns: Age Group, Male, Female, Total, and % Total. The table data is as follows:

Age Group	Male	Female	Total	% Total
00-04	3743862	3589281	7333143	
05-09	4216763	4031046	8247809	
10-14	4677506	4479017	9156523	
15-19	4702325	4355706	9058031	
20-24	4422630	4335692	8758322	
25-29	4044904	3953005	7997909	
30-34	3464659	3376931	6841590	
35-39	3523361	3489285	7012646	
40-44	3219604	2933456	6153060	
45-49	2814212	2521507	5335719	
50-54	2317232	1940648	4257880	
55-59	1746903	1521747	3268650	
60-64	1406401	1339053	2745454	
65-69	991280	991713	1982993	
70-74	686881	703726	1390607	
75-79	360216	379551	739767	
80+	408536	477025	445803	
Total	46745275	44418389	90725906	

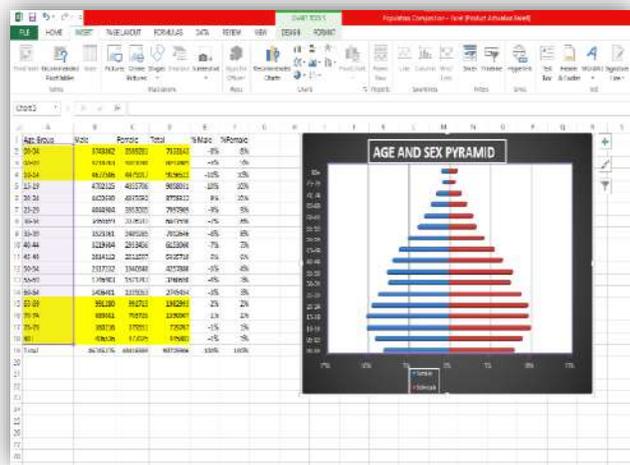
Microsoft Excel interface showing a table with columns: %male and %female. The table data is as follows:

%male	%female
-8%	8%
-9%	9%
-10%	10%
-10%	10%
-9%	10%
-9%	9%
-7%	8%
-8%	8%
-7%	7%
-6%	6%
-5%	4%
-4%	3%
-3%	3%
-2%	2%
-1%	2%
-1%	1%
-1%	1%
-100%	100%

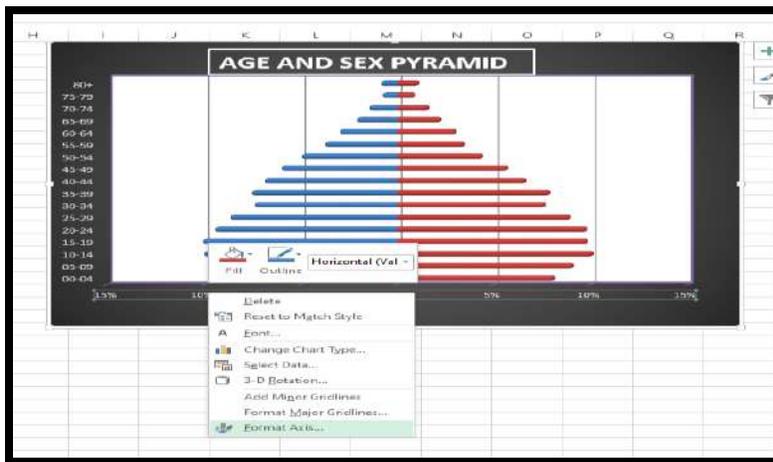
After Calculating the % of the male and female population from the data select the age group with both male and female % population

Age Group	Male	Female	Total	% Male	% Female
00-04	3743862	3585281	7333143	-6%	6%
05-09	4216763	4031046	8247809	-9%	9%
10-14	4677506	4479017	9156523	-10%	10%
15-19	4702325	4355706	9058031	-10%	10%
20-24	4422630	4355692	8758322	-9%	10%
25-29	4044904	3953005	7997909	-9%	9%
30-34	3464859	3376931	6841590	-7%	8%
35-39	3523361	3489285	7012646	-8%	8%
40-44	3219804	293456	6153060	-7%	7%
45-49	2814212	2521507	5335719	-6%	6%
50-54	2317232	1940648	4257880	-5%	4%
55-59	1748903	1521747	3268650	-4%	3%
60-64	1406401	1339053	2745454	-3%	3%
65-69	991280	991713	1982993	-2%	2%
70-74	686881	703726	1390607	-1%	2%
75-79	360216	378551	738767	-1%	1%
80+	406536	477025	445803	-1%	1%
Total	46745275	44418389	90725664	-100%	100%

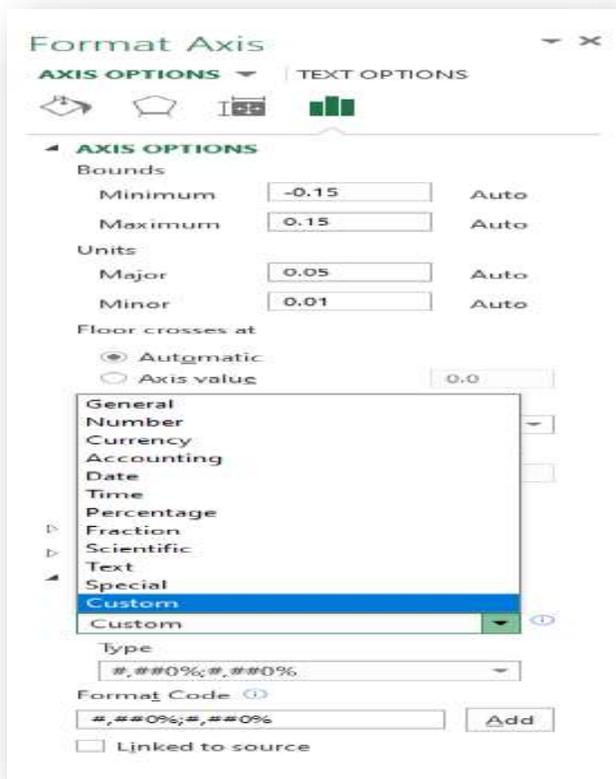
Then go to insert select a suitable bar



1. After your age and sex pyramid was appear then you have to remove [-] Portion from the horizontal plane --- right click on it ----then format axis.

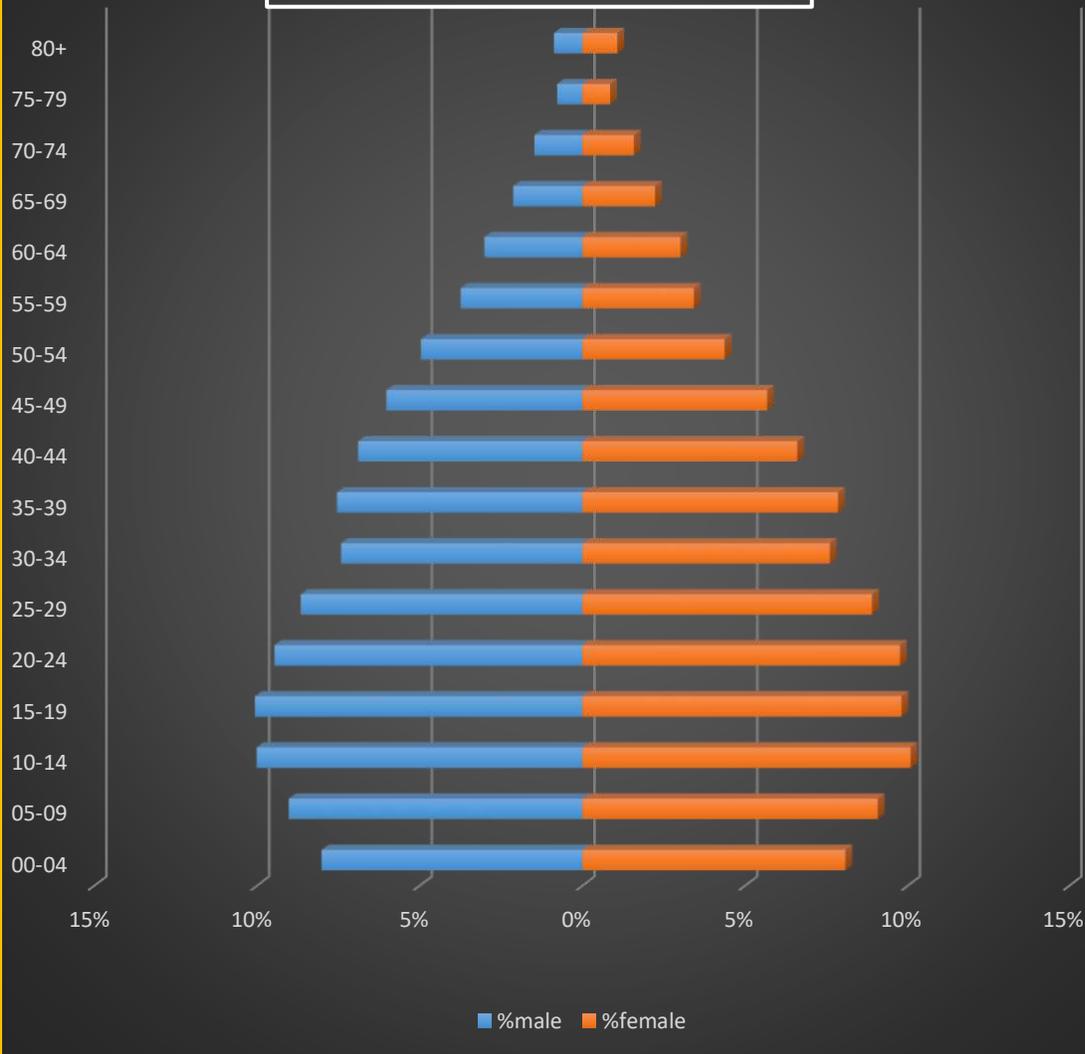


Then this type of tool box was open > go to number> click on customs



1. than this type of tool box was open > go to number> click on customs

AGE AND SEX PYRAMID



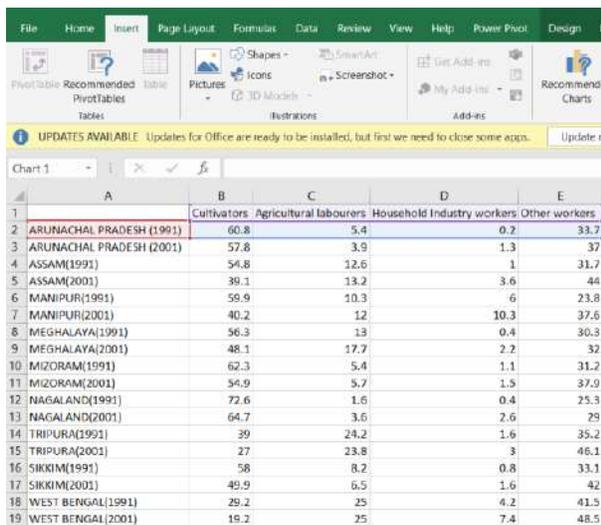
Occupational Structure

What is Occupational Structure?

The occupational structure of any country is defined by the segment of a country's population that is engaged in economic ventures and various professions. To define occupational structure more simply, the different demographic sections of a country who are employed in different sectors like agriculture, manufacturing and transport, among many others constitute the occupational structure of a nation.

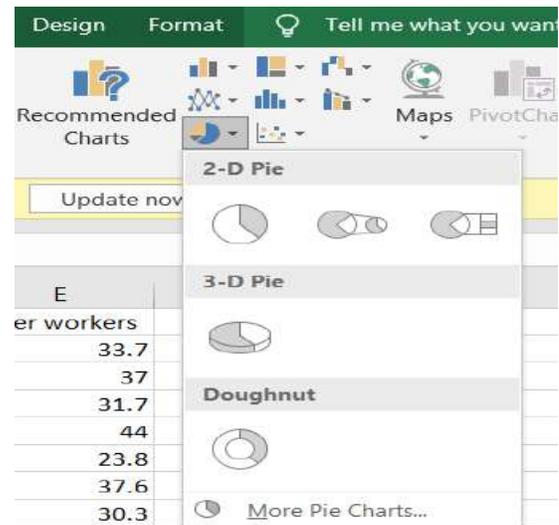
Steps for occupational structure:

1. At first add the data on excel sheet.
2. Now select the data according to your choice → go to Insert → select recommended charts and click 3a-D Pie → ok.



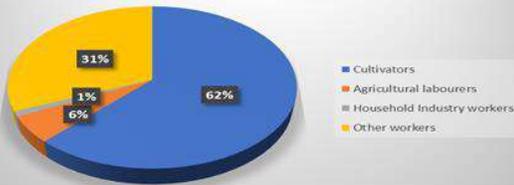
UPDATES AVAILABLE: Updates for Office are ready to be installed, but first we need to close some apps. Update now

	A	B	C	D	E
		Cultivators	Agricultural labourers	Household Industry workers	Other workers
1					
2	ARUNACHAL PRADESH (1991)	60.8	5.4	0.2	33.7
3	ARUNACHAL PRADESH (2001)	57.8	3.9	1.3	37
4	ASSAM(1991)	54.8	12.6	1	31.7
5	ASSAM(2001)	39.1	13.2	3.6	44
6	MANIPUR(1991)	59.9	10.3	6	23.8
7	MANIPUR(2001)	40.2	12	10.3	37.6
8	MEGHALAYA(1991)	56.3	13	0.4	30.3
9	MEGHALAYA(2001)	48.1	17.7	2.2	32
10	MIZORAM(1991)	62.3	5.4	1.1	31.2
11	MIZORAM(2001)	54.9	5.7	1.5	37.0
12	NAGALAND(1991)	72.6	1.6	0.4	25.3
13	NAGALAND(2001)	64.7	3.6	2.6	29
14	TRIPURA(1991)	39	24.2	1.6	35.2
15	TRIPURA(2001)	27	23.8	3	46.1
16	SIKKIM(1991)	58	8.2	0.8	33.1
17	SIKKIM(2001)	49.9	6.5	1.6	42
18	WEST BENGAL(1991)	29.2	25	4.2	41.5
19	WEST BENGAL(2001)	19.2	25	7.4	48.5

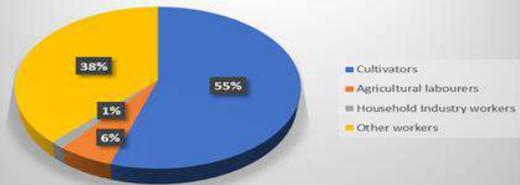


3. After that select the pie diagram → then copy and paste the diagram and merge → save as image → ok.

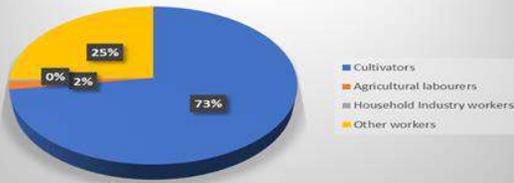
MIZORAM(1991)



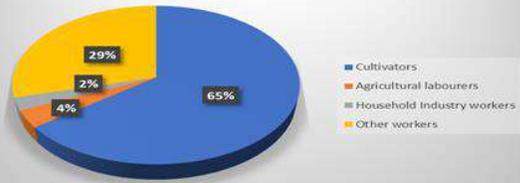
MIZORAM(2001)



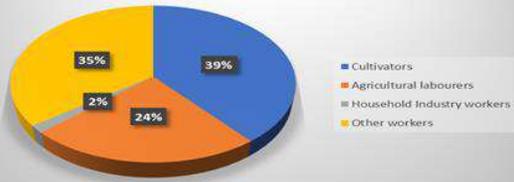
NAGALAND(1991)



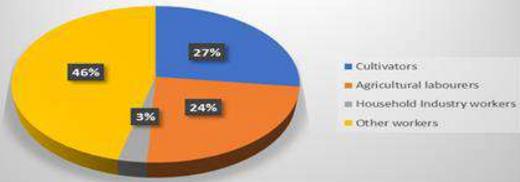
NAGALAND(2001)



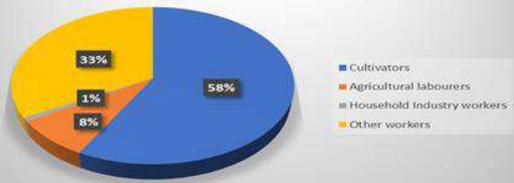
TRIPURA(1991)



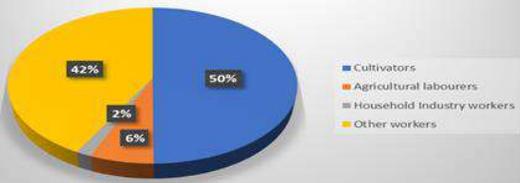
TRIPURA(2001)



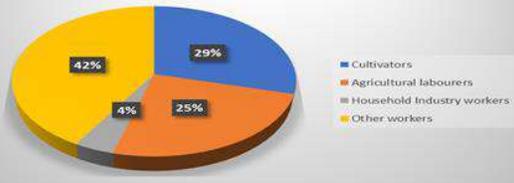
SIKKIM(1991)



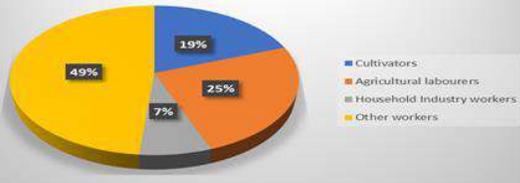
SIKKIM(2001)



WEST BENGAL(1991)



WEST BENGAL(2001)



MIGRATION

MIGRATION DEFINITION

Migration is the progress of people from one place to another, to establish their permanent or semi-permanent residence at the destination. Immigration is an essential component of change, [structure](#), and population growth, as are birth rates and mortality.

There are attraction factors and pushing factors in one place, which influence a person's decision to move. The first are those that attract people to stay, such as low crime rates, pleasant weather, political stability, and excellent employment opportunities. Push factors encourage people to leave the place, such as poverty, war, and floods. [Migration] is usually voluntary, but there are many specific reasons why a person can do it. Sometimes it is forced. Immigration has been a widespread phenomenon throughout the history of humanity; however, nomadic movements are non-migratory, since their purpose is not to settle permanently or semi-permanently in one place. Nor are tourist trips, pilgrimages, and other actions that do not have this end.

Causes

The causes vary, from the pure desire to experience life in another place to the obligation to move to avoid risks found in an area. The roots of [migration] are the following:

Economic Seek employment, start or continue a career, in particular, take advantage of the economic benefits of a specific country, and so on.

Social stay close or live with the family, seek a better quality of lifestyle, and so on.

Policies from persecutions, wars, and other types of problems or political conflicts that put lives at risk.

Cultural improve the quality of [education](#), seek religious affinity or tolerance, taste for the culture of the country, and so on.

Environmental Escape from natural disasters, find a place with a more pleasant climate, and so on.

TYPES OF MIGRATION

1. Internal migration:

Internal migration is a migration that takes place within the borders of a country or territory;

2. External or international migration:

Migration is international when it refers to changes in habitual residence between countries ;

3. "Lifetime" migration:

The "lifetime" migration is defined by relating the place of birth and the place of residence to a reference date. The migrant "life-time" is any individual who resides in an administrative entity other than his or her place of birth.

4. Migrator flows:

Migration flows refer to movements (in and out) of population (nationals and foreigners) that occur at the borders of a given country;

5. Stock of migrants:

Migrant stocks are referred to as the number of migrants (immigrants and emigrants) residing in a country with a certain length of stay, irrespective of the socioeconomic characteristics (migrant workers, refugees, students, etc.) of migrants;

6. Diaspora:

A diaspora is defined both as the dispersion of a people in foreign countries and the formation of a community of that people in those countries;

7. clandestine/irregular migration:

There is "clandestine migration" when a foreigner enters a country without respecting the entry conditions or has entered illegally, remains there beyond the time allowed by law.

LAND USE AND LAND COVER MAPS

The terms land use and land cover are often used interchangeably, but each term has its own unique meaning. Land cover refers to the surface cover on the ground like vegetation, urban infrastructure, water, bare soil etc. Identification of land cover establishes the baseline information for activities like thematic mapping and change detection analysis. Land use refers to the purpose the land serves, for example, recreation, wildlife habitat, or agriculture.

When used together with the phrase Land Use / Land Cover (LULC) generally refers to the categorization or classification of human activities and natural elements on the landscape within a specific time frame based on established scientific and statistical methods of analysis of appropriate source materials. Land cover is the physical material at the surface of the earth. Land use is the description of how people utilize the land for the socio-economic activities.

Reason to use Land use and Land cover maps :-

- LULC maps play a significant and prime role in **planning, management and monitoring programmes** at local, regional and national levels. This type of information, on one hand, provides a better understanding of **land utilization aspects** and on the other hand, it plays an

important role in **the formation of policies and programme required for development planning.**

- For ensuring sustainable development, it is necessary to **monitor the on going process on land use/land cover** pattern over a period of time.
- **In order to achieve sustainable urban development** and to **check the haphazard development** of towns and cities, it is necessary that authorities associated with the urban development generate such planning models so that every bit of available land can be used in most rational and optimal way.
- LULC maps also help us to **study the changes** that are happening in our ecosystem and environment and **we can make policies and launch programmes to save our environment.**

LULC classification:-

LULC classification is one of the most widely used applications in remote sensing. The most commonly used approaches include:

Unsupervised classification, supervised classification, Image segmentation, NDVI

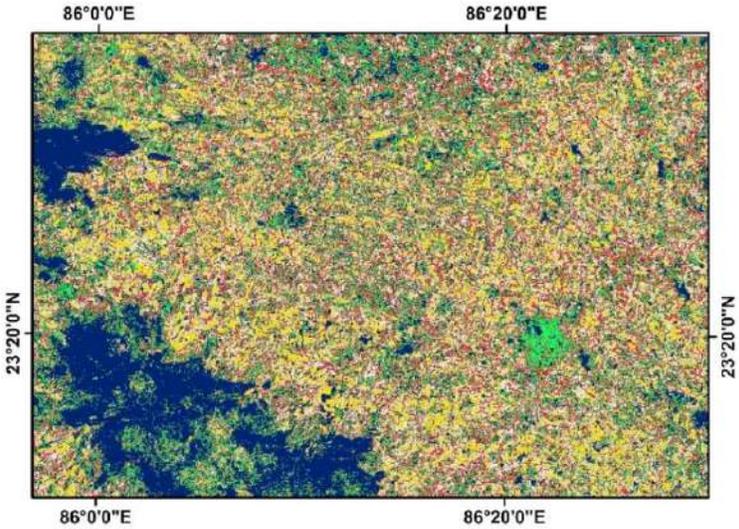
Applications of LULC maps:-

- Natural resource management
- Wildlife habitat protection
- Baseline mapping for GIS input
- Urban expansion / encroachment
- Routing and logistics planning for seismic / exploration/resource extraction activities
- Damage delineation (tornadoes, flooding, volcanic, seismic, fire)
- Legal boundaries for tax and property evaluation. Target detection - identification of landing strips, roads, clearings, bridges, land/water interface.

Steps to create Land use and Land cover Maps :-

Data downloading → Downloading vector data → Downloading ESA Global land cover dataset → Data pre-processing → loading vector data into QGIS → Extracting shape file for chosen area → Adding ESA land cover data to QGIS → clipping ESA Global land cover dataset → Data preparation → Install SCP Plugin in QGIS → QGIS Install Plugin Window → SCP Dock → Import Data → Select Directory SCP Plugin → Creating a Bandset → SCP Bandset Page → SCP Plugin Bandset window with the single band list loaded → Pixel information for each band → Area image before changing band rendering → Create training input → Create classes → Change Band Rendering → Create ROIs → Assess ROIs → Spectral Signature Plot → Run classification → Ground cover classification → SCP land cover change outputs → Layer Properties, Symbology → Land cover change output map

Preparation of a simple landuse map



Legend

Landuse categories

-  Reservoir
-  Vegetation
-  Settlement
-  Marshy land
-  Agricultural land



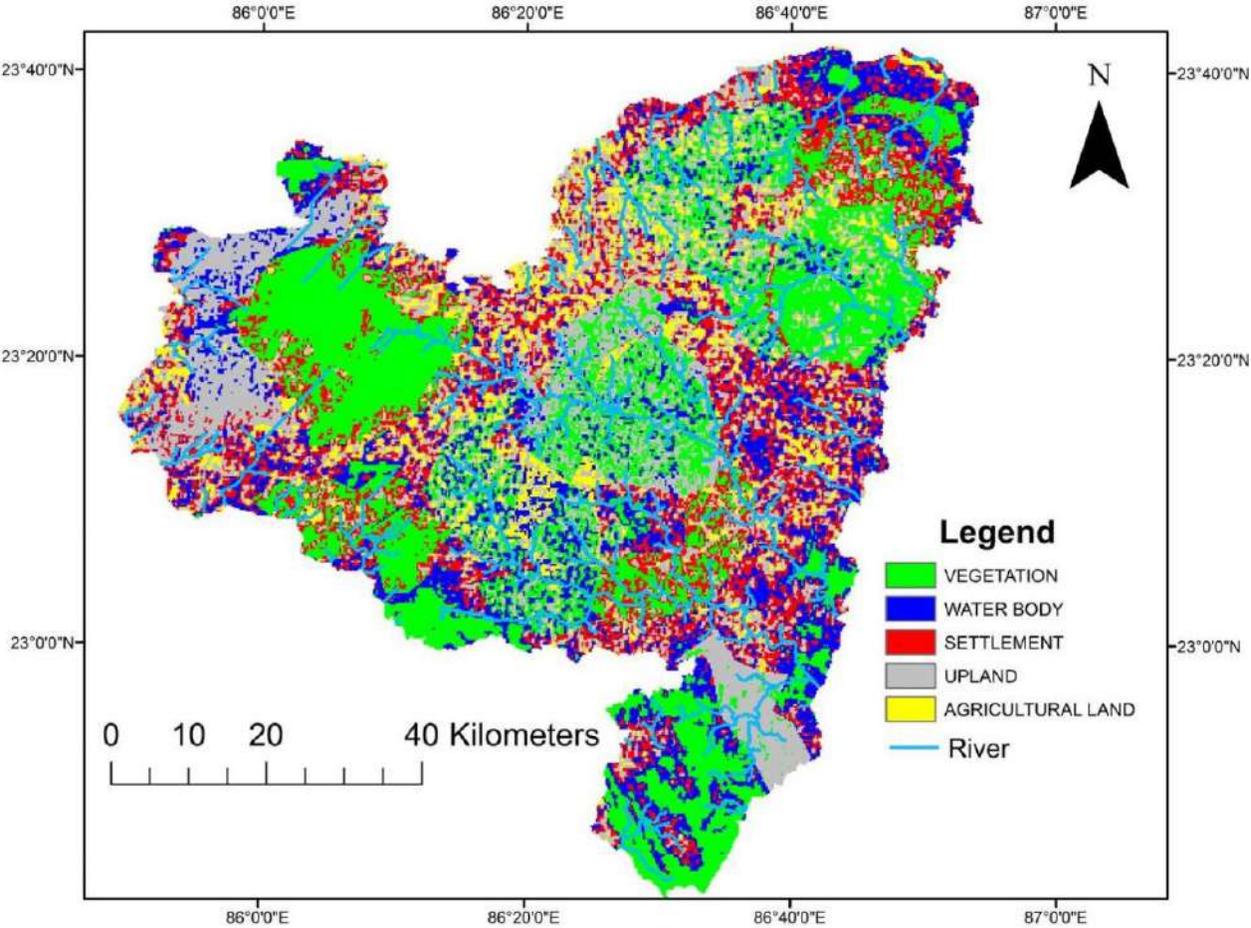
Base information collected from LANDSAT-8 OLI (2020) Image (Row 44, Column 45)

Interpretation

Here in this land use map, there is a reservoir in the north-east side of the area, which is indicated by blue. We can notice, most of this area is covered by agricultural land, which is highlighted by yellow. There are some vegetation in this area which is covered with green. In this area we can see settlement with medium density as red colour. There are marshy land which is noticed very often and this is noticed as grey colour.

We can get a land use and land cover map of Purulia district.

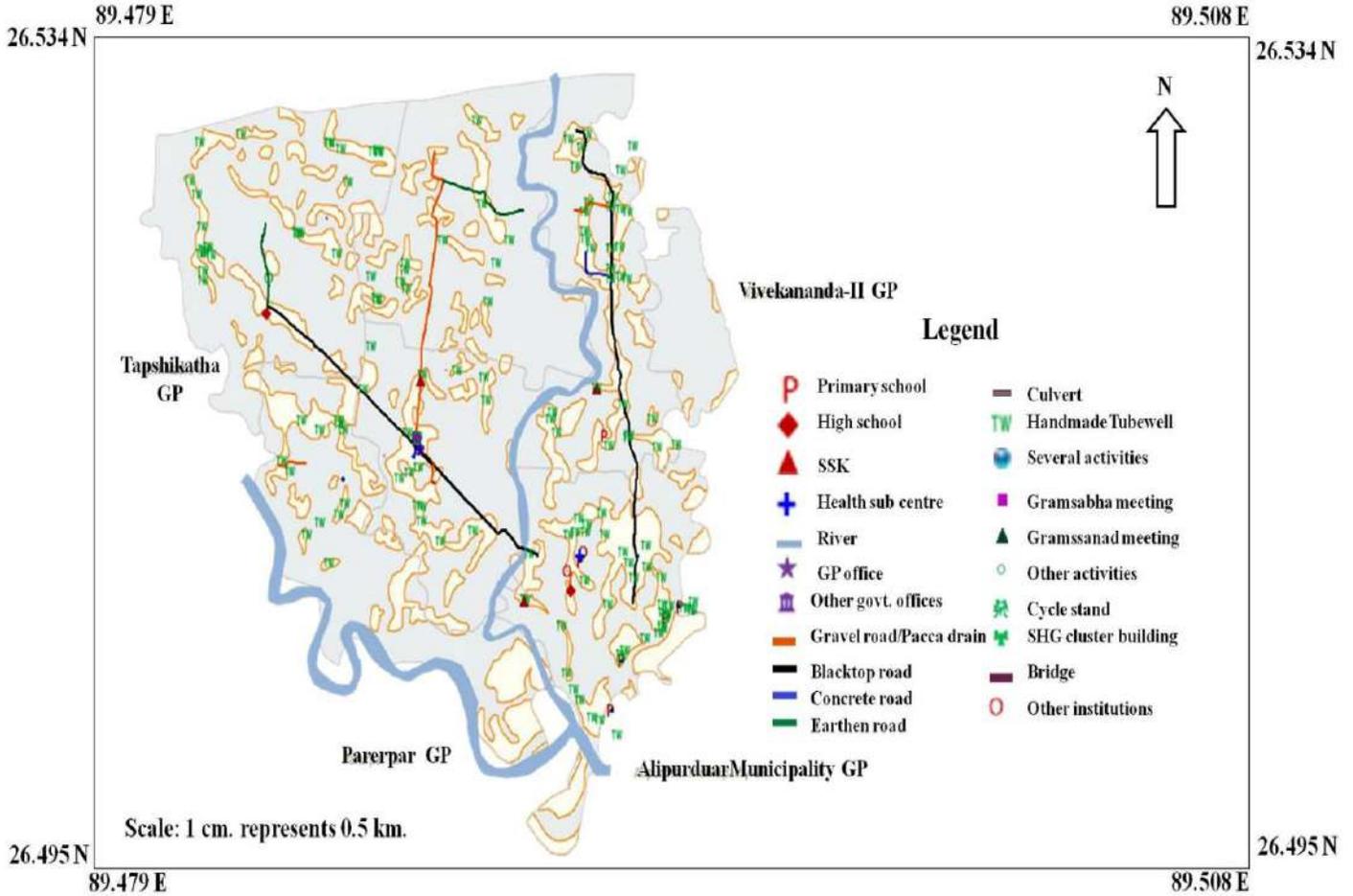
LANDUSE MAP OF PURULIA DISTRICT (2019)



Interpretation:-

In this land use map, there are vegetation in northern part and also in east and north-east, middle side of Purulia, which is high in density and indicated as green. We can noticed reticulated river which is flow from north to east and also some tributary river in the northern side of Purulia district, the river is mentioned by sky blue. There are agricultural land in all over the area of this locality and is highlighted by yellow. In the northern side and eastern side there are upland which is mentioned as grey. There are dense settlement pattern all over the area of Purulia district, this is highlighted in red colour. There are thick water body in north and east part of the area and also some water body can noticed all over the area of this map. The water body is indicated by deep blue.

Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block



Interpretation:-

In this planning map of Banchukumari gram panchayet of Alipurduar, we can see a river running from north to east and a tributary river is joined from north-east side of the area. There are four primary school in the east corner. Also there are two high schools and two SSK, health center, GP office, and other government office in the same direction. So we can say that many of these official buildings, education and health sector is located in the east corner of this area. In this block there have pacca drain and gravel road in the middle portion of the area. There are two blacktop road in the middle and east part of this block. Each locality have their own handmade tubewell. There are concrete road in the north and north-east side of this block.

WEST BENGAL STATE UNIVERSITY
(BHAIRAB GANGULY COLLEGE)

**REGIONAL PLANNING & RURAL DEVELOPMENT
LABORATORY NOTE BOOK (GEOPDSE04P)**

NAME – BITHIKA PAUL

ROLL – BGC/MGF/SIV/21,NO – 332

REGISTRATION NO – 1071921401429

SEMESTER – IV

LAB BOOK

Unit 1 : Rural Research Method & Methodology

1.1 Pre-field issues on rural research :

➤ **What is Research ?**

Research is defined as careful consideration of study regarding a particular concern or problem using scientific methods. In other words, research is a systematic inquiry to describe, explain, predict, and control the observed phenomenon. It involves inductive and deductive methods.

- **Inductive method** : Inductive approaches are associated with [qualitative research](#)
- **Deductive method** : Deductive approaches are associated with quantitative research

- ❖ **Qualitative research** involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research.
- ❖ **Quantitative research** is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations

➤ **Research data :**

Valid – founded, logical, rigorous, and impartial.

Accurate – free of errors and including required details.

Reliable – other people who investigate in the same way can produce similar results.

Timely – current and collected within an appropriate time frame.

Complete – includes all the data you need to support your business decisions.

➤ **Literature search on research problem stated :**

- Do literature review.
- Identify research gap.
- Identify research problem.
- Do the research.

➤ **Research hypothesis :**

INTRODUCTION :

Hypothesis is a tentative solution to a problem, it means before finding the results based on the review of literature we are going to formulate a hypothesis based on problem. When we are defining a problem, for example: problem of urbanization is more common in smaller cities compare to bigger cite based on this hypothesis based on this statement investigator can state the hypothesis .

WHAT IS HYPOTHESIS?

A hypothesis is a prediction, almost always a prediction about the relationship between variables. A hypothesis is a specific statement of prediction .

DEFINITION:

- ✓ A tentative statement about something, the validity of which is usually unknown (Black, James A & Dean J Champion, Method and Issues in Social Research, New York: John Wiley & Sons, Inc, 1976)
- ✓ Hypothesis is proposition that is stated in a testable form and that predicts a particular relationship between two or more variables. In other words, if we think that a relationship exists, we first state it as hypothesis and then test hypothesis in the field (Baily, Kenneth D, Methods of Social Research, 3rd edition, New York: The Free Press, 1978)

FUNCTION :

- ✓ Bringing clarity to the research problem
- ✓ Serves the following functions
- ✓ provides a study with focus
- ✓ signifies what specific aspects of a research problem is to investigate
- ✓ what data to be collected and what not to be collected
- ✓ enhancement of objectivity of the study
- ✓ formulate the theory
- ✓ enable to conclude with what is true or what is false

TYPES OF HYPOTHESIS :

- **Null Hypothesis vs. Alternative Hypothesis :**

Null Hypothesis (also called statistical hypothesis) states that there is no relationship between two variables. Example: We can take an example of ice cream. Child has formulated null hypothesis to his father stating that eating ice cream has no relation with running temperature, i.e., null hypothesis. Father is trying to say that eating ice cream has relation with running temperature, i.e., alternative hypothesis. In null hypothesis, researcher is trying to explain that relationships by chance, there is no statistically significant relation between two variables and a relationship is occurring just because of chance. However, in alternative hypothesis, we are trying to prove that there is a relation between eating ice cream and running temperature. Finally, when we are accepting hypothesis then null hypothesis would be rejected vice versa.

Hypothesis is prediction of what study will find it is an empirical statement verified and based upon observation or experience Hypothesis is testable to be true/false through the research study findings.

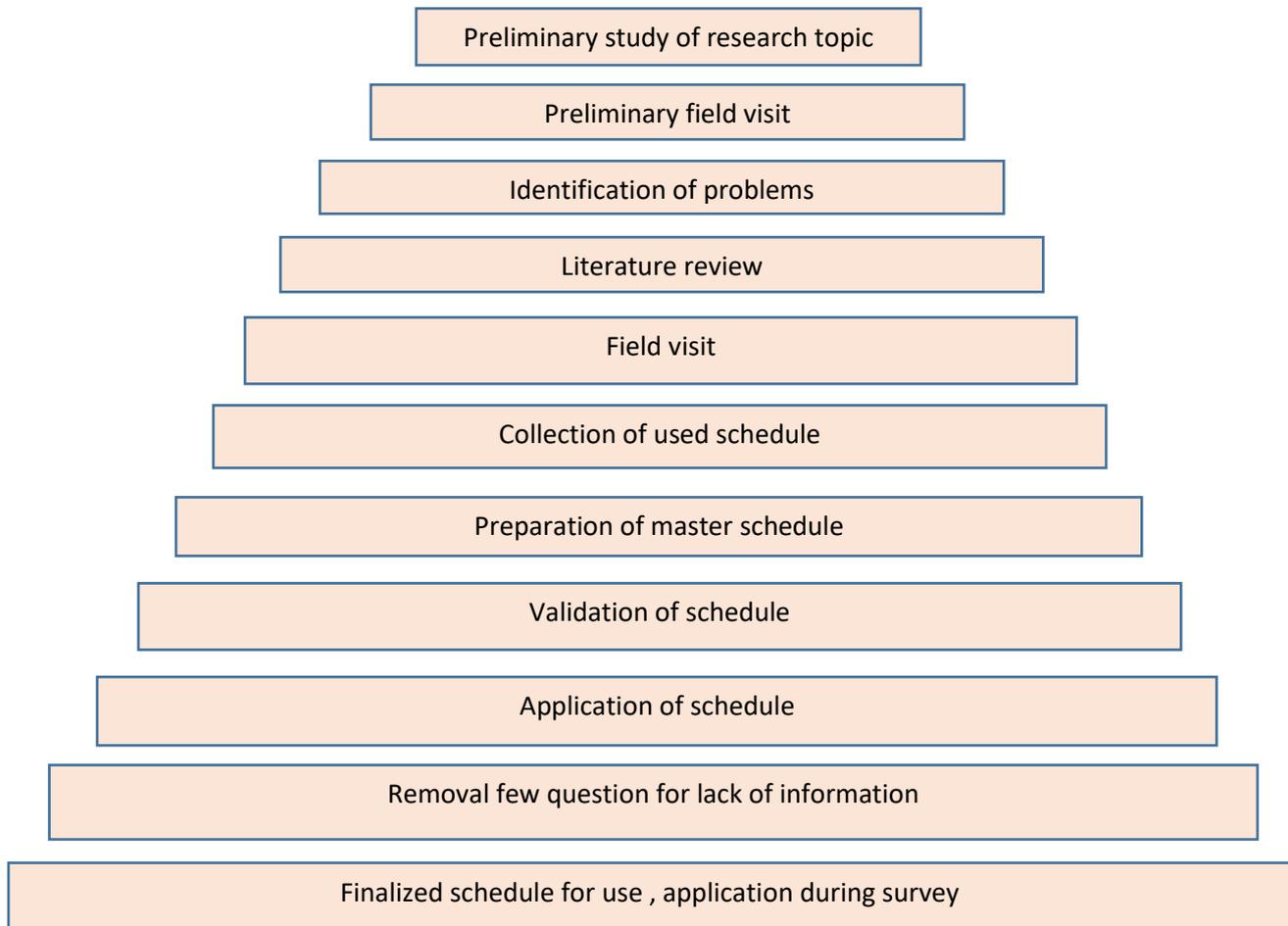
➤ **Selecting study area & Target population :**

- Identify the problem of a specific study area.
- No previous work on that problem.
- Select the problem for mitigation.
- Identify the victimized people.
- Do primary survey.
- Mitigate the problem.
- Do the research.

➤ **Collection Data :**

- Visit several websites.
- Visit several govt. offices.
- Justify authenticity and validity of the data
- Check the research requirements.
- Always update yourself about the availability of the data.
- Make research objective flexible enough to match the requirement of the data

➤ **Development of schedule :**



1.2 Field Techniques :

➤ **Focus Group Discussion :**

INTRODUCTION :

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perceptions attitudes, beliefs, opinion or ideas. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. It generally involves group interviewing in which a small group of usually 8 to 12 people.

It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

KEY FEATURES OF FDA :

- Involves organized discussion with a selected group of individuals to gain information about their views and experiences of a topic
- Particularly suited for obtaining several perspectives about the same topic
- Helps in gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation
- The role of the moderator is very significant, as good levels of group leadership and interpersonal skill are required to moderate a group successfully.

ADAVANTAGES & DISADVANTAGES :

Advantages of using focus group discussion are as follows :

- Free and open discussion among the respondents results in generation of new ideas that can be very useful for decision-making.
- A focus group is not static. The moderator can bring any changes in order to better facilitate the discussion during the group discussion. This dynamism allows better results in terms of information derived by a focus group.
- Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

The disadvantages of using focus group discussion are as follows:

- Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience. Inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally. The findings may be far from the actual.

SKILLS OF FDA :

Focus group discussion, like all research/study methods, it requires considerable skills, competencies and expertise such as:

- The researcher needs to be flexible and free of biasness and prejudices.
- A good understanding of the subject, problem, or topic to be investigated. This includes both theoretical knowledge and practical experience.
- Proficiency in the language in which discussions will be conducted. Focus group discussion cannot be conducted through an interpreter or by third person, no matter what types of skills he/she has.

UNIT 3 : TECHNIQUES & FORMULATION OF RURAL PLANNING THROUGH DATA ANALYSIS

3.1 Application of qualitative techniques :

➤ What is a stakeholder analysis?

Stakeholder buy-in and approval is just as much about communication, education, and visibility as it is about strategic alignment. Stakeholders must be able to quickly and easily understand where a new project or investment fits into the larger business picture.

A stakeholder analysis allows you to map out and establish the appropriate level of communication with your stakeholders relative to their influence and interest in your project. A thoughtful stakeholder analysis will prime you for the advocacy you need or prepare you for the opposition you anticipate.

How to perform a stakeholder analysis :

Performing a stakeholder analysis involves these three steps.

Step 1: Identify your stakeholders

Brainstorm who your stakeholders are. To do this, list all of the people who are affected by your work or who have a vested interest in its success or failure. Some of these relationships may include investors, advisors, teammates, or even family.

Step 2: Prioritize your stakeholders

Next, prioritize your stakeholders by assessing their level of influence and level of interest. The Stakeholder Power Interest Grid is the leading tool in visually assessing key stakeholders.

The position that you allocate to a stakeholder on the grid shows you the actions you need to take with them:

- **High power, highly interested people:** Fully engage these people, and make the greatest efforts to satisfy them.
- **High power, less interested people:** Keep these stakeholders satisfied, but not so much that they become bored with your message.
- **Low power, highly interested people:** Adequately inform these people, and talk to them to ensure that no major issues arise. People in this category can often be very helpful with the details of your project in a supportive role.
- **Low power, less interested people:** Again, monitor these people, but don't bore them with excessive communication.

Step 3: Understand your key stakeholders

Now that stakeholders have been identified and prioritized, you need to understand how they feel about your project. Some good questions to ask include:

- Do they have a financial or emotional interest in the outcome of your work? Is it positive or negative?
- What motivates them the most?
- Which of your project information is relevant to them, and what is the best way to relay that information?
- What is their current opinion of your work? Is that opinion based on accurate information?
- Who influences their opinion, and are those influencers also your stakeholders?
- If they're not likely to be supportive of your project, what can you do to win their support?
- If you can't win their support, what can you do to manage their opposition?

3.2 Application of statistical techniques in demographic data analysis :

➤ Occupational Structure :

INTRODUCTION :

- The term 'occupation' itself is indefinite as to both meaning and scope. It has a varying intellectual content and emotional association. In all modern languages, it has a number of synonyms and the range of meanings.
- The meaning of 'occupation' has undergone continuous changes from the times immemorial. So, its contents can be fixed definitely only for a short period of time.
- Generally, an 'occupation' of an individual refers to his trade, profession, type of work.
- Whereas 'structure' is the arrangement of and relations between the parts or elements of something complex.
- Therefore, occupational structure refers to the division of its work force engaged in different economic activities

SIGNIFICANCE :

- It reflects the close relationship between economic development and occupational structure.
- It gives proper illustration of ratio and spatial distribution of working and non-working population. – This relevant data have its own utility and role in policy making – The proportion of workers engaged in various occupation highlights economic and cultural development.

- The significance of occupational distribution of population of a region lies in the fact that, it clearly reveals the socio-economic characteristics of the people living that particular region. It is, hence, one of the important measures of socio-economic development of the country.

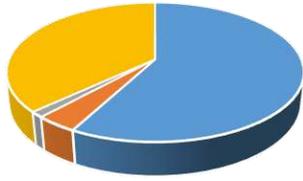
ECONOMIC COMPOSITION :

- Economic composition unfolds the diverse economic, demographic and cultural attributes of an area, which form the basis for region's social and economic development.
- However, the study of economic composition is handicapped by serious data gaps.
- Because not all the countries conduct their censuses regularly. Moreover, not all the countries that conduct their censuses collect the complete labour force data. Many countries, for example, restrict their statistical information to the size their work force and omit its distribution into various industrial or occupational categories.
- Furthermore, different countries may use different definitions and this lack of uniformity makes international comparisons difficult.
- The census organizations constitute the chief source of data.
- However, the recent efforts of the United Nations in the direction of the standardization of various concepts need to be appreciated. Apart from the census operations such sources like household surveys have also been utilized in advanced countries to collect specialized information pertaining to economic composition of a population. Such surveys are often resorted to for micro-level analysis.

: THE TABLE IS SHOWING , THE POPULATION COMPOSITION OF THE DIFFERENT SECTOR OF NORTH EAST STATE IN WEST BENGAL :

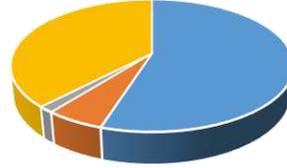
State	2001			
	cultivation	agriculture	household	others
Arunachal pradesh	57.8	3.9	1.3	37
Assam	39.1	13.2	3.6	44
Manipur	40.2	12	10.3	37.6
Meghalaya	48.1	17.7	2.2	32
Mizoram	54.9	5.7	1.5	37.9
Nagaland	64.7	3.6	2.6	29
Tripura	27	23.8	3	46.4
Sikkim	49.9	6.5	1.6	42
West bengal	19.2	25	7.4	48.5

Arunachal pradesh
2001



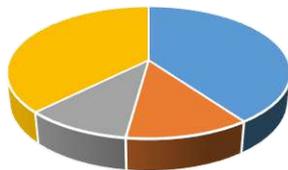
■ cultivation ■ agriculture
■ household ■ others

Mizoram
2001



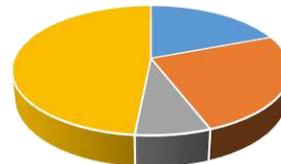
■ cultivation ■ agriculture
■ household ■ others

Manipur
2001



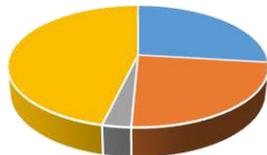
■ cultivation ■ agriculture
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West bengal
2001



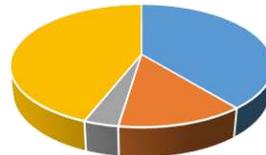
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Tripura
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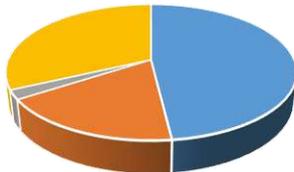
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Assam
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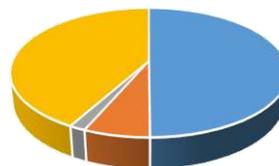
■ cultivation ■ agriculture
■ household ■ others

Meghalaya
2001



■ cultivation ■ agriculture
■ household ■ others

Sikkim
2001



■ cultivation ■ agriculture
■ household ■ others

➤ **Population composition :**

INTRODUCTION :

Population composition is the description of the characteristics of a group of people in terms of factors such as their age, sex, marital status, education, occupation, and relationship to the head of household. Of these, the age and sex composition of any population are most widely used. The number and proportion of males and females in each age group have considerable impact on the population's current and future social and economic situation.

AGE STRUCTURE :

The age structure of a population is one of the basic demographic characteristics and is helpful for demographic analysis and for socio-economic development planning. Generally, less developed countries have young populations, while more developed countries have old or ageing populations (Population Reference Bureau, 2011). The relative numbers of different age groups have a significant impact on social and economic policies and on the way people live their lives.

SEX RATIO :

The sex ratio is the ratio of males to females in a given population, usually expressed as the number of males for every 100 females. Sex ratios may vary due to different patterns of death and migration for males and females within the population. For example, males are more vulnerable to wars and more likely to be mobile and migrate to other regions or countries, which would affect the sex ratio within the population, especially for young adult males.

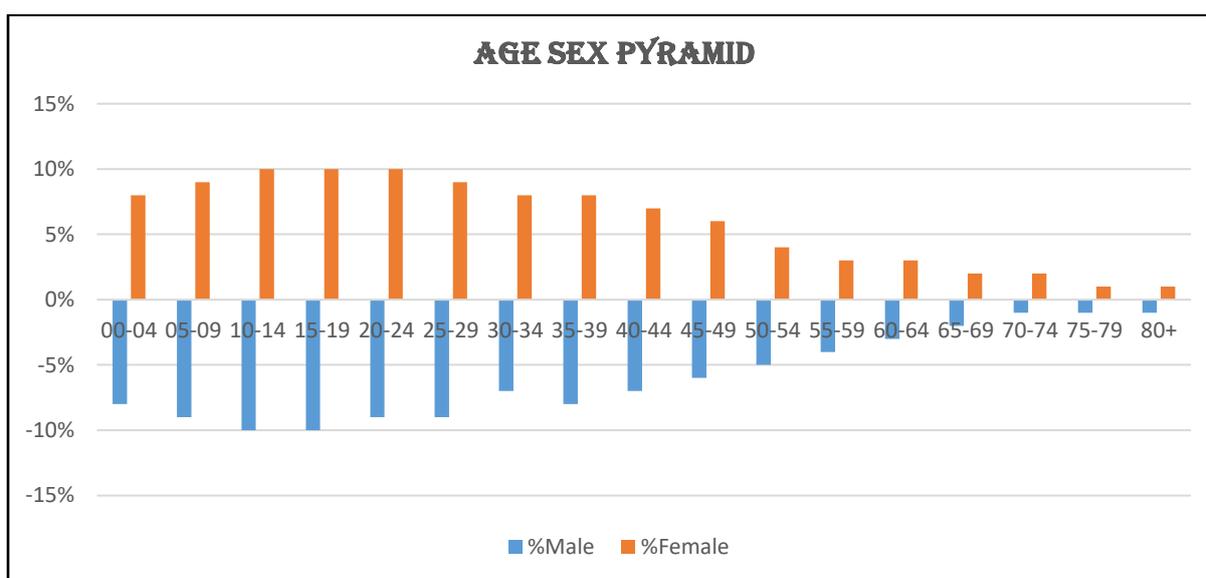
POPULATION PYRAMID :

Both key variables of age and sex are combined in the population pyramid. A population pyramid is a graph which displays a population's age and sex composition. The numbers or proportions of males and females in each five-year age group are represented using horizontal bars. Population pyramids of countries can differ markedly as a result of past and current patterns of birth rates, death rates and migration.

:TABLE FOR AGE SEX PYRAMID:

Age Group	Male	Female	Total
00-04	37,43,862	35,89,281	7333143
05-09	42,16,763	40,31,046	8247809
10-14	46,77,506	44,79,017	9156523
15-19	47,02,325	43,55,706	9058031
20-24	44,22,630	43,35,692	8758322
25-29	40,44,904	39,53,005	7997909
30-34	34,64,659	33,76,931	6841590
35-39	35,23,361	34,89,285	7012646

40-44	32,19,604	29,33,456	6153060
45-49	28,14,212	25,21,507	5335719
50-54	23,17,232	19,40,648	4257880
55-59	17,46,903	15,21,747	3268650
60-64	14,06,401	13,39,053	2745454
65-69	9,91,280	9,91,713	1982993
70-74	6,86,881	7,03,726	1390607
75-79	3,60,216	3,79,551	739767
80+	4,06,536	4,77,025	445803
Total		4,44,18,389	90725906



➤ **Dependency Ratio :**

The dependency ratio is an agepopulation ratio of those typically not in the labor force (the dependent part ages 0 to 14 and 65+) and those typically in the labor force (the productive part ages 15 to 64). It is used to measure the pressure on the productive population.

FORMULA :

In total published international statistics , the dependent part usually includes those under the age of 15 and age of over the 64 . The productive part makes up the population in between ages 15-64 . It is normally expressed as a percentages :

$$\text{Dependency ratio : } \frac{\text{(no of people aged 0 to 14)+(no of people aged 65)}}{\text{No of people aged 15 to 64}} \times 100$$

As the ratio increases there may be an increased burden on the productive part of the population to maintain the upbringing and pensions of the economically dependent . this

results in direct impacts on financial expenditures on things like social security , as well as many indirect consequences .

➤ **Migration :**

Regardless of whether direct questions on migration have been asked in the census, it is possible to estimate net inter censal migration on the basis of census counts of the population of component areas at two successive censuses along with some additional information that is normally available from the censuses or from other sources.

The population increment between any two dates for any given geographic area is the result of natural increase (births minus deaths) and net migratory movement. If the country is a closed one as far as population growth is concerned, i.e., if there has been virtually no migration between the given country and other countries, then the net migratory movement for a given geographic area must be the result of internal migration, i.e., in-migration minus out-migration. Where the population is not closed, problems arise in measuring the effects of internal migration. These are dealt with in the .discussion of specific techniques.

Given the population of an area at two points in time and an estimate of natural increase during the interval, we can calculate the number that would be expected at the end of the interval in the absence of migration. The difference between the observed and expected numbers at the end of the interval, or the difference between the observed and the expected change, gives an estimate of" net change due to migration. Approaches to estimating the expected population or the expected change are of two types: (a) through vital statistics and (b) through the use. of estimates of the probability of survival. Applications of these approaches are discussed below.

VITAL STATISTICS METHOD (VS) :

Where reliable statistics of births and deaths to the residents of each component area of a country are available, it is possible to estimate the natural increase between two census dates or between any two dates for which the population is known. The estimate of net migration is then obtained by subtracting the natural increase from the total population change. This "balancing equation" can be put in the following simple form:

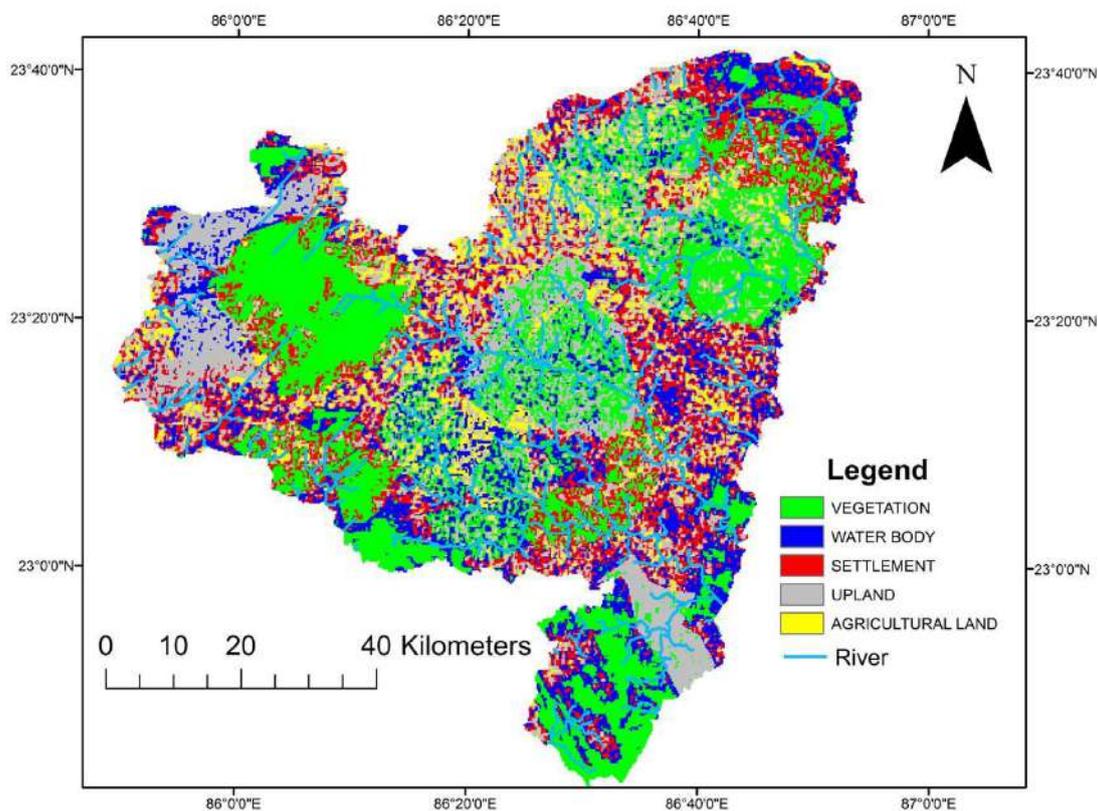
$$\text{Net M} = (P_1 + n) - P_0 - (B - D)$$

where for any given area Net M = net migration, P₀ is the population at the earlier census ,P₁+ n is the population at the later census, B is the number of births that occurred to residents of the area during the inter censal period, and D is the number of deaths that occurred to residents of the area during the same period.

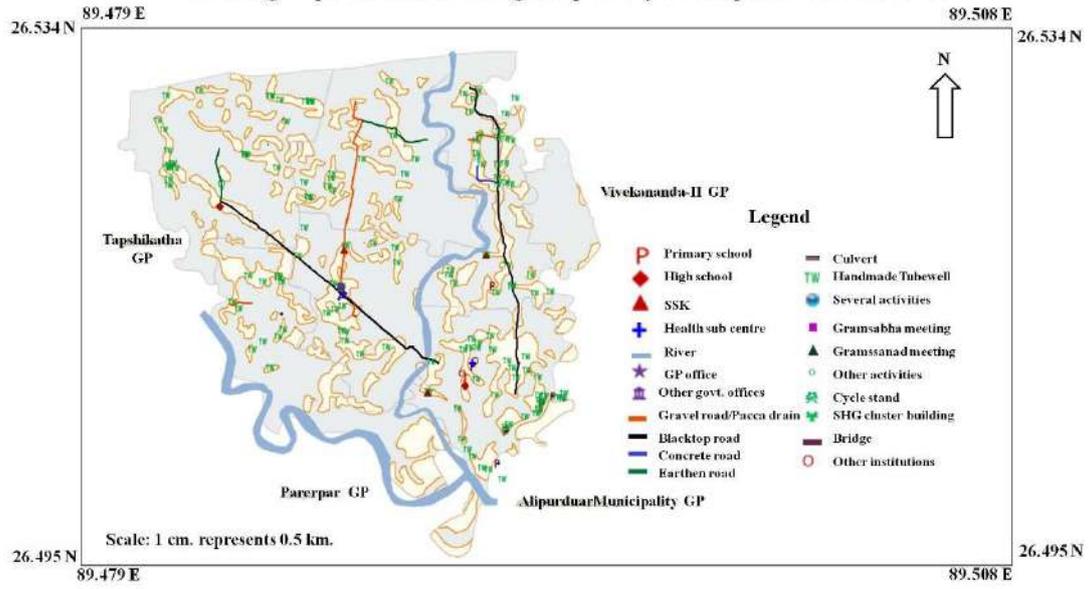
3.3 APPLICATION OF GIS & RS : PREPARATION OF LANDUSE MAP & SPACIAL PLAN FORMATION & LAYOUT FOR A GRAM PANCHAYAT

- Conducts social mapping to illustrate the layout of houses, streets, hamlets and infrastructure in the village
- Identifies the most ideal locations to open schools
- Helps in making assessment regarding the status of the village, infrastructure facilities and employment opportunities
- Identifies the infrastructural and other development needs of the village
- It helps in analysis, planning and decision making activities at the rural level by overlaying the demographics of the population like literacy rate, number of workers, age etc.
- It also helps in determining the road networks i.e. the national highways, state highways with major rivers and forest around the particular village.

Landuse Map of Bankura District (2019)



Planning map of Banchukamari gram panchayet of Alipurduar-I C.D. block





Dissertation on

Dam's Impact on Downstream: A case study on the Effect Of Sarengkheda Dam On The Tapi River Downstream In Nandurbar District, Maharashtra



WEST BENGAL STATE UNIVERSITY



BHAIRAB GANGULY COLLEGE



DISSERTATION PROJECT REPORT (APPLIED GEOMORPHOLOGY)

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TO WHOM IT MAY CONCERN

This is to certify that Sri/ Smt Manas Utthasini

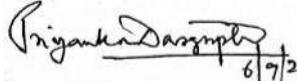
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Dam's Impact on Downstream: A case study on the Effect of Sarengkheda Dam on the
Tapi River Downstream in Nandurbar District, Maharashtra

under the guidance of the undersigned teacher.

Wish him/her Success


6/9/21

Signature of the Supervisor

PREFACE

Geomorphology is a field common to geography and geology. It tries to understand the form of the land surface of the earth and its evolution in relation to structure, exogenic and endogenic processes and the factor of time. In brief, geomorphology is the study of landforms of their materials which make them and the process that shape them.

In the present study entitled “effect of sarengkheda dam on Tapi river downstream in Nandurbar district, Maharashtra” has been made firstly to study some important effect of sarengkheda dam on hydraulic parameters, sediment load and bed elevation and secondary to find out the changes of channel width, channel surface water area, bar area etc. for the construction of sarengkheda dam on the selected study reach of the Tapi river downstream.

Such a study requires knowledge of minute concerted aspects, intensive research work qualification. The present work does not go into such details because of limited allotment of work, shortage of time and lack of financial assistance. The author, however accepts without hesitation that this is not a complete geomorphic study. But he is not bold enough to say that this is very small work is a burble contribution to field of applied geomorphology.

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ABSTRACT

This dissertation study describes the changes in hydraulic geometry of the Tapi River downstream of sarengkheda Dam have been investigated since 1985. The study reach is 8.5 km long from the sarengkheda Dam to the sarengkheda gauging station, in near sarengkheda village of Nandurbar district of Maharashtra. This study describes changes in water discharges, sediment loads, mean channel-bed elevation, bed-degradation and channel width of downstream from sarengkheda dam constructed on Tapi River. The geographic information system (GIS) analysis of a time series of satellite images taken in 1985, 2008,2010,2014 and 2020 showed that the variation of non-vegetated active channel width decreased an average of ... m (...% width reduction since 1985). The annual flow volume decreased from 17.48 cubic metre in billion in 2006 to 3.28 cubic metre in billion in 2014, the average pre dam to post dam annual flow volume decreased up to 5.93 cubic metre in billion over the downstream for construction of the sarengkheda dam and the mean bed elevation of the reach decreased from 112.74 m to 111.35 m from 1985 to 2014. The bed elevation changes should affect primarily the 8.5 km reach immediately downstream of the sarengkheda dam. Flood peaks generally were decreased by the sarengkheda dam, but in other respects the post-dam water-discharge characteristics varied from time to time because when water is released from the dam, a huge amount of water is released. The river channel Bed degradation varied from negligible to about up to 1.25 m over the 8.5 km reach downstream of the sarengkheda dam cross sections studied. In general, most degradation occurred after the dam construction. Channel width can increase, decrease, or remain constant in the reach downstream from sarengkheda dam. In the face of the major variation, changes at a cross section in streambed elevation and in channel width with time often can be described by the interpretation of cross sectional data and satellite images.

CHAPTER 1

Introduction

1.1 Introduction:

Water is essential for all kinds of life on earth. It is not evenly distributed throughout the world and even in one place its availability is not uniform year after year. While parts of the water-scarce world are at risk for drought, other parts of the world, which have plenty of water, face the daunting task of managing the availability of water freely. There is no doubt that rivers are a great gift of nature and have played an important role in the evolution of different civilizations, yet at different times during the floods, the rivers continue to destroy the lives and property of the people. Therefore river water management is one of the major issues to consider. Since the advent of civilization, people have built dams and reservoirs to store the surplus river water available during wet periods and for the same use during periods of desperation. Dams and reservoirs around the world have been playing a dual role in accelerating socio-economic growth and alleviating the plight of the world's large population suffering from floods and droughts.

Dam is a barrier that is built on the banks of the river to create reservoirs that are impervious to nature and flow is hydraulic structures built for various purposes. These are used to increase the amount of water available for hydroelectric power generation, to reduce the discharge of flood water caused by large storms or heavy snowfalls, or to deepen the waters of naval rivers, and to improve navigation. Dams and reservoirs make a significant contribution to meeting the following basic human needs which are water for drinking and industrial use, Irrigation, Flood control, Hydro power generation, Entertainment etc. Planning for their construction and other engineering work involves geography data. They also meet the needs of human insecurity by reducing or preventing floods. During excess water flow, dams accumulate water in the reservoir; they then release that water during short flows, even when the natural flow of water is insufficient to meet demand. When engineers design and maintain dams, they expect to make sure they remember all the objectives.

Ancient Mesopotamians may have been the first people to build dams. The oldest dam is the Jawa Dam in present-day Jordan. It dates back to the fourth century B.C.E. The dams provided a source of stagnant water for farmers to irrigate their crops. This gave the ancient Mesopotamians the opportunity to feed the growing population.

During the Industrial Revolution, engineers began building large dams. These industrial-sized dams can hold more water for electricity to large machinery of factories and mines. They can turn giant turbines to generate electricity. The era of the "big dam" building in America in the early 1900's began with an increase in electricity demand. During the Great Depression, President Franklin D. Roosevelt delayed Americans from building huge dam projects. Among of these the most famous is the Hoover Dam.

Dams have long been seen as a symbol of human curiosity. However, ecologists studying rivers and lakes have discovered lower parts of the environment in the construction of dams. Dams alter the effectiveness of rivers and, in some cases, can harm the local fish population.

The application of remote sensing and GIS techniques in hydrology is one of the most effective methods today. Recently, remote sensing has provided valuable datasets for examining hydrological changes and morphological changes over large areas of various spatial and temporal scales.

Dams also have negative effects on the environment such as blocking fish migration, trapping silt traps, changes in temperature, chemical composition, dissolving oxygen levels and physical properties of reservoirs are often unsuitable for aquatic plants and animals. Dams change the effectiveness of rivers. They can cast silt nets, bury rocks in riverbanks where fish live. Pebbles, logs and other important food and habitat features may also be trapped behind the dam. This negatively affects the construction and maintenance of more complex habitats (e.g., refills, pools) flow currents. Geology is playing an important role in the construction and protection of dams.

1.2 Literature Review

To increase my knowledge about this topic, a number of reports, journals and various research articles were studied. The main purpose of the literature review is to gain an understanding of my research topic and existing research relevant to my field of study. This literary review will help me strengthen my knowledge and be able to identify the key to my subject. A dam is a barrier that stops the flow of surface water or groundwater. Reservoirs built by dams not only suppress floods, but also provide water for irrigation, human use, industrial use, aquaculture and navigability. The existing geomorphology literature provides useful guidance on how dams can be affected by changes through altered channel processes, as well as metrics that can be applied to quantify the spatial magnitude of dam effects.

According to **Michel Tchotsoua, Aboubakar Moussa, Jean-Marie Fotsing;2008**, Dams have been developed as an important means of meeting perceived demand for water and energy and as a long-term strategic investment, with many additional benefits. Some of these additional benefits are common to all large public infrastructure projects, others are unique to dams and specific to specific projects. Building an industrial base with regional development, job creation and export potential is often cited as an additional consideration for the construction of large dams. It causes floods that sometimes have a profound effect on crops and infrastructure (housing, granules, bridges, wells and roads).**Kwawdo Owusu, Peter Bilson Obour and Maame Asiwah Nkansah;2017**, has shown their studies Dam construction affects the livelihood of the people living on the banks of the river. Further studies are needed on dam development policies and management to protect the livelihoods of local river users.**Jane s. Fencl, Martha e. Mather, Katie h. Costigan, Melinda d. Daniels; 2015**, described The backwater effect of the dams creates waterlogging in the aquifer, creating the

width of the aquifer flow and the depth below the flow below the dam, the spatial extent of these effects depends entirely on the channel geometry of the local system, the channel operation and the dam height. The combination of backwater pond impact and partial sediment excavation during high flow of waterlogging is thought to maintain this greater depth and prevent complete sediment infiltration of the backwater zone. Second, the combination of some silt nets and high energy acceleration trapped in the lowlands during low flow creates bed and arrow piers as they flow over the low-head embankment, in some cases creating deep immersion pools and mid-channel bars. The construction of the dam has reduced the organic matter and enrichment of water fungi in the reservoirs and reached low currents, but the flowing lakes have increased the amount of soil microorganisms in the wetlands. Dams around the world have damaged biodiversity hotspots and habitats. To meet the needs of water, energy and transportation, people have crossed more than 300 giant dams (more than 150 meters high, with reservoirs over 15 million m³ or more than 25 kilometres of reservoirs) and an astonishing number of small dams (172 out of 292) worldwide, Large rivers have been broken. (Chen et al., 2016; Nilsson et al., 2005). Dam construction has drastically changed the wetland ecosystem compared to other ethnographic activities (Tang et al., 2008; Lees et al., 2016). It inevitably induces changes in river flow systems, sediment systems and wetland morphology and geology (Wu et al., 2013; Donohue and Molinos, 2009). The effects of dam construction on biodiversity have attracted researchers, environmentalists and wildlife advocates around the world (Wu et al., 2015; Jacobsen et al., 2012). Dam construction can affect Bent house with changes in water flow, temperature, water quality, level, availability of food, and other physicochemical parameters of water in reservoirs and low-lying areas (Smolar Zvanut and Mikos, 2014; Chen et al., 2015). The construction of the dam has enriched the water body organic matter and enriched the reservoir and reduced the downstream flow, probably due to the reduction in the flow of cool water under the reservoir and the dam (Xu et al., 2012; Colas et al., 2016; Menendez et al., 2012). Dam construction has changed the macro uninterrupted community structure. In general, the number of tolerant taxa (species that are able to absorb and tolerate pollution) has increased, and the number of intolerant taxa (species that are susceptible to turbulence and pollution) has decreased (Mantel et al., 2010). Dam construction can also affect the growth of oysters. Immediately downstream oysters from the dam grew faster than the population of up and down streams, resulting in a significant increase in water temperature (Singer and Gangloff, 2011). Blocking migration routes could disrupt bi-directional gene flow in fish populations and develop a new interstitial structure with the risk of genetic diversity and stochastic extinction (Esguícero and Arcifa, 2009; Winans et al., 2014).

An international journal, Lost in development's shadow: The downstream human consequences of dams. Water Alternatives 3(2): 14-42 , Richter, B.D.; Postel, S.; Revenga, C.; Scudder, T.; Lehner, B.; Churchill, A. and Chow, M. 2010, describes that River currents altered by large dams often disrupt or destroy river flows and life cycle sources for fish and other river species, as well as fishing, cropping, and grazing that rely on flood-plain ecosystems. Although river-dependent communities may benefit somewhat from flood protection and improved irrigation opportunities provided by dams, adverse effects are more common and generally outweigh the benefits to people at the bottom of the river resulting in reduced income and

livelihoods. The construction of dams has resulted in the largest change in human habitat on riverbanks worldwide, changing the natural flow of rivers through water (Dynesius and Nilsson 1994; Nilsson et al. 2005; Van Looy et al. 2014). According to Goldman 1976; Baxter 1977; Graf 2006, The waterlogging of the dam changes the structure and function of the rivers in various ways including: (i) flooding of nearby habitats; (ii) reduction of water velocity; (iii) sedimentation, organic debris, chemical contaminants and nutrient conservation; (iv) changes in water temperature, and dissolved oxygen content; And (v) channel geological changes. After Lane, 1955, Rivers respond to dam construction in a variety of ways, reflecting the relative balance between the amount and type of sediments transported and the changes in discharge and operation. Dams effectively trap all of the silt loads upstream; And in cases where there is little silt input on the river bank from the dam to the river flow, bed slits and channel narrowness may occur. (Wolman, 1984; Chien, 1985; Babiński, 1997; Brandt, 2000; Grant et al., 2003; Magilligan and Nislow, 2005; Petts and Gurnell, 2005; Graf, 2006).

1.3 Objectives

Each and every Dissertation work has some basic objectives. Here the focus is on the variations in hydrologic and sediment regimes, and the changes in water discharge bed material, bed elevation, active channel width, and channel plan form geometry in pre dam and post dam condition. Some prime objectives of this dissertation work are given below:

- To show the Possible Effects of the Sarengkheda Dam on the Tapi River Downstream Discharge that is the Changes in Annual flow volume, Average Ten daily peak discharge, Total non-monsoon discharge on pre Dam and post Dam situation and its impact on sarengkheda dam
- To show the changes in Maximum gauge height and its impact on flood magnitude in downstream for sarengkheda dam
- To understand the Possible Effects of the Sarengkheda Dam on the Tapi River Downstream Sediment Load.
- To analyse the changes of river bed elevation and degradation of the study area on Tapi river downstream by construction of dam.
- To predicting channel changes until 2019 and specifically analyse lateral variations in channel width.

1.4 Methodology

Data and methods

In this dissertation, impact of dam on downstream reach is seen. The paper mainly emphasizes on impact of Sarengkheda dam on Tapi River downstream. So in this respect, the source of data and methodologies are-

1.4.1 Data source:

The data has been collected from various sources for different types of analyses, related to this dissertation topic.

Table no. 1: Data source and purpose of these data:

DATA	SOURCE	PURPOSE
Water discharge	India Water Resources Information System (https://indiawris.gov.in)	Average ten daily peak discharge and its dam impact diagram, annual flow volume and its impact on dam diagram, Total and mean non-monsoonal discharge diagram, scatter plot for showing the relationship between mean daily discharge and mean daily gauge height and also maximum gauge height diagram for showing flood magnitude.
Sediment load	India Water Resources Information System (https://indiawris.gov.in)	Total sediment load diagram, Diagram of the dam impact on total sediment load, scatter plot for showing the relationship between annual discharge and annual sediment load.
Bed elevation	India Water Resources Information System (https://indiawris.gov.in)	Mean bed elevation and its impact on dam diagram, changes in cross profile diagram and bed degradation diagram.
Landsat satellite image	USGS Earth Explorer (earthexplorer.usgs.gov)	Channel Surface water area change map, channel deposition change map, various change river bank shifting and bar formation of the channel.
SRTM DEM	USGS Earth Explorer (earthexplorer.usgs.gov)	Tapi river basin map with location map

1.4.2 Methodology:

The different type of data analysis methods are:-

1.4.2.1 Hydraulic analysis: Discharge is the amount of water that flows per unit, usually expressed in cubic metre per second of per day. Water discharge data has been collected from the India-WRIS website for this dissertation work. All of these data are used to determine the effect of Sarengkheda dam on the Tapi River's downstream on the annual flow volume, average ten Daily Peak discharge, the maximum gauge height for showing flood magnitude in pre dam and post dam. Total non-monsoon discharge is shown based on this water discharge data. Also the relationship between Mean daily discharge and mean daily gauge Heights is shown in pre dam and Post Dam condition and how the Annual Discharge was in pre dam and Post dam has also been shown to depend on all these data.

To derive the impact of Sarengkheda dam (constructed in 2007) on the annual flow volume, average ten Daily Peak discharge, the maximum gauge height, Total non-monsoon discharge in pre dam impoundment (1985 to 2006) and post dam impoundment (2008 to 2014), used water discharge data from 1985 to 2014 which is

collected from India-WRIS website and making diagram using Ms excel software (Ms excel 2013 version). Here the indices and formula used to determine the dam impact on downstream related to water discharge data are

Table no. 2: Formula of Hydraulic Analysis Parameters:

Parameters	Formula	Formula explanation
Annual flow volume (in m ³)	$\sum(Q \times 24 \times 3600)$	Q = Daily water discharge of the selected year in cusec
Average ten daily peak discharge (cusec)	$(\sum Q_{10})/36$	Q ₁₀ = Total ten daily highest discharge in the selected year in cusec
mean daily discharge (cusec)	$(\sum Q)/365$	Q = Daily water discharge in cusec
Total non-monsoon discharge per year (cusec)	$\sum Q_n$	Q _n = January to May and November to December water discharge of the selected year
Maximum gauge height showing flood magnitude (m)	Max _{gh}	Max _{gh} = Maximum gauge height of the selected year in metre
mean daily gauge height (m)	$(\sum gh_y)/365$	gh _y = Total daily gauge height of one year in metres

1.4.2.2 Sediment analysis: The amount of sediments transported through the stream cross section for one year is refer to the load of the sediment. Sediment data of the Sarengkheda gauging station, from 1985 to 2014 has been collected from the CWC website (www.India-WRIS.gov.in). The total sediment load per year and annual suspended sediment concentration are calculated before and after the construction of the dam to understand the effect of the dam on the sediment load on downstream of the Tapi River of the study area.

To understand the impact of dam on the annual suspended sediment concentration (t/m³), the daily suspended sediment concentration (g/l) data converted to total suspended sediment concentration (g/l) of the selected year by sum of the SSC (g/l) data of the selected year and then the total SSC (g/l) converted to annual suspended sediment concentration (t/m³) by multiplying 0.001. For example in 1985, of the Sarengkheda gauging station, the total suspended sediment concentration is 93.148 g/l and it converted to annual SSC (t/m³) by multiplying 0.001. So the annual SSC (t/m³) is (93.148 * 0.001)= 0.093148 t/m³.

And to predict the impact of dam on the total suspended sediment load (tonnes), the total suspended sediment concentration (t/m³) converted to total sediment load (tonnes) by multiplying annual flow volume (m³).for example in 2014, the total suspended sediment concentration (t/m³) is 0.093148 t/m³ and it converted to total sediment load (tonnes) by multiplying annual flow volume (m³) which is 3196316160 m³ of the Sarengkheda gauging station. So the total sediment load is 0.093148 t/m³ * 3196316160 m³ = 297730457.7 tonnes. The formula of the Total sediment load (tonnes) and Annual suspended sediment concentration (t/m³) are given below

Table no. 3: Formula of Sediment analysis parameters:

Parameters	Formula
Total sediment load (tonnes)	Total suspended sediment concentration (t/m ³) * annual flow volume(m ³)
Annual suspended sediment concentration (t/m ³)	Total suspended sediment concentration (g/l) * 0.001

1.4.2.3 Bed Elevation: Bottom of a river is referred to as river bed. Here all the bed elevation data of Sarengkheda gauging station from 1995 to 2014 collected from India-WRIS Website (www.India-WRIS.gov.in). The annual mean bed elevation and bed degradation are calculate to understand the impact of before and after construction of Sarengkheda dam on the bed elevation of Tapi River of the study area.

India-WRIS (www.India-WRIS.gov.in) had provided the bed elevation data for different various years from which we have calculated the mean bed elevation for each year. And to determine the bed degradation (m), mean bed elevation (m) of the selected year was subtracted from mean bed elevation of the year before dam impoundment. For example of Sarengkheda gauging station in 2014, the mean bed elevation is 111.35 m and before dam impoundment year's mean bed elevation is 112.39 m. so here the bed degradation is (112.39 - 111.35) = 1.04 m., the formula for calculate the mean bed elevation (m) and bed degradation(m) are given below

Table no. 4: Formula of Bed elevation parameters:

Parameters	Formula
Mean Bed Elevation(m) per year	sum of bed elevation(m) of one year / 365
Bed degradation (m)	mean bed elevation of the selected year – mean bed elevation of the year just before dam impoundment

1.4.2.4 Percentage change: Percentage change is a general mathematical concept that represents the degree of change over time. Percentage change can be applied to show any degree of change that can be measured over time. Here, Positive values indicate a percentage increase whereas negative values indicate a percentage decrease. The formula for calculate the percentage change is given below

$$\text{Percentage change} = \frac{\text{Post dam} - \text{pre dam}}{\text{Pre dam}} \times 100\%$$

For example, to derive the percentage change of annual flow volume (cubic metre in billion), post dam condition (2008 to 2014) 7 year average annual flow volume (cubic metre in billion) is 5.89 cubic metre in billion and pre dam condition (2000 to 2006) 7 year average annual flow volume (cubic metre in billion) is 11.82 cubic metre in billion. So the percentage change of annual flow volume (cubic metre in billion) is [(5.89

$- 11.82/11.82\} \times 100\%] = (-50.16)$. Hence, after the dam construction percentage of annual flow volume (cubic metre in billion) is decreased.

Here, percentage change is used to determine the change of percentage of annual flow volume, ten daily peak discharge, non-monsoon discharge, sediment load, and maximum gauge height for understand the impact of sarengkheda dam on Tapi River downstream of the study area.

1.4.2.4 Landsat satellite image: To understand the impact of Sarengkheda dam on Tapi river downstream, a few Landsat satellite images have been downloaded from USGS Earth Explorer (earthexplorer.usgs.gov) before and after the dam construction's year to understand how the dam has affected the downstream of the Tapi river, such as Channel Surface water area change, channel deposition change, bar formation etc. for this, First go to **Earthexplorer.usgs.gov** website and download the specific study area satellite images from there and then digitize these satellite images through QGIS software. And then these different maps mentioned above have been created using QGIS software (version 3.20). Below is the information of all these Landsat satellite images.

Table no. 5: Details of Landsat satellite images:

Year	Date	Landsat Sensor	Band Combination		
			Band	Wavelength (micro meters)	Spatial resolution (meters)
1996	13/11/1996	LANDSAT_5 TM	Band 1 visible	0.45 - 0.52	30
			Band 2 visible	0.52 - 0.60	30
			Band 3 visible	0.63 - 0.69	30
			Band 4 Near-Infrared	0.76 - 0.90	30
			Band 5 Near-Infrared	1.55 - 1.75	30
			Band 6 Thermal	10.40 - 12.50	120
			Band 7 Mid-Infrared	2.08 - 2.35	30
2006	16/10/2006	LANDSAT_7 ETM	Band 1 Blue	0.45 - 0.515	30
			Band 2 Green	0.525 - 0.605	30
			Band 3 Red	0.63 - 0.69	30
			Band 4 NIR	0.75 - 0.90	30
			Band 5 SWIR1	1.55 - 1.75	30
			Band 6 TIR	10.40 - 12.5	60
			Band 7 SWIR 2	2.09 - 2.35	30
			Band 8 Pan Band	0.52 - 0.90	15
2010	20/04/2010	LANDSAT_5 TM	Band 1 visible	0.45 - 0.52	30
			Band 2 visible	0.52 - 0.60	30
			Band 3 visible	0.63 - 0.69	30
			Band 4 Near-Infrared	0.76 - 0.90	30
			Band 5 Near-Infrared	1.55 - 1.75	30
			Band 6 Thermal	10.40 - 12.50	120
			Band 7 Mid-Infrared	2.08 - 2.35	30
			Band 1 Coastal	0.43 - 0.45	30
			Band 2 Blue	0.45 - 0.51	30
			Band 3 Green	0.53 - 0.59	30

2019	21/05/2019	LANDSAT_8 OLI_TIRS	Band 4 Red	0.64 – 0.67	30
			Band 5 NIR	0.85 – 0.88	30
			Band 6 SWIR 1	1.57 – 1.65	30
			Band 7 SWIR 2	2.11 – 2.29	30
			Band 8 Pan	0.50 – 0.68	15
			Band 9 Cirrus	1.36 – 1.38	30
			Band 10 TIRS 1	1.36 – 1.38	100
			Band 11 TIRS 2	11.5 – 12.51	100

These 4 satellite images has digitized the channel with length from sarengkheda dam to sarengkheda gauging station and bar area through QGIS software(version 3.20) to create channel planform map of the study reach. For showing Changes of Channel width from 1996 to 2019 map, channel areas of four years have been digitised and five cross sections have been drawn through QGIS software. This cross section is then measured by the software's Length Measurement tool, showing at how much the channel width has increased or decreased in these years. This 5 cross section lines has been drawn between the downstream of Tapi River from Sarengkheda Dam to Sarengkheda Gazing Station and then the final change has been made with the help of this software. In order to calculate the water surface area of these four years, the water surface areas are digitised through QGIS software and area measurement is done through the geometry tool of this software. And to calculate bar area, these four years bar area of Tapi river downstream located in these satellite image's has been digitized and then the bar area is calculated by the geometry tool of this software. Thus the work of the channel platform has been completed.

1.4.2.5 SRTM DEM of Tapi River: The SRTM DEM (Digital Elevation Model) data has been collected from usgs earth explorer (earthexplorer.usgs.gov) website to showing the Tapi river basin map with location map. Tapi river basin map has been created through ArcGIS software (version 10.4).

2.0 Study Area

Chapter 2

Location Map

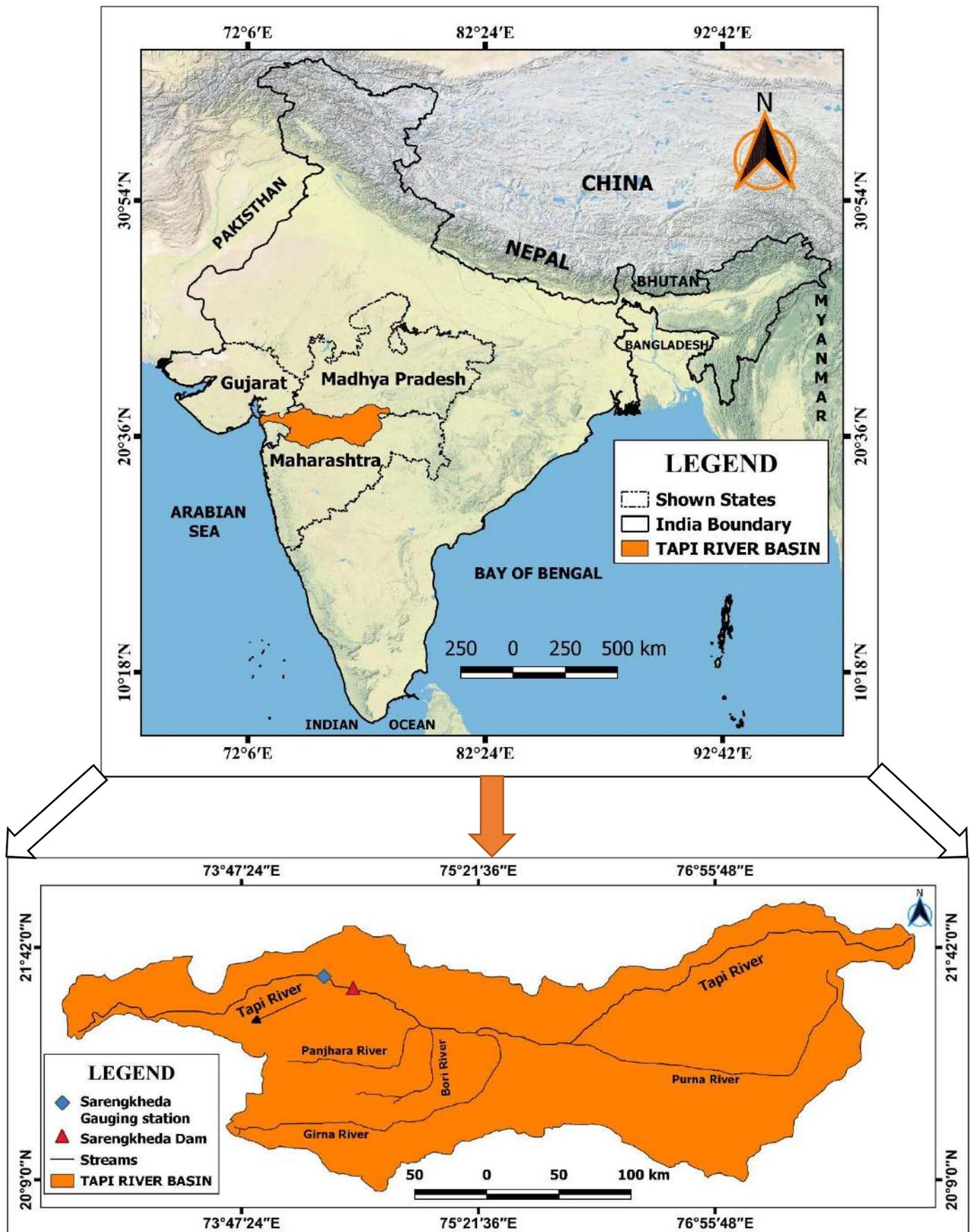


Figure: 1. Map of the study area to showing the location of Sarengkheda gauging station and Sarengkheda Dam for analysing the impact of dam on Tapi River Downstream.

2.1 Location:

The location of study area (sarengkheda dam to sarengkheda gauging station) is 21°25'58" north latitude to 21°25'45" north latitude and 74°27'16" east longitude to 74°31'55" east longitude. It is located on Tapi River basin in Nandurbar district of Maharashtra in India.

2.2 Climate and Rainfall:

The climate in the Nandurbar district as well as the study area is generally warm and dry. There are three distinct seasons which are summer, monsoon and winter seasons. Summer is between March and mid-June and it is finalized in May. Summers are usually hot and dry. Temperatures at the peak of summer can be as high as 45 degrees Celsius. Rainfall begins in mid or late June. The weather this season is usually humid and hot. Northern and western regions of Nandurbar district receive more rainfall than other regions with an average rainfall of 767 mm through the receive Nandurbar district. Winter extends from November to February. And the Average temperature in winter is 15 degree Celsius. Mild cold in winter but dry.

Table no. 6: Climate data of Nandurbar district (Data Source: maharashtra.gov.in. Retrieved on 20th November 2010)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average max Temperature (°C)	25	27	36	42	43	35	28	27	30	31	28	25	31
Average min Temperature (°C)	11	13	18	22	25	25	23	22	21	19	15	12	19
average rainfall (mm)	7	1.18	1.4	1.79	9.2	109	374	135	123	40.4	16.4	3.49	820.7

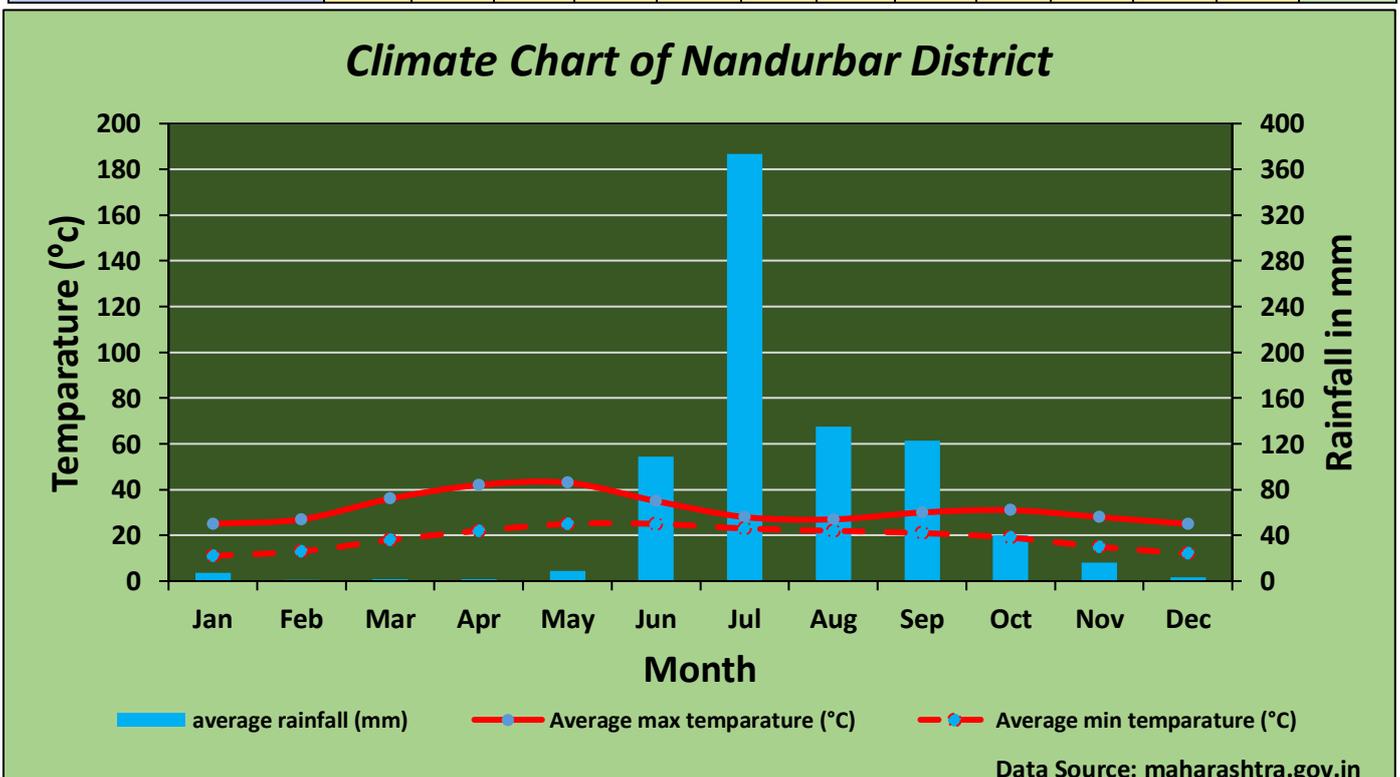


Figure no. 2. Climate chart of Nandurbar district for showing the relationship between average distribution of rainfall (mm) and temperature (°C).

2.3 physiography:

The study area is a part of Tapi river basin. This region consists of black cotton and clay soils in the Tapi river basin. Its water holding capacity is quite good. Some parts of Nandurbar tehsil are covered in this area. Minerals of economic value are not found in the districts as well as in the fields of study. Mud, sand and metallic stones are found here. The total length and geographical area of the study area is 8.5 km and 4.14 sq. km. respectively.

2.4 Criteria for site selection:

Dams are said to be an important source of water supply and for various other reasons. They supply water in a variety of ways for domestic use, irrigation purposes and industrial use. Dams are involved in hydropower generation and river navigation. Despite the many advantages of dams, there are some disadvantages. So the criteria for selection of this site are to understand the dam affects the downstream of the river. To measurement of the discharge of water, sediment concentration and elevation of the downstream and also analyse of geomorphic change of the downstream in pre dam and post dam situation. Here, The Sarengkheda dam in Nandurbar district of Maharashtra which is located on the Tapi River has been chosen.

CHAPTER 3

3. RESULT AND DISCUSSION:

3.1 Possible Effects of the Sarengkheda Dam on the Tapi River Downstream Discharge:

Water discharge is an important hydrological parameter because it determines the shape, size and direction of flow. As the rain begins to get heavier, the soil may become saturated, thus increasing surface flow. As a result, water started flowing in the river. Water discharge is the amount of water that exceeds the cross-section of a current over a period of time. Water discharge is generally measured in cubic meters per second (m³/s). A number of papers in recent years (for example, Lauterbach and Leder, 1969; Moore, 1969; Huggins and Griek, 1974; DeCoursey, 1975; Petts and Lewin, 1979; and Schoof et al., 1980) have discussed the impact of dams on downstream flows. Because of the varied purposes that dams constructed, there are large variations from one dam to a different another within the magnitude and duration of flow releases. Dams are often built along a river to control the amount of discharge. The water is trapped by the dam and released in a controlled manner. It controls floods. Water is generally stored in a reservoir behind the dam. Dam affect the Annual flow volume, Average ten daily peak discharge, Total and mean non-monsoonal discharge, mean daily discharge, mean daily gauge height and flood magnitude.

3.1.1 Changes in Annual flow volume and its impact on sarengkheda dam:

The annual flow volume in the downstream of river affects by dam. In the Tapi River downstream, the annual flow volume are mostly affected by the construction of sarengkheda dam. The table no.2 and the diagram (figure no. 3) below shows that there in tapi river downstream , the annual flow volume decrease after the construction of sarengkheda dam.

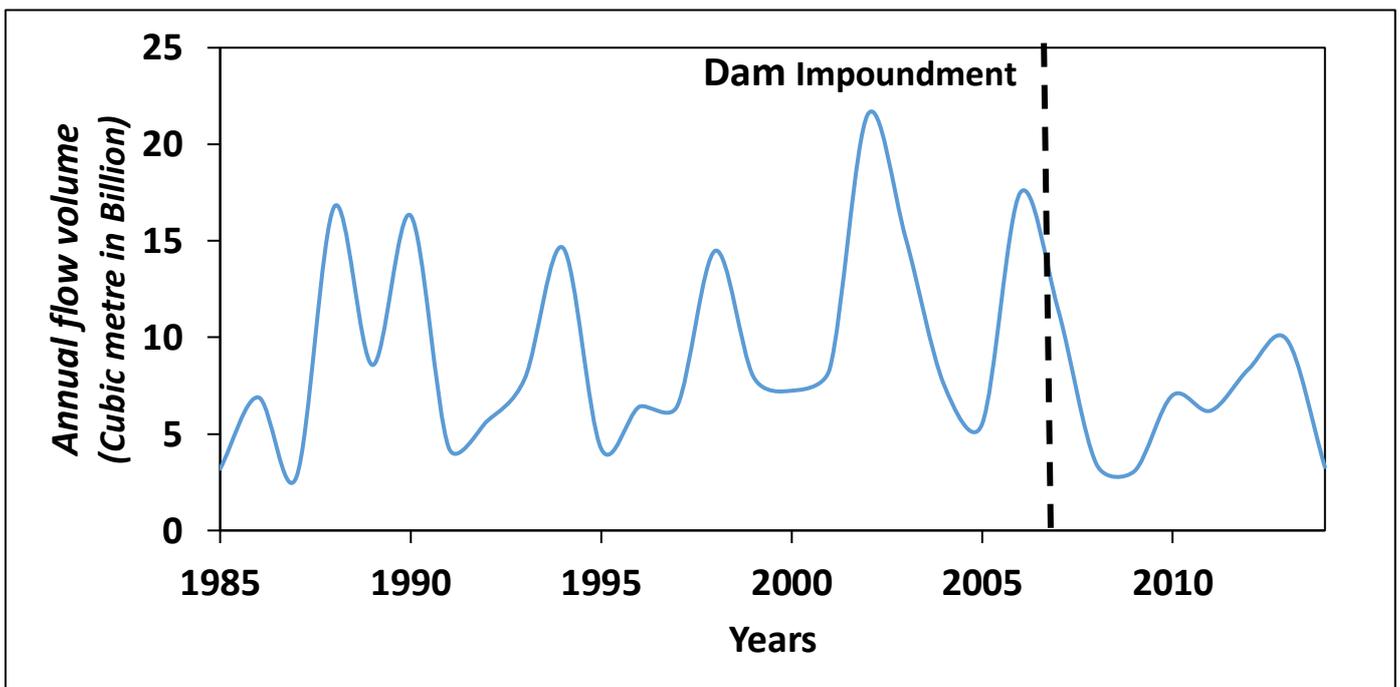


Figure no. 3: Annual flow volume (cubic metre in billion) at sarengkheda gauging station from 1985 to 2014

It can be seen here that where the annual flow volume was 3.19 cubic meter per billion in 1985, it increased to 14.48 in 1998, and then 15.10 cubic meter per billion in 2003 and the year before the dam construction the annual flow volume was 18.48 cubic meter per billion in 2006, But in the year following the dam impoundment (2007), the annual flow volume decreased to 3.44 in 2008 and according to the data obtained from Last CWC, the annual flow volume in 2014 was 3.27 cubic meters in billion.

So, the impact of sarengkheda dam construction falls on the annual flow volume of the study area or selected Tapi River downstream. It is clear from the diagram (figure no.4) that before the dam construction the average annual flow volume was 11.82 cubic metre in billion but after the dam impoundment it decreased to 5.89 cubic metre in billion.

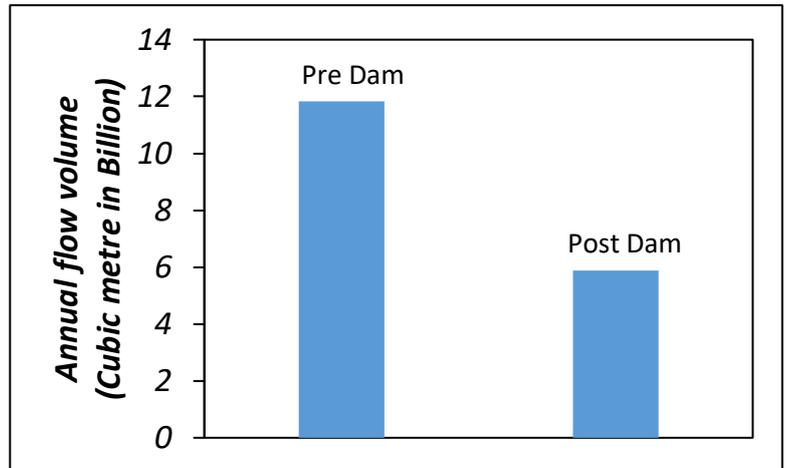


Figure no. 4: Impact of sarengkheda dam on annual flow volume (cubic metre in billion)

3.1.2: Changes in Average Ten daily peak discharge and its impact on sarengkheda dam:

For the construction of sarengkheda dam, the ten daily peak discharge has been changed in the Tapi River downstream. In the study area or selected Tapi River downstream, the average ten daily peak discharge are mostly affected by the construction of sarengkheda dam. The table no 4 and diagram (figure no. 5) below shows that there in tapi river downstream , the average ten daily peak discharge decrease after the construction of sarengkheda dam.

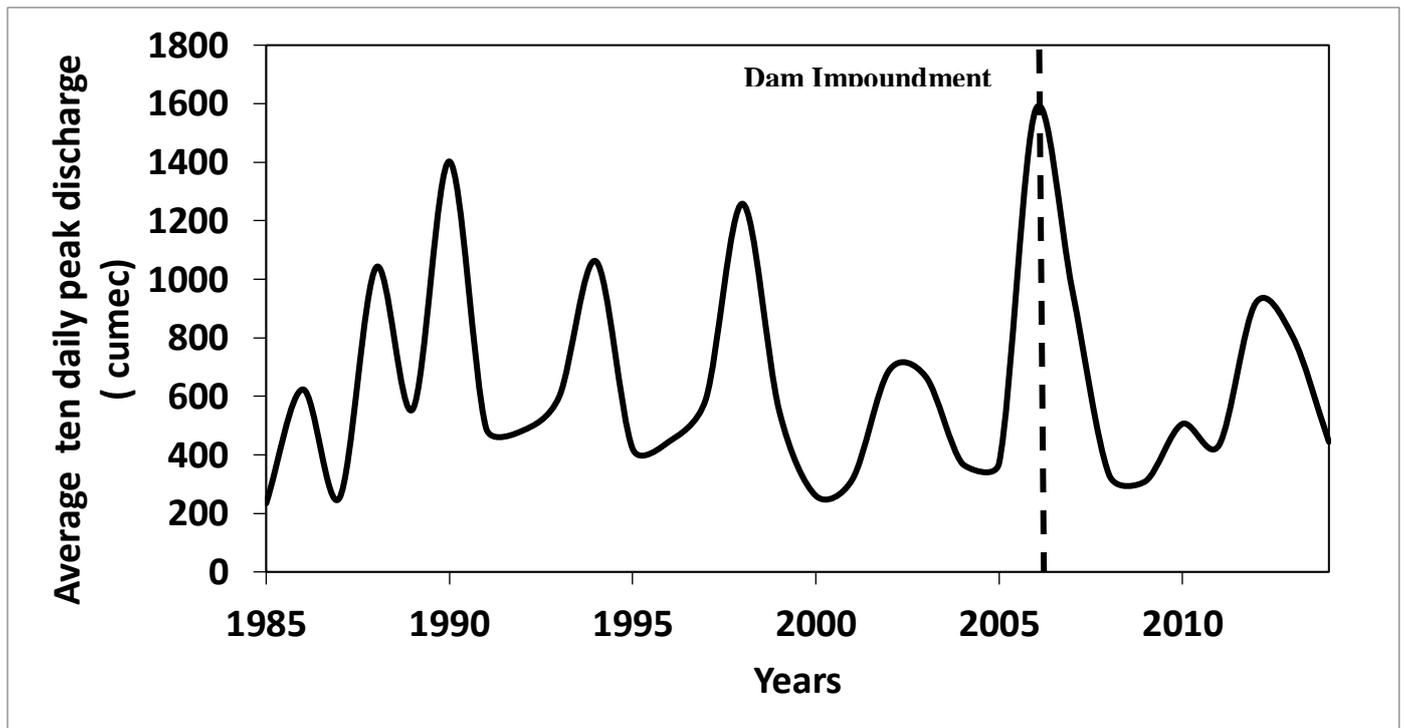


Figure no. 5: Average Ten Daily peak Discharge (Cumecc) from 1985 to 2014

It can be seen here that where the average ten daily peak discharge was 234.244 (Cumec) in 1985, it increased to 14402.61(Cumec) in 1990, and then 1258.12 (Cumec) in 1998 and the year before the dam construction the average ten daily peak discharge was 1580.52 (Cumec) in 2006, But in the year following the dam impoundment (2007), the average ten daily peak discharge decreased to 332.15 (Cumec) in 2008 and according to the data obtained from Last CWC, the average ten daily peak discharge was slightly increased to 444.5583 (Cumec) in 2014.

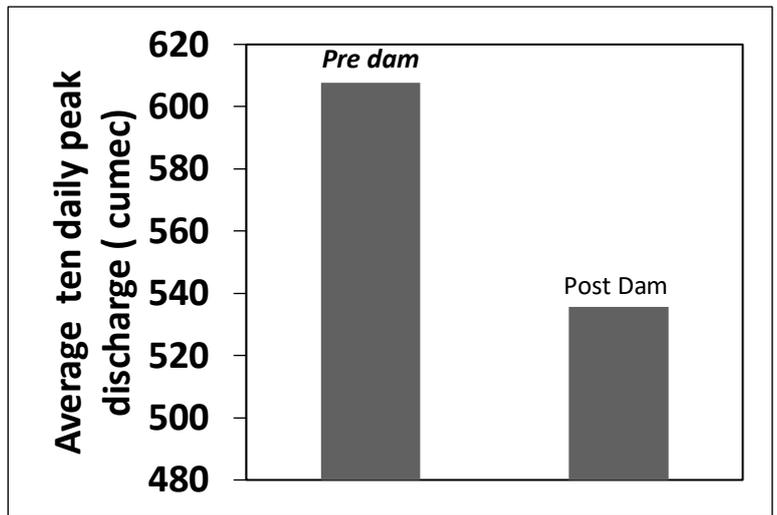


Figure no. 6: Impact of dam on average ten daily peak discharge (Cumec)

So, the impact of sarengkheda dam construction falls on the average ten daily peak discharge of the study area or selected Tapi River downstream. It is clear from the diagram (figure no.6) that before the dam construction the average annual flow volume was 606.67 (Cumec) but after the dam impoundment it decreased to 535.76 (Cumec).

3.1.3: Total non-monsoon discharge (Cumec) and Mean non monsoon discharge (cumec) on pre Dam and post Dam situation:

Southwest monsoon, mostly in June, July, August and September, Influential sources of Annual flow of water in the river Tapi. So the annual flow pattern of the river Tapi is closely connected to Monsoon seasons. These observations are can be noticed other rivers in India such as the Ganges, Brahmaputra, Narmada, Krishna, Kaveri, Godavari and Mahanadi (Subram Nyan 1993). Discharge varies during the rainy seasons, Basins account for 48 to 78% of the total annual flow at its various locations. The annual water flow is responsible for most of the monsoon season; however, there is also enough non-monsoon season to flow in some places. This may be due to the addition of groundwater to the river during the non-rainy season.

The hydrological characteristics of selected Tapi River downstream, computed on the basis of total non-monsoonal discharge and arithmetic mean or average non monsoonal discharge of 29 years of annual discharge data (1985–2014) which collected from Central water commission, India, Flow of water in the river decreases in downstream due to the impoundment of sarengkheda dam in the non-monsoonal seasons. Sarengkheda dams behind reservoir water used for irrigation purpose of the Nandurbar and dhule district of Maharashtra.

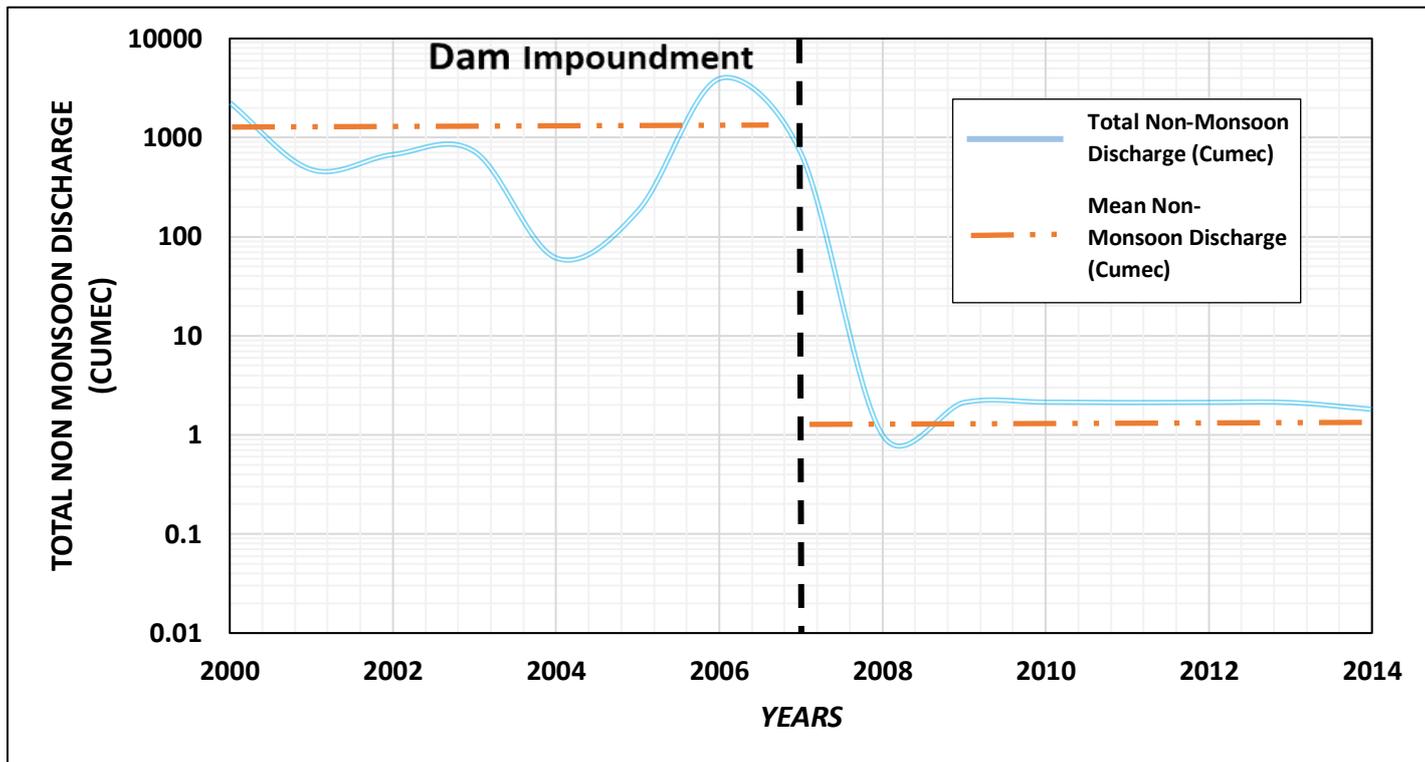


Figure no. 7: Total non-monsoon discharge (CumeC) from 1985 to 2014 and Mean non monsoon discharge (cumeC) on pre Dam and post Dam

Here, figure no 7, shows that the Total non monsoon discharge was 1284.6 (CumeC) in 1985, it increased to 4526.774 (CumeC) in 1990, and then 2257.541 (CumeC) in 2000 and the year before the dam construction the Total non monsoon discharge was 3930.406 (CumeC) in 2006, But in the year following the dam impoundment (2007), the total non monsoon discharge decreased to 1 (CumeC) in 2008 and according to the data obtained from Last CWC, the average ten daily peak discharge was slightly increased to 1.81 (CumeC) in 2014.

Table no. 7: Mean non-monsoon discharge (CumeC):

Mean non-monsoon discharge(CumeC)	
pre dam	1186.24
post dam	1.92

So, the impact of sarengkheda dam construction falls on the Total non monsoon

discharge of the study area or selected Tapi River downstream. It is clear from the table no 7 and diagram (figure no.6) that before the dam construction the average annual flow volume was 606.67 (CumeC) but after the dam impoundment it decreased to 535.76 (CumeC).

3.1.4 changes in Maximum gauge height and its impact on flood magnitude in downstream for sarengkheda dam:

Flood magnitude, a measure of how severe a flood is, strictly a hydrological event. The hydrological characteristics of selected Tapi River downstream, computed arithmetic Maximum gauge height of 29 years on the basis of annual gauge height data (1985–2014) which collected from Central water commission, India, maximum gauge height of water in the selected Tapi river, changes in downstream due to the impoundment of sarengkheda dam.

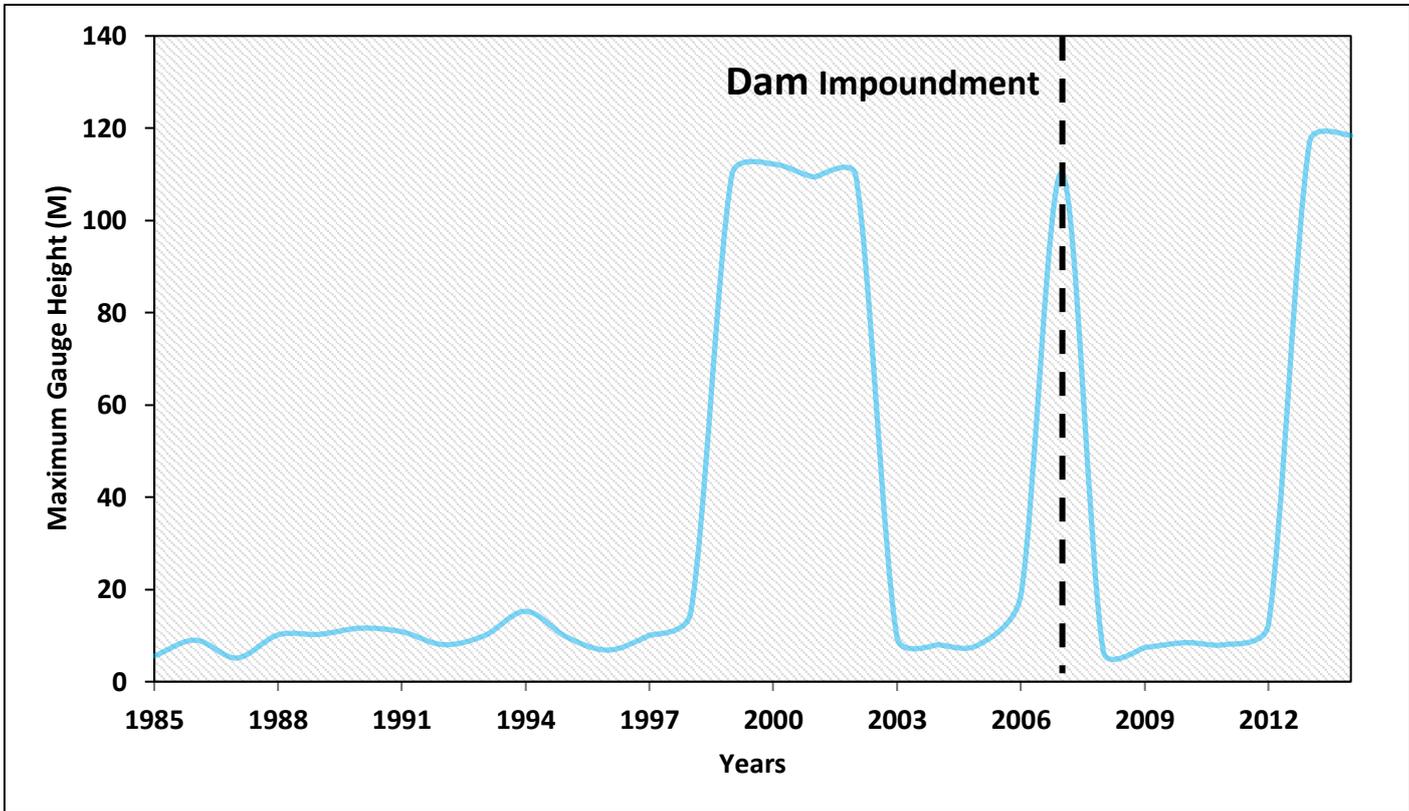


Figure no 8: Maximum gauge height (M) showing the flood magnitude from 1985 to 2014

Here, figure no 8, shows that the Maximum gauge height was 5.57 (m) in 1985, it increased to 11.6 (m) in 1990, and then 112.2 (m) in 2000 due to heavy rainfall in monsoon season and this year was flooded and the year before the dam construction the Maximum gauge height was 18.7 (m) in 2006, But in the year following the dam Impoundment (2007), the Maximum gauge height decreased to 6.6 (m) in 2008 and according to the data obtained from Last CWC, the Maximum gauge height was increased to 118.4 (m) in 2014 due to heavy monsoonal rainfall.

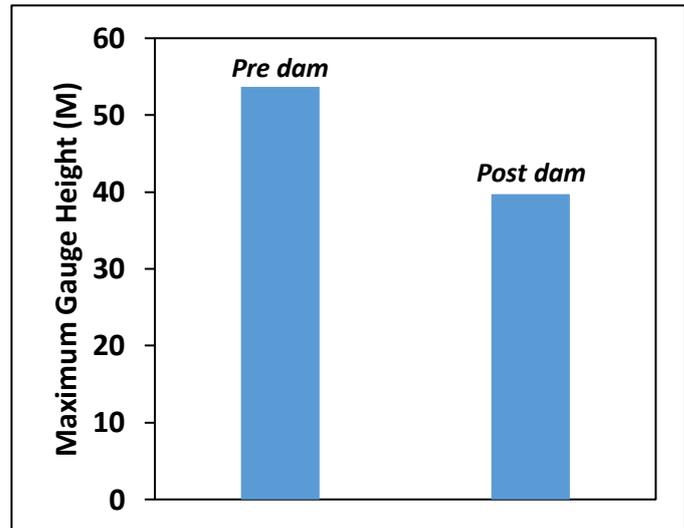


Figure no. 9: Impact of dam on maximum gauge height (M)

So, the impact of sarengkheda dam construction falls on the Maximum gauge height of the study area or selected Tapi River downstream. It is clear from the diagram (figure no.9) that before the dam construction the average Maximum gauge height was 53.67 (m) but after the dam impoundment it decreased to 39.75 (m).

3.1.5 Relationship between mean daily discharge and mean daily gauge height on pre

Dam and post dam situation:

To understand the effects of sarengkheda dam, here shows the relationship between mean daily discharge and mean daily gauge height on pre dam and post dam situation. In the figure no 10 and 11 shows that mean daily

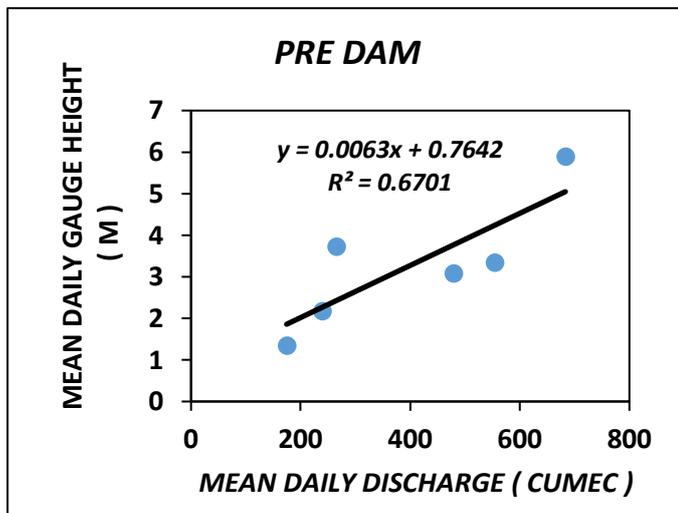


Figure no 10: Scatter plot showing the relationship between mean daily discharge (Cumec) and mean daily gauge height (M) on pre Dam

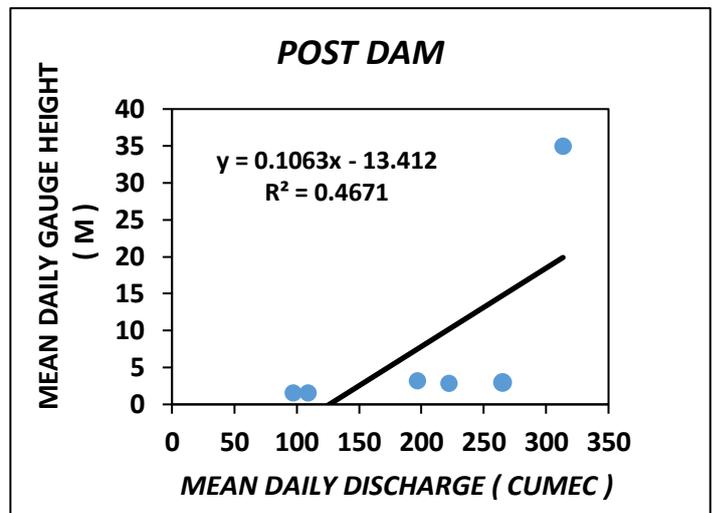


Figure no 11: Scatter plot showing the relationship between mean daily discharge (Cumec) and mean daily gauge height (M) on post Dam

Discharge (Cumec) and mean daily gauge height (m) are high in pre dam condition and there is a positive relationship because when the mean daily discharge is increase then the mean daily gauge height also be increased. Mean daily Discharge (Cumec) and mean daily gauge height (m) are low in post dam condition and there is a positive relationship because when the mean daily discharge is increase then the mean daily gauge height also be increased but the amount of mean daily discharge and mean daily gauge height are lower than pre dam condition. Here noticed that mean daily discharge is low but when water is being released from sarengkheda dam, a huge amount of water is being released like in 2014 the mean daily discharge is 313.47 cusec but the mean gauge height is 34.95. So, resulting in increase in gauge height in post dam situation hence the downstream area was flooded. So the impact of sarengkheda dam construction falls on the mean daily discharge but high mean daily gauge height than pre dam of the study area or selected Tapi River downstream.

3.2 Possible Effects of the Sarengkheda Dam on the Tapi River Downstream Sediment Load:

Data about measurement suspension-sediment Loads are available before and after the construction of the sarengkheda dam reaches at sarengkheda gauging station from the central water commission. Similar information has been used in specific cases to show dam-related changes in suspended sediment loads. In addition to changing flow patterns, dams are Effective sediment trap. Compression of sediment can supply as a change in water discharge has a significant impact on downstream channels. With some dams, such as those built primarily for hydropower generation, Sediment can be trapped as a Proportional result of the overall structure of the dam and operation. In other dams, there may be sediment control be a specific purpose or

objective in the construction of the dam. Sediment-transport measurements are usually given as sediment concentrated (weight of sediment per unit volume of water-sediment mixture) or as annual sediment load in tons per years. Here, sarengkheda dam affect the transport of total sediment load in the downstream area.

3.2.1: Changes in Total sediment load and its impact in downstream for Sarengkheda dam:

By trapping sediment in reservoirs, dams impede the continuity of sediment transport through rivers, resulting in depletion of reservoir storage and reduced usable life, and depriving downstream channel flow and sediment flow which essential for aquatic habitat. Initially, sediments are continuously supplied to the river through the process of surface erosion. Reservoir sedimentation is a transparent process as a result of obstructing the natural flow of a river through the construction of a dam. Here sarengkheda dam is store the sediment in reservoir which Tapi river carry, resulting in downstream sediment does not reach much. Figure no 12 shows that the sediment load

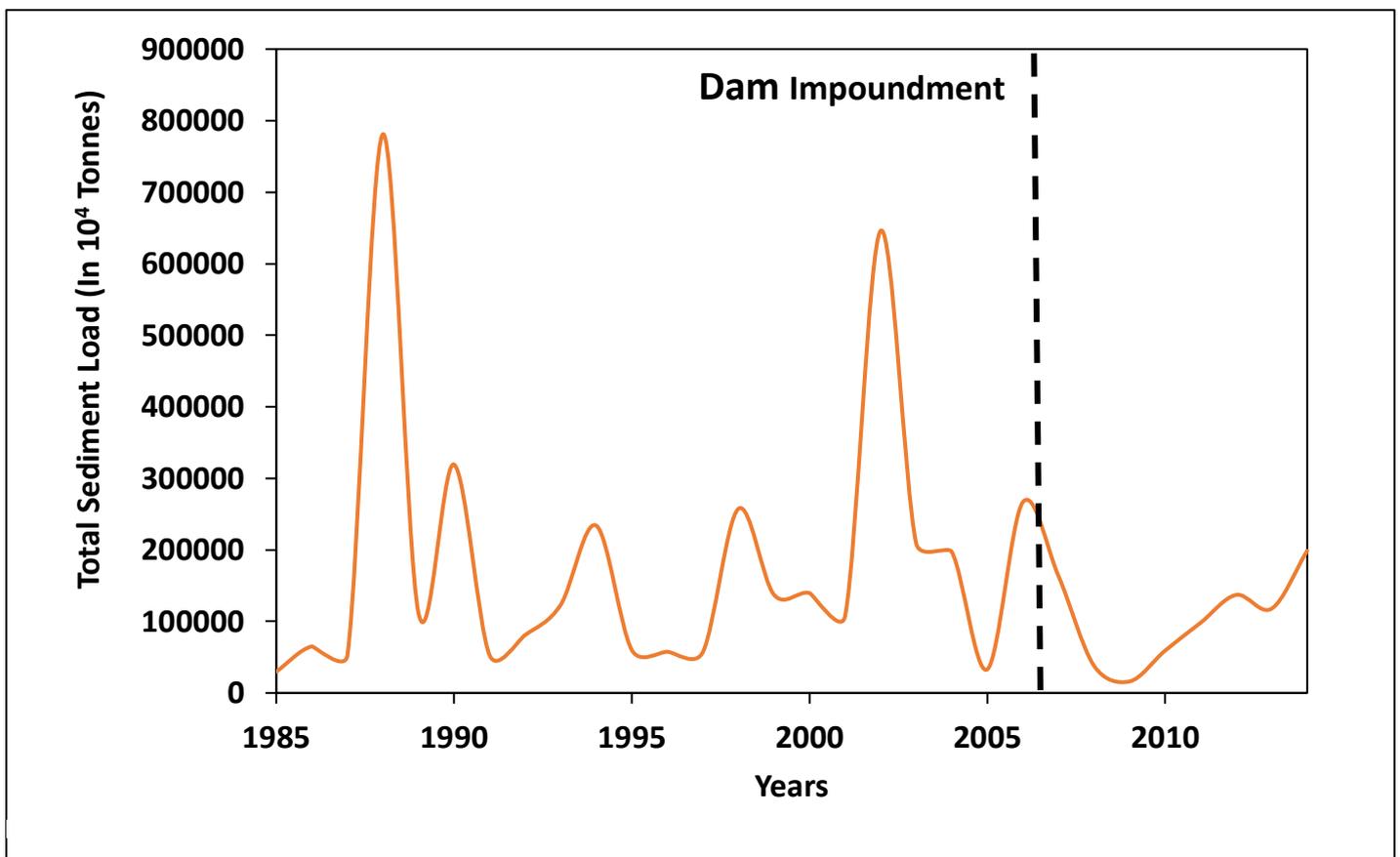


Figure no. 12: Total sediment load (in 10⁴ tonnes) from 1985 to 2014 at Sarengkheda gauging station

was 29773.04 (In 10⁴ Tonnes) in 1985, it increased to 781044.63(In 10⁴ Tonnes) in 1988, and then 645986.05(In 10⁴ Tonnes) in 2002 and the year before the dam construction the total sediment load was 266635.19(In 10⁴ Tonnes) in 2006, But in the year following the dam Impoundment (2007), the total sediment load decreased to 38243.68(In 10⁴ Tonnes) in 2008 and according to the data obtained from Last CWC, the Total sediment load was slightly increased to 198641.48(In 10⁴ Tonnes) in 2014.

So, the impact of sarengkheda dam construction falls on the total sediment load of the study area or selected Tapi River downstream. It is clear from the diagram (figure no.13) that before the dam construction the average total sediment load was 224482.38 (In 10^4 Tonnes) but after the dam impoundment it decreased to 94987.8(In 10^4 Tonnes).Hence, the transport of sediment concentration are decreased due to the sarengkheda dam construction.

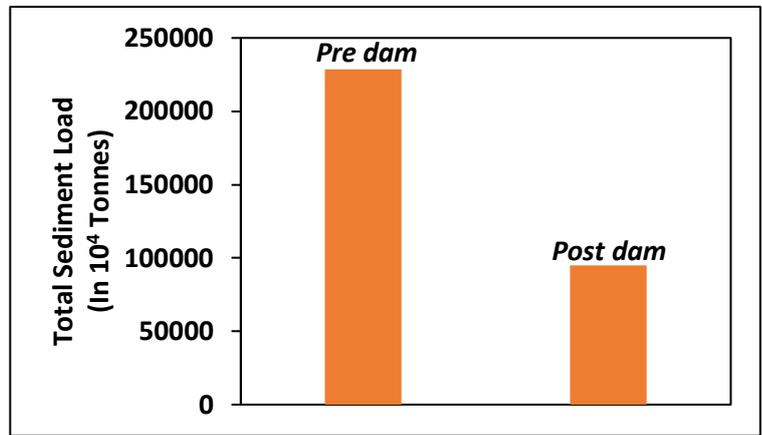


Figure no.13: Impact of dam on Total sediment load (in 10^4 tonnes)

3.2.2 Relationship between annual discharge and annual sediment Load in pre dam and post dam condition:

Sarengkheda Dam traps large proportions of sediments being carried by the Tapi River. The relationship between sub-basin areas with water discharge and sediment load is not linear for all sub basins studied. The number of variables in sediment transport are many and hence in a singular characteristics in controlling

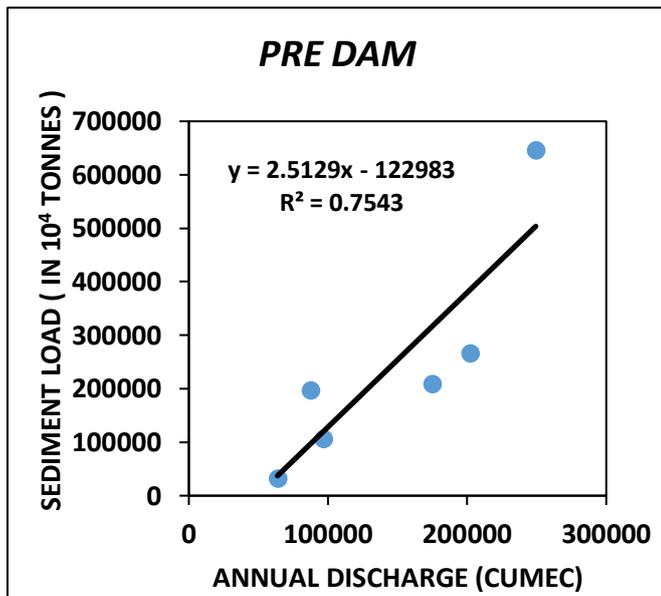


Figure no 14: Scatter plot showing the relationship between annual discharge (CumeC) and annual sediment Load (in 10^4 tonnes) on pre dam

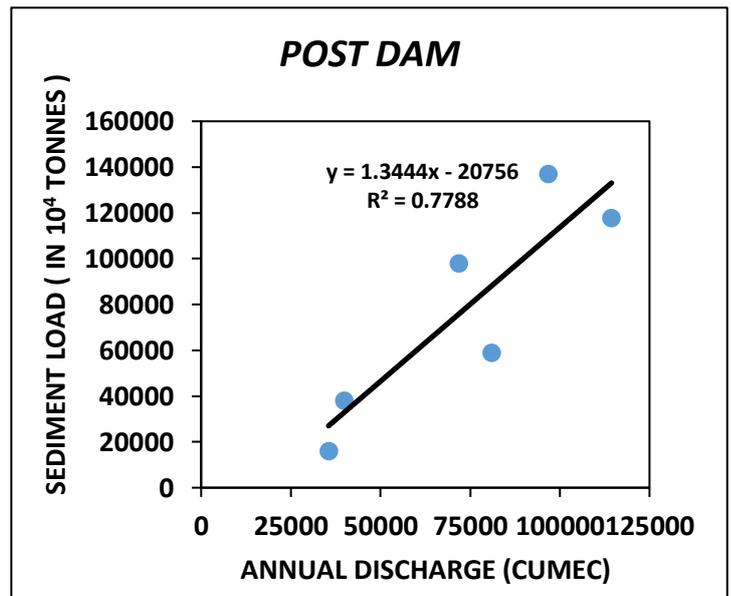


Figure no 15: Scatter plot showing the relationship between annual discharge (CumeC) and annual sediment Load (in 10^4 tonnes) on post Dam

sediment leads are not observed. Figure no 14 and 15 shows that the relationship between annual discharge and sediment load in pre dam and post dam condition of the study area. Here it is seen that the water discharge much higher in pre dam condition than post dam impoundment and at the same time the sediment load was higher e.g. the water discharge was 63710.75(CumeC) and the sediment load was 32890.31 (in 10^4 tonnes) in 2000 and it increased to 249349.75 (CumeC) and 645986.05 (in 10^4 tonnes) respectively in before the dam impoundment year (2006). But the construction of sarengkheda dam the water discharge and sediment load

are decreased e.g. the water discharge was 35538.91(Cumec) and the sediment load was 16038.00 (in 10^4 tonnes) in 2008 or after the dam impoundment year. And according to the last year that is 2014, computed water discharge and sediment load data on the basis of water discharge and suspended sediment concentration data of CWC, the water discharge and sediment load was 114419.51(Cumec) and 117884.26 (in 10^4 tonnes) respectively which is much lower than pre dam condition. So, it can be said that the sarengkheda construction has resulted in a lot of reduction of water discharge and suspended sediment transport in the study area or selected downstream of Tapi River.

3.3 Possible Effects of the Sarengkheda Dam on the Tapi River Downstream Bed Elevation:

Coarse particles at the bottom of several rivers flowing from the dam. The results of water discharge, sediment load measurements are used to explain some aspects of channel and bed-material change. Before dam construction the river was in a state of equilibrium characterized by a clear flow water and with suspended matter. As the water stores behind a constructed dam, it loses most of the material suspended in it. The increased water velocity of pure water in front of the dam starts to degrade the bottom and the banks of the downstream river to compensate for the loss of the material deposited in the reservoir. Minor degradation below dams is sometimes desirable and beneficial since it increases channel capacity and improves drainage of adjoining lands. The rate of degradation below reservoirs depends upon the type of material in the channel and the hydraulic characteristics of the outflow. These degradation processes will eventually reduce the water level and increase the hydraulic pressure on the structures located downstream of the dam such as bridges. The present case study for the above mentioned problem was applied to the effect of sarengkheda dam on the degradation of Tapi river bed. The dam was located on Tapi River at near sarengkheda village in Nandurbar district of Maharashtra (Fig 1). The dam construction completed in 2007 and started to store water behind in the beginning of 2007.

3.3.1: Changes in Bed Elevation and its impact in downstream for Sarengkheda dam:

For the construction of sarengkheda dam, the mean bed elevation has been changed in the Tapi River downstream. In the study area or selected Tapi River downstream, the mean bed elevation are mostly affected by the construction of sarengkheda dam. The diagram (figure no. 15) which created on the basis of cwc provided mean bed elevation data, below shows that there in tapi river downstream , the mean bed elevation decrease after the construction of sarengkheda dam. It can be seen here that mean bed elevation was 112.74 meter in 1985, it slightly decreased to 112.34 m in 2002, and then 112.48 meter in 2004 and the year before the dam construction the mean bed elevation was 112.39 meter in 2006, But in the year following the dam impoundment (2007), the mean bed elevation decreased to 111.82 m in 2008 and according to the data obtained from Last CWC data, the mean bed elevation in 2014 was 111.35. And also it can be seen from the cross profile (figure no 18) of the Tapi river downstream at sarengkheda gauging Station, the bed elevation is slightly decreased due to normal free water flow

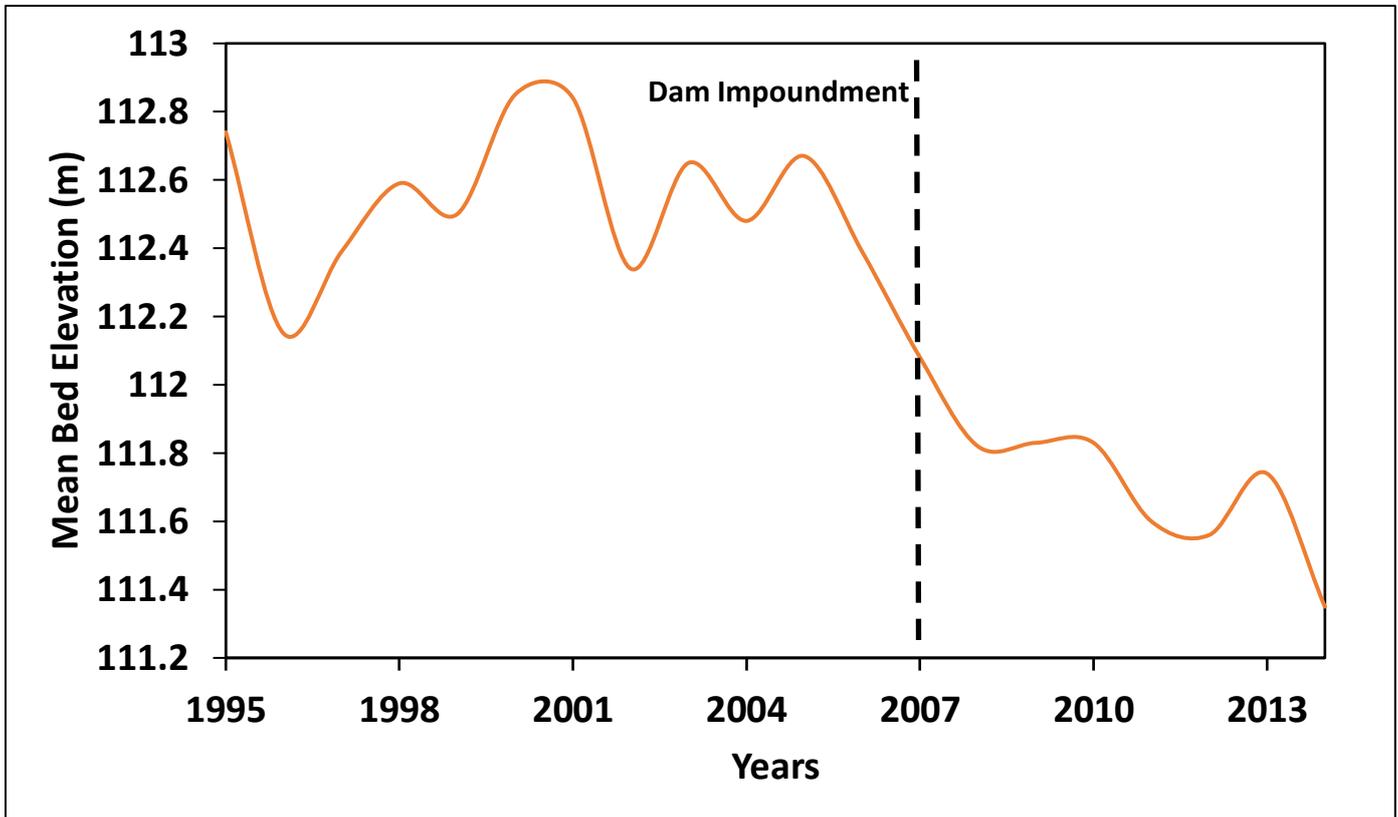


Figure no 16: Mean Bed Elevation (m) from 1995 to 2014 of Tapi River downstream at sarengkheda gauging station.

in 7 years pre dam impoundment (2001). In 2001, it can be seen that the bed elevation at 10 meter distance was 117.53 m, in 100 m distance it was 109.005m, in 200m, 300m and 400m the bed elevation was 110.005m, 111.28

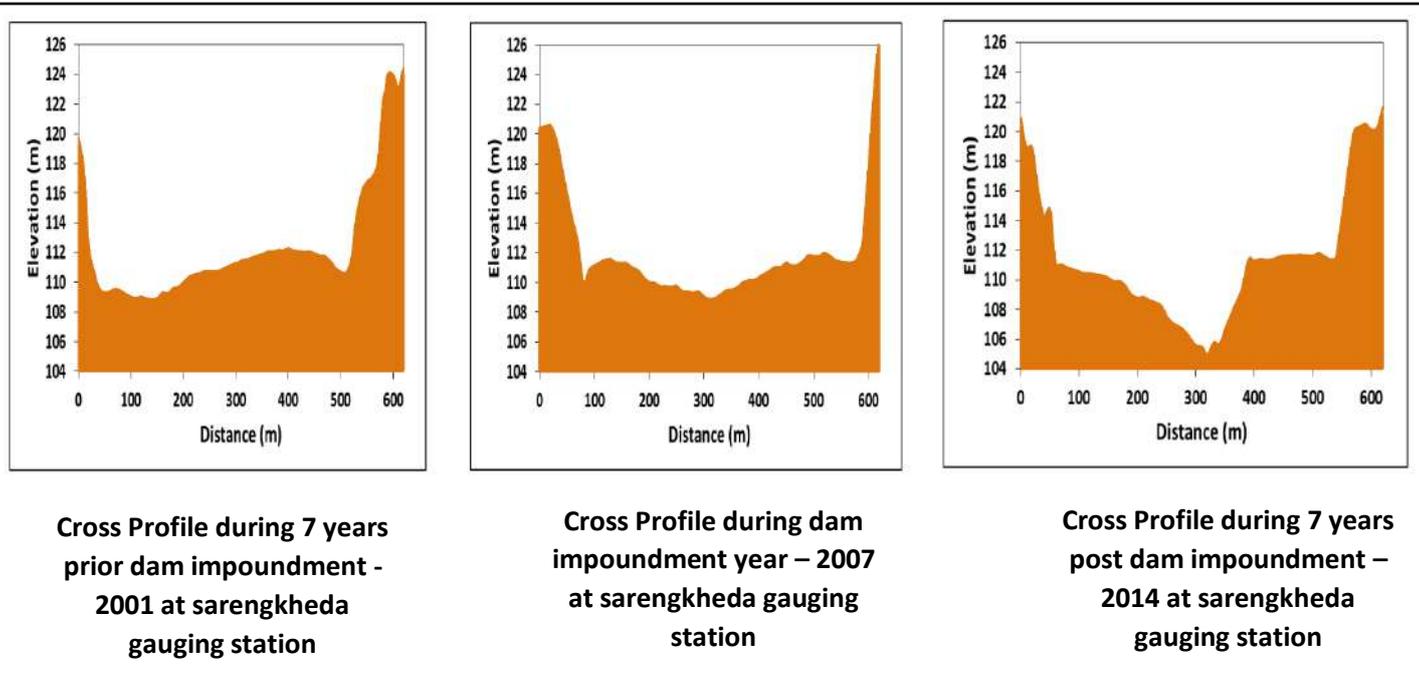


Figure no.17: Cross Profile of 7 years prior dam impoundment (2001), during dam impoundment (2007) and 7 years post dam impoundment (2014) of Tapi River downstream at sarengkheda gauging station.

m, 112.26m respectively. And from the 500 and 600 metre distance it was 110.69m and 123.95 m respectively. During the dam impoundment year (2007), the bed elevation was starting decreased due to suspended sediment concentration and water trapped by the construction of sarengkheda dam. In this dam impoundment year the bed elevation was 111.14 metre in 100 m distance, so it was decreased bed elevation approx. 2 meter than the pre dam impoundment (2001).and it was 110.03m,109.005m,111.755m and 117.68m from the distance in 200m,300m,500m,and 600 meter respectively. But after the 7 years of post-dam impoundment the bed elevation was more decreased by the base level of erosion that means the minimum amount of river water and sediment that flowed downstream of the Tapi river after the sarengkheda dam were constructed, that caused more river bed erosion and or more bed degradation.it can be seen that in post dam condition (2014) the river bed elevation from in 100 m, 200 m, 300 m and 500m distance from sarengkheda gauging station along the river cross profile was 110.575m, 108.775m, 105.475 and 111.6m respectively. The lowest bed elevation is 105.475 m along the cross profile of the river, 310m distance from the sarengkheda gauging station.

So, the impact of sarengkheda dam construction falls on the mean Bed Elevation of the study area or selected Tapi River downstream. It is clear from the diagram

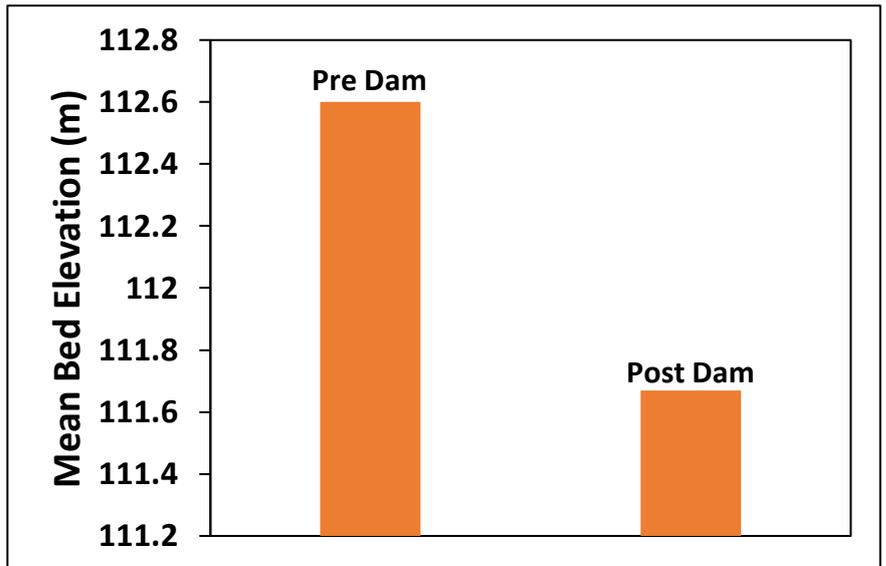


Figure no 18: Impact on dam on Mean Bed elevation (m) of Tapi River downstream at sarengkheda gauging station

(figure no.19) that before the dam construction the average mean Bed Elevation was 112.6m but after the dam impoundment it decreased to 111.67 metre and hence, it increased to bed degradation. In this case the

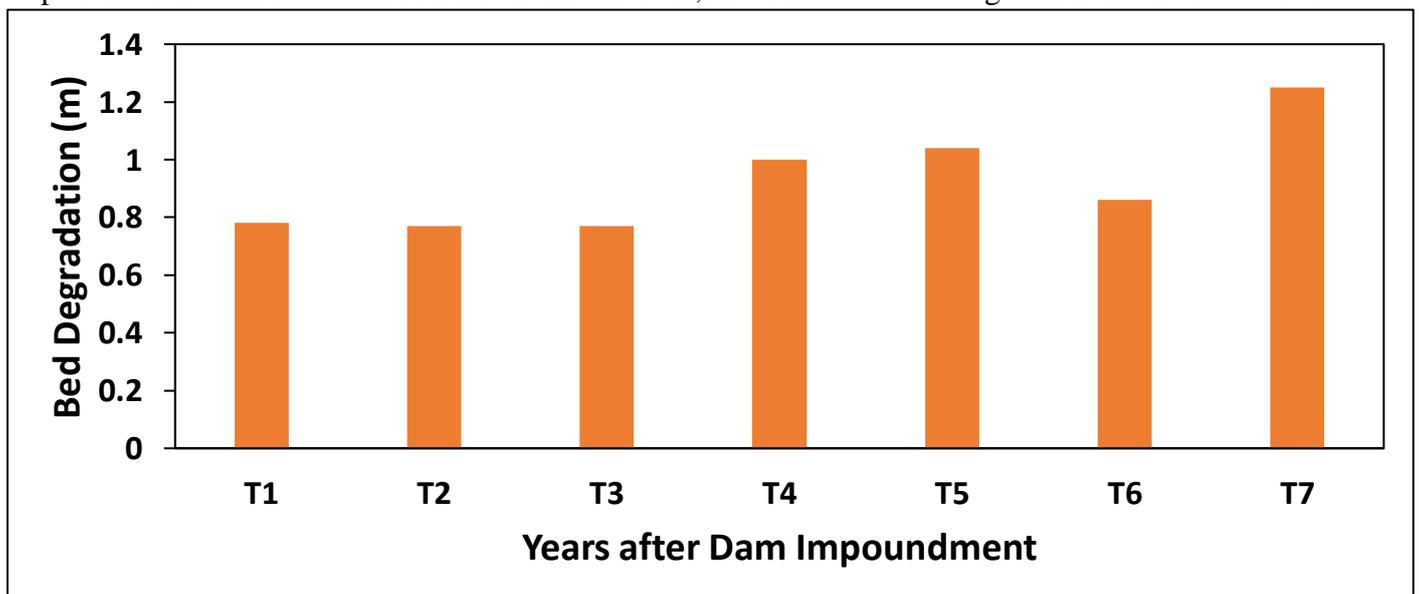
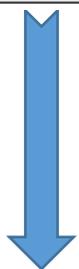
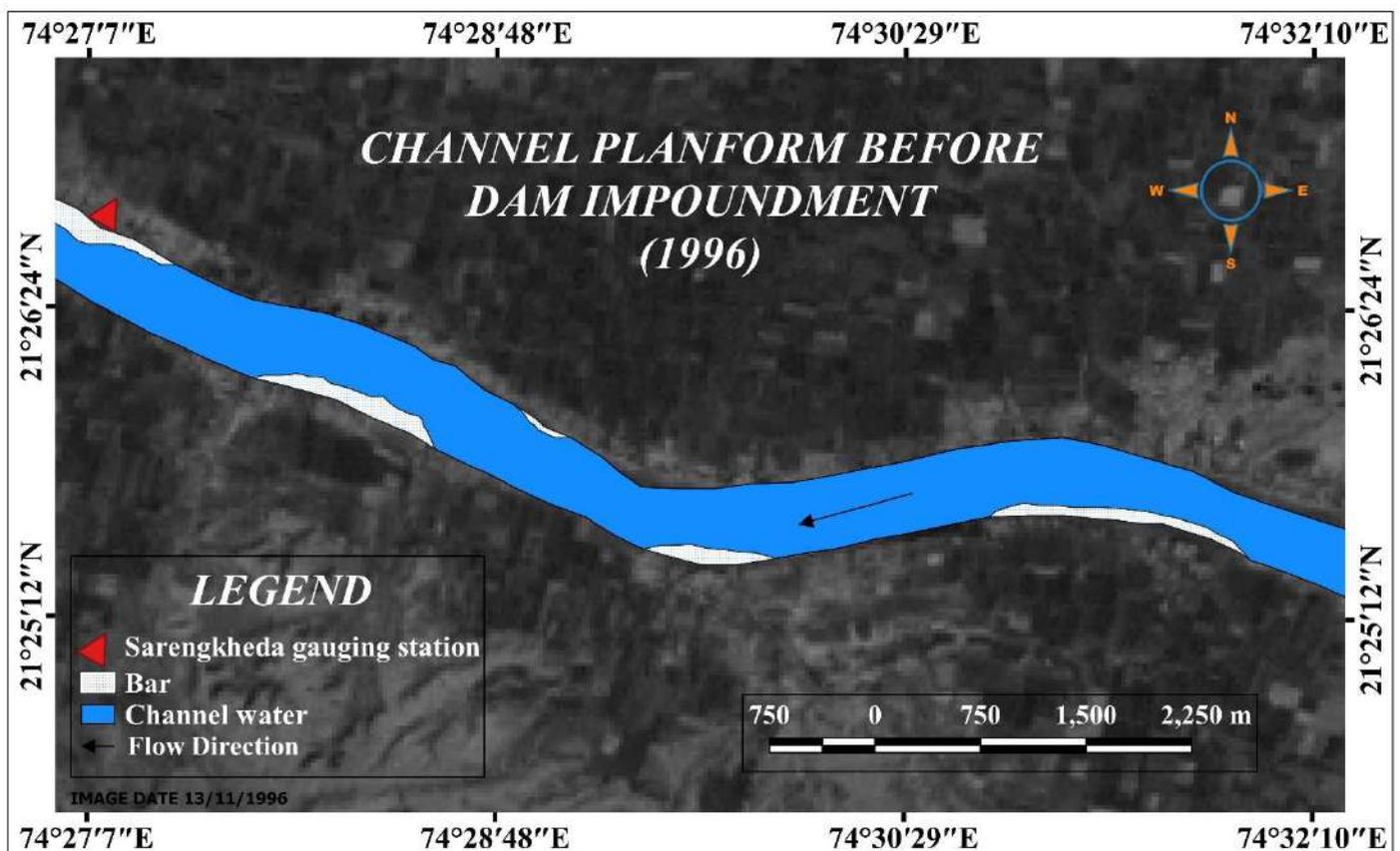


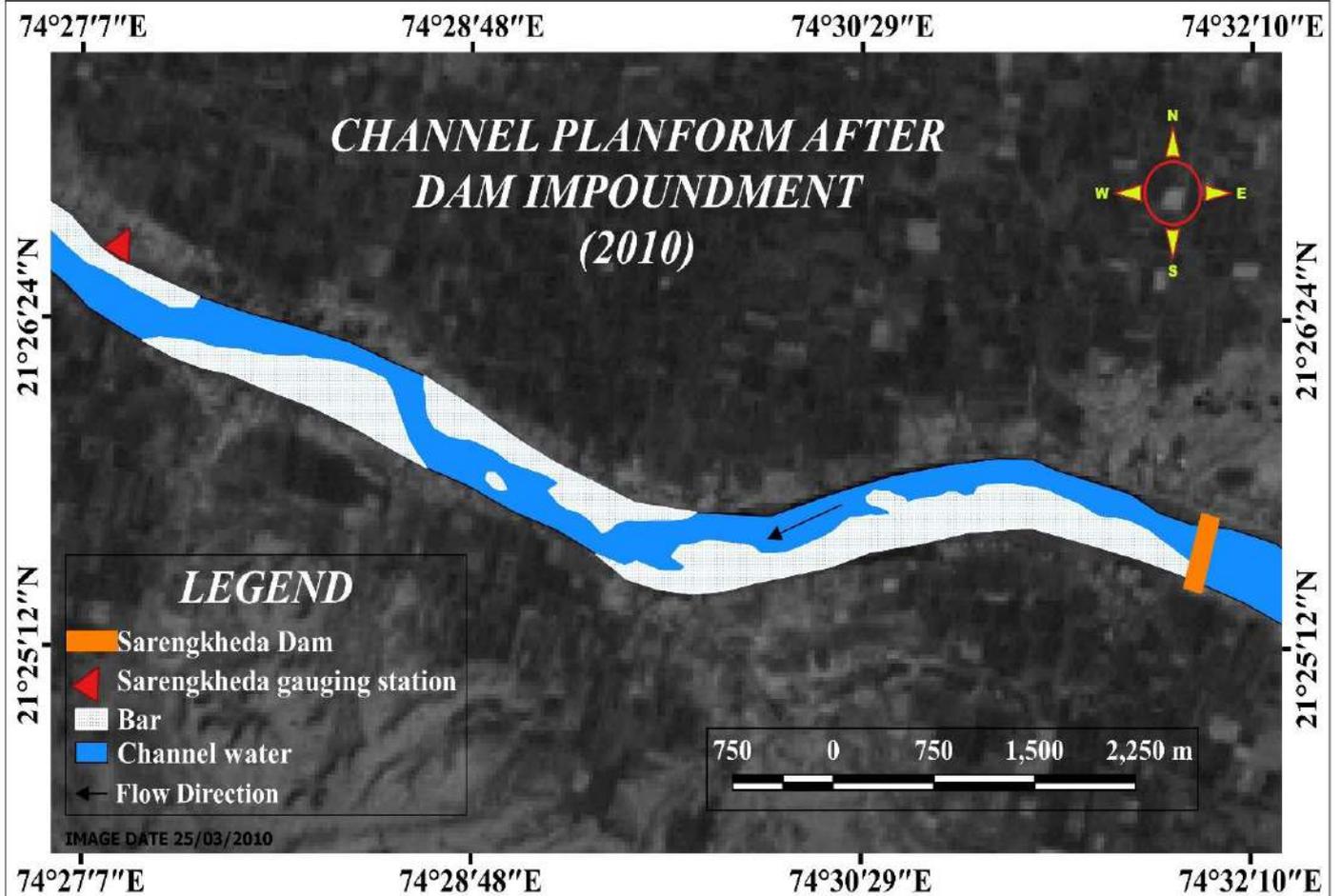
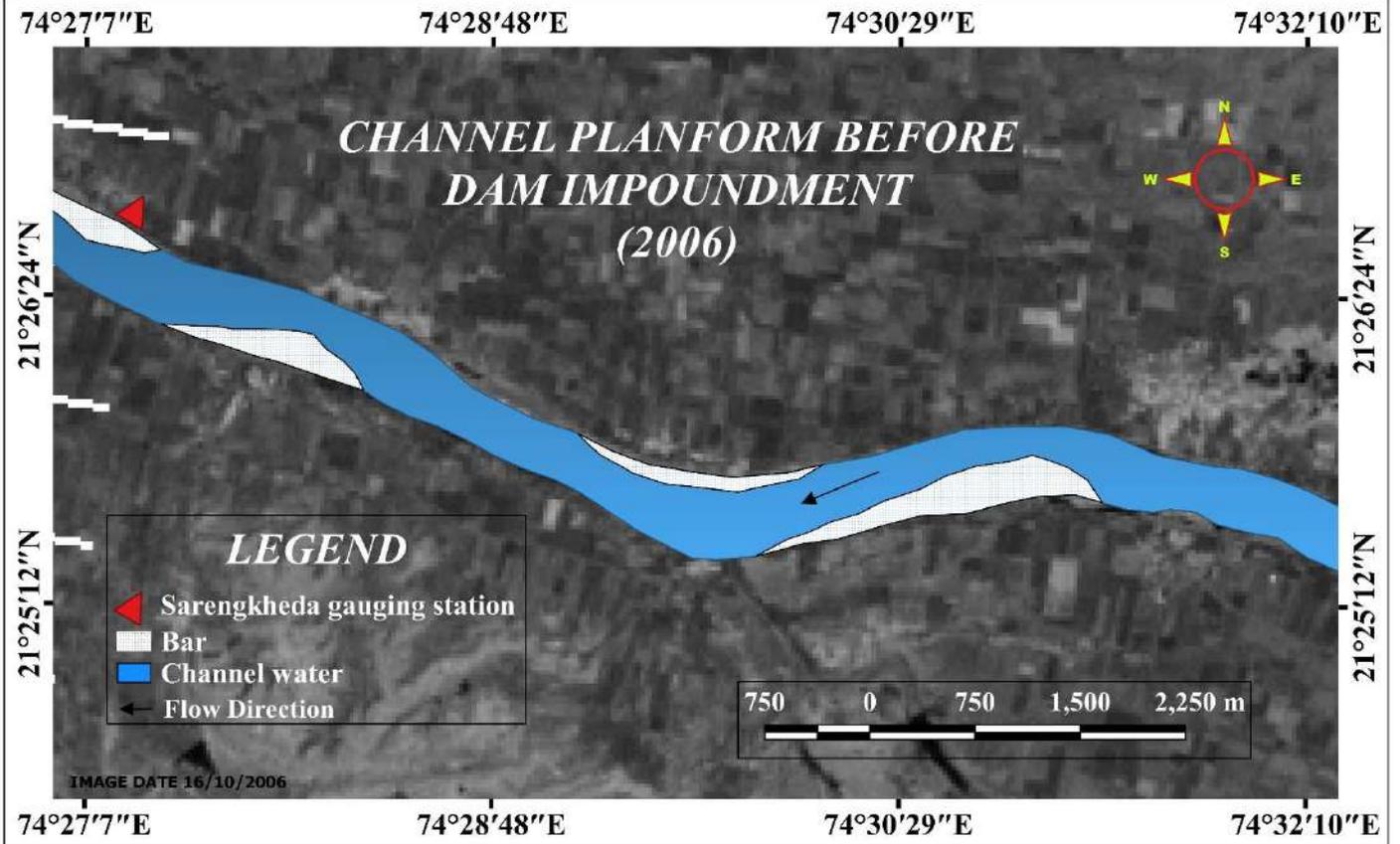
Figure no 19: Bed degradation (m) on years after dam impoundment

diagram (figure no.20) above shows the first Year (T1) after the construction of the sarengkheda dam, the selected downstream river's bed degradation was 0.78 metre, it increased to 1 metre in 4th year (T4) and 1.04 metre in 5th year (T5) after the dam construction. The last year (T7) calculated average mean bed elevation data on the basis of CWC bed elevation data, the bed degradation is 1.25 metre. Thus it can be noticed that construction of sarengkheda dam has reduced the bed elevation as well as increased the bed erosion or bed degradation of the selected downstream of Tapi river.

3.4 Possible Effects of the Sarengkheda Dam on the Tapi River Downstream channel planform:

A river planform reflects the semi-equilibrium form of a channel in response to energy concentration or dissipation and associated water transfer and sedimentation. The channel planform reflects the combination of macro-scale dimensional units from meso in the active channel. Here analyses the impact on sarengkheda dam on Tapi River's downstream channel planform like changes of channel width, water surface area, bar area etc. for construction of sarengkheda dam. Four Landsat satellite images have been downloaded from earth explorer website and further proceed by QGIS software to analyse the channel platform of the Tapi River downstream. The four images (1996, 2006, 2010 and 2019) are shown below





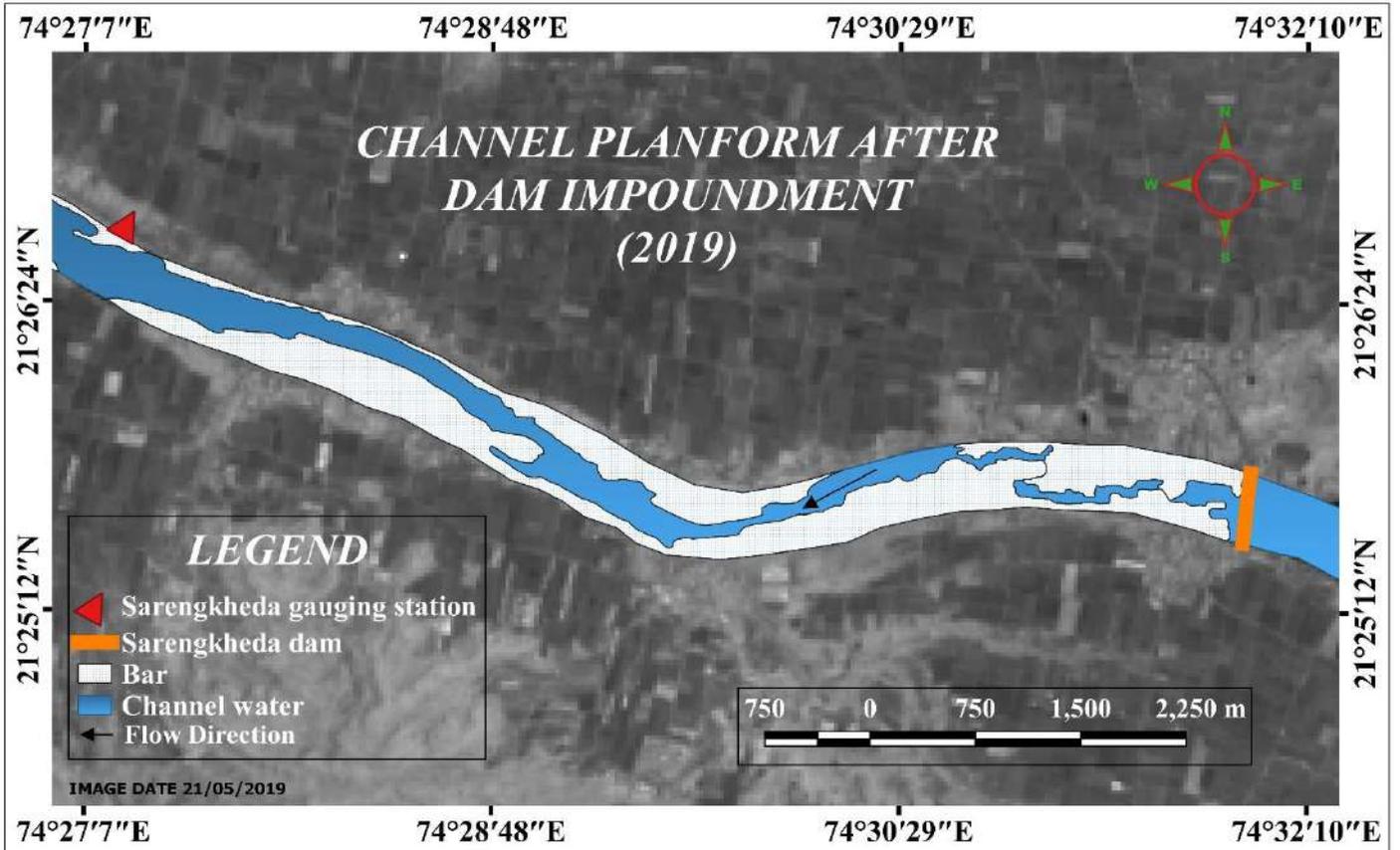


Figure no.20: Channel Planform in pre dam and post dam period (from 1996 to 2019) of the selected Tapi River downstream for analysing sarengkheda dam impact on the downstream.

Here, (The figure no. 21) selected study area's 4 Landsat satellite images downloaded from Earth Explorer website and processed them through the QGIS application to show how the sarengkheda dam affected the selected downstream (sarengkheda dam to sarengkheda gauging station) of the Tapi river. In this figure, two Landsat images (1996 and 2006) are shown before the dam impoundment and two images (2010 and 2019) after the dam impoundment period.

Looking at the image of 1996 which is before the dam were constructed, it is clear that before the dam was built, the flow of river water was normal and the river had low bank erosion capacity was very low. With it the Bar formation of river was very minute. Then in 2006 the riverbank erosion capacity increased slightly and also the Bar formation slightly increased. The flow of water was almost normal in this time. The water surface area decreased slightly than 1996. Since the construction of the dam in 2007, Landsat satellite images from 2010 have shown that river Bar formation has increased significantly, as has the ability to erode river banks for construction of sarengkheda dam. Then the recent year i.e. the 2019 Landsat satellite image showed

that the river Bar formation had increased very significantly and the river downstream water flow almost block for Bar formation in the post monsoonal season and the river bank erosion was increased.

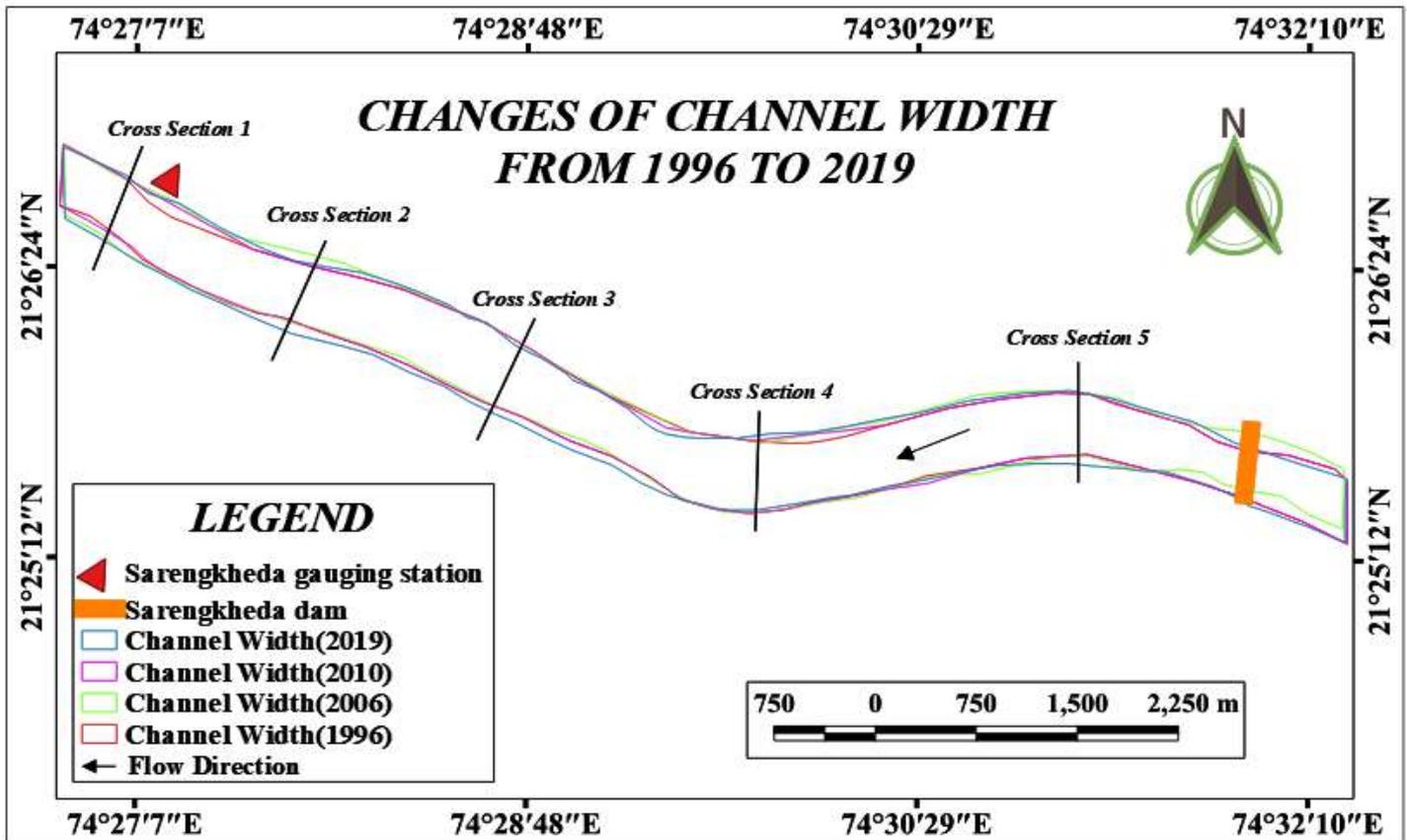


Figure no. 21: changes of channel width from 1996 to 2019 in pre dam and post dam condition.

In the above figure (figure no. 22) shows the cross sections of the selected Tapi River downstream to show how much the river width has increased or decreased in different years. A total of five cross section lines have been drawn here. The Lancet satellite images of the different years were downloaded from earth explorer and then digitised selected study reach by QGIS and then in cross sections wise river width measured a measurement scale of QGIS. After measuring according to the cross section, it was found that the river width has increased since the dam impoundment as compared to the pre dam improvement. According to table number 13 in 1996, 1st cross section wise river width was 398.206 meters then in 2006 it slightly increased to 450.254m and in 2010 it was 420.823m and recent in 2019, it has been 495.352m. Similarly, before the dam impoundment cross section 2 wise channel width was 450.254 meters in 1996, it has increased to 547.32 meters in 2019. And cross section 3, 4 and cross section 5 in 1996, the channel width was 509.056m, 543.108m and 463.205m respectively, and it was in 2006 has been slightly increased to 510.256m, 550.368m, 482.326m respectively and 2010 i.e. after three years of sarengkheda dam impoundment (sarengkheda dam constructed in 2007), it has been 540.321m, 562.887m, 495.325m respectively and in the recent year of 2019 it has been immensely increased to 545.856m, 576.002m, 551.212m respectively.

It is calculated how much the channel width increases in pre dam and post dam period. Calculations have since shown that the Channel width in pre dam condition was normal or very slightly increased per year, but since dam construction it has increased significantly every year. This figure (figure no. 23) shows that the channel width along the cross sections (1,2,3,4,5) in Pre dam was 0.315m,0.5115m,0.12m,0.726m,1.9121m per year respectively, but the channel width has increased to

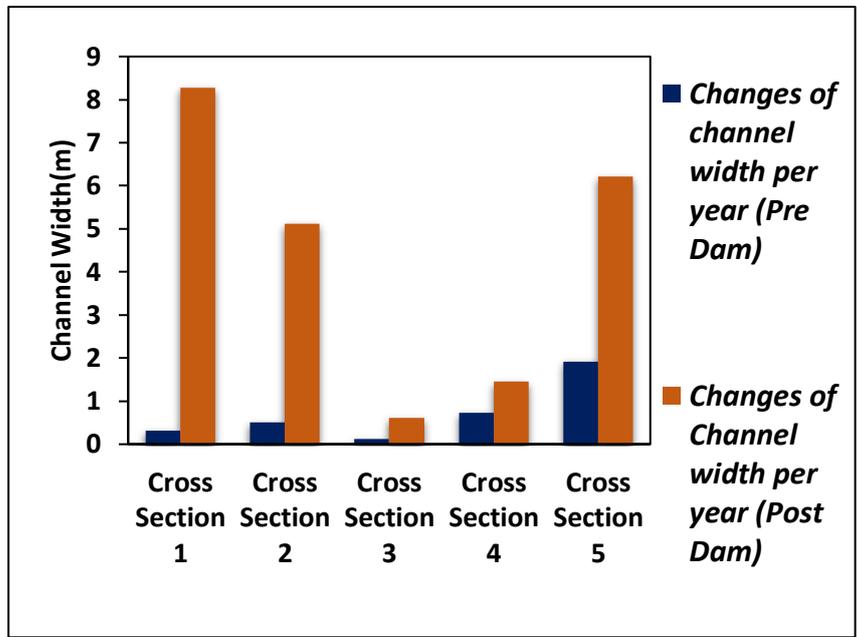


Figure no.22: changes of channel width per year in pre dam and post dam period.

8.281m,5.11044m,0.615m,1.45722m,6.20967m respectively per year along the channel cross sections(1,2,3,4,5) for construction of sarengkheda dam. So it can be said that the erosion of the river bank has increased after the construction of the sarengkheda dam and As a result, the condition of the river width has increased compared to the pre dam condition.

3.4.1 Changes of Water surface area:

Used in Geometry tool through QGIS, Water Surface Area has been measured to understand the impact of sarengkheda dam on surface water area of Tapi Riverdownstream in pre and post dam construction. It can be seen here that in 1996 and 2006 i.e. before the dam improvement, the water surface area of the Tapi River downstream was 4.615 square kilometres and 4.6997 square kilometres respectively. But after dam construction the flow of river water decreased a lot due to bar formation has increased and as a result the water surface area of the river has decreased a lot. After the dam impoundment in 2010 and 2019, the water surface area of the Tapi River downstream was 4.5123 square kilometres and 3.4687 square kilometres respectively. So it can be said that the water surface area of downstream of the river has been greatly reduced for sarengkheda dam construction.

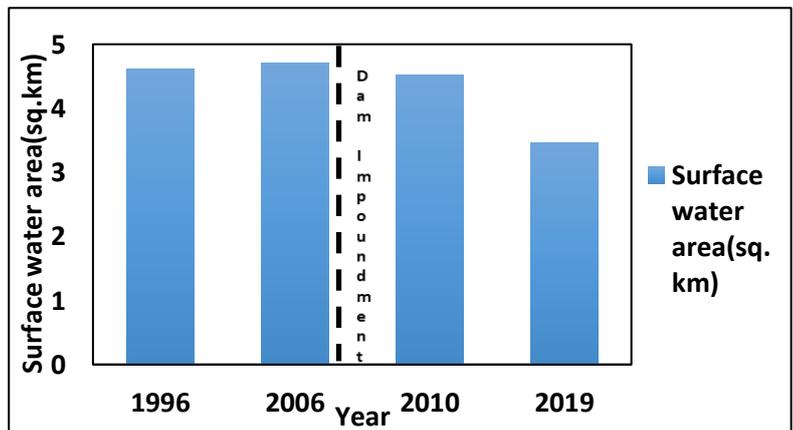


Figure no.23: changes of water surface area in pre dam and post dam period.

3.4.2 Changes of Bar area:

Just like the water surface area, the bar area of selected Tapi River downstream has been measured. It can be

seen here that since the dam construction, the river bar formation of downstream has increased a lot and as a result the water surface area has decreased a lot. Here the figure shows that Where 1996, Bar area was 0.509 sq.km and it increased slightly to 0.625 square kilometre in 2006 but after the dam construction in 2010 it increased to 1.056 km² and in recent 2019, it has increased to 2.7672 square kilometres. So it can be said here that since the construction of Sarengkheda Dam, bar formation in downstream of the Tapi River has increased a lot and as a result the water surface area of the Tapi River downstream has decreased.

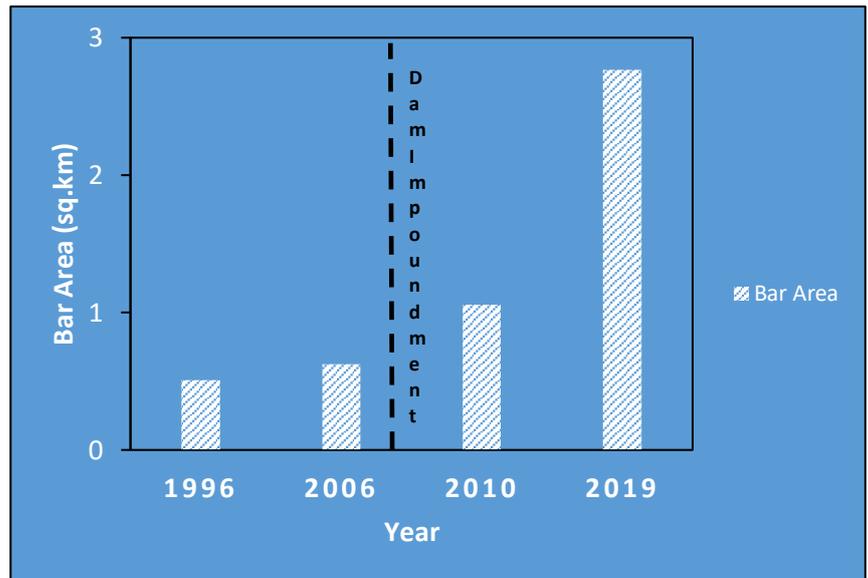


Figure no.23: changes of Bar area in pre dam and post dam period of the selected Tapi River downstream.

3.5 percentage change:

Percentage change is a general mathematical concept that represents the degree of change over time. Percentage change can be applied to show any degree of change that can be measured over time. Here, Positive values indicate a percentage increase whereas negative values indicate a percentage decrease.

Here, the percentage change of annual flow volume (cubic metre in billion) is $[(5.89 - 11.82)/11.82] \times 100\% = (-50.16)$. Hence, after the dam construction percentage of annual flow volume (cubic metre in billion) is decreased. In the same way, ten daily peak discharge, non-monsoonal discharge, sediment load, maximum gauge height, mean bed elevation percentage change are calculated and after calculation, the percentage change of these parameters values are (-11.8337), (-99.8381), (-58.4194), (-25.9363), (-0.82337) respectively.

The percentage change table shown below:

Table no. 8: Percentage change:

Parameters	Percentage Change
Annual Flow Volume (Cubic Metre In Billion)	-50.1692
Average 10 Daily Pick Discharge(Cumec)	-11.8337
Total Non-Monsoon Discharge(Cumec)	-99.8381
Sediment Load (In 10 ⁴ Tonnes)	-58.4194
Maximum Gauge Height(M) Per Year	-25.9363
Mean Bed Elevation (M)	-0.82337

So, it can be said that after the sarengkheda dam construction, ten daily peak discharge, sediment load, maximum gauge height, mean bed elevation has been decreased in the selected Tapi River downstream or study reach.

Chapter 4

4.0 Conclusion:

This dissertation describes the past and prospective changes in channel geometry of the 8.5 km reach of the Tapi River between the sarengkheda Dam and the sarengkheda gauging station. Historical time series data including water discharge rate, cross-section profile, and sediment transport and bed elevation data were gathered, estimated and applied for this study reach. The available data set is sufficiently detailed to describe the dynamic response in channel geometry of the Tapi River downstream after dam construction. This analysis corroborates prior findings about the changes in fluvial morphology. New findings are obtained from the detailed analysis of the changes in hydraulic geometry from channel hydraulic data interpretation (data collected from CWC website), and the modelling simulations predict river changes in channel width, bed elevation and bed degradation until 2014. The prime conclusions of this analysis are as follows:

- There are significant differences between pre and post-dam hydraulic geometry of the selected Tapi River downstream. The annual flow volume decreased up to 5.93 cubic metre in billion over the downstream for construction of the sarengkheda dam.
- The ten daily peak discharge also decreased to 71 Cumec for the sarengkheda dam impoundment.
- Non monsoonal discharge in the downstream of the Tapi River has been greatly reduced to dam's behind storage water used for irrigation purposes of the Nandurbar and dhule district of Maharashtra by construction of sarengkheda dam. it decreased up to 1184.32 Cumec over the 8.5 km reach downstream of the sarengkheda dam.
- The maximum gauge height also decreased up to 13.92 m for construction of sarengkheda dam.
- Sediment transport has been hampered for construction of sarengkheda dam and sediment load decreased up to 133454.58 (in 10^4 tonnes).
- The river channel bed elevation decreased up to an average 0.93 m and the bed degradation is increased, the river channel degraded up to 1.25 m over the 8.5 km reach downstream of the sarengkheda dam.

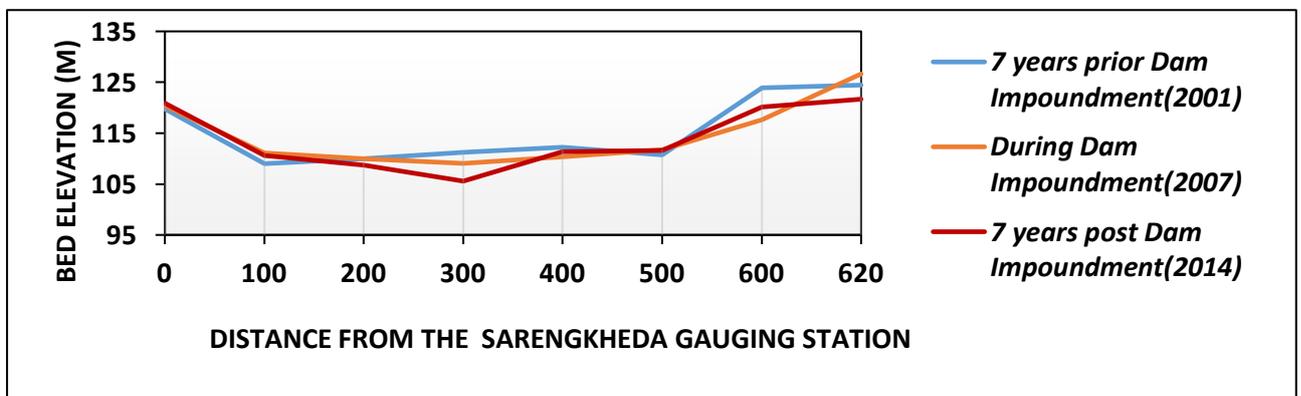


Figure no.21: Bed elevation changes in 2001, 2007 and 2014 of Tapi River downstream

- The channel width increased significantly and channel stability increased following construction of the sarengkheda dam.

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APPENDIX

TABLE NO. 9: Climate data of Nandurbar district (Data Source: maharashtra.gov.in. Retrieved on 20th November 2010)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average max Temperature (°C)	25	27	36	42	43	35	28	27	30	31	28	25	31
Average min Temperature (°C)	11	13	18	22	25	25	23	22	21	19	15	12	19
average rainfall (mm)	7	1.18	1.4	1.79	9.2	109	374	135	123	40.4	16.4	3.49	820.7

TABLE NO. 10: Annual flow volume (cubic meter in billion) at sarengkheda gauging station from 1985 to 2014

Annual flow volume per year			
year	annual flow volume (cubic metre in billion)	year	annual flow volume (cubic metre in billion)
1985	3.196316	2000	7.240666
1986	6.89646	2001	8.359878
1987	2.754176	2002	21.54382
1988	16.77654	2003	15.10543
1989	8.569786	2004	7.55098
1990	16.3095	2005	5.504609
1991	4.290639	2006	17.48462
1992	5.650146	2007	11.41549
1993	7.881479	2008	3.443221
1994	14.63964	2009	3.070562
1995	4.241598	2010	7.001196
1996	6.403402	2011	6.202783
1997	6.447079	2012	8.365975
1998	14.48919	2013	9.885846
1999	7.956285	2014	3.287762

TABLE NO. 11: Impact of sarengkheda dam on annual flow volume (cubic metre in billion)

Annual flow volume (cubic metre in billion)	
Pre dam	11.82
Post dam	5.89

TABLE NO. 12: Average ten daily peak discharge (Cumec) from 1985 to 2014

Average 10 Daily pick discharge per year			
year	Average 10 Daily pick discharge(cumec)	year	Average 10 Daily pick discharge(cumec)
1985	234.2444444	2000	259.9861111
1986	623.5788889	2001	316.8833333
1987	252.1636111	2002	688.5277778
1988	1040.638889	2003	666.9388889

1989	555.7172222	2004	369.3416667
1990	1402.611111	2005	371.5
1991	491.3138889	2006	1580.522222
1992	482.7333333	2007	961.0555556
1993	599.8	2008	332.15
1994	1061.436111	2009	310.065
1995	420.6944444	2010	505.4833333
1996	445.8805556	2011	432.7155556
1997	591.2833333	2012	918.4611111
1998	1258.127778	2013	806.9027778
1999	550.5313889	2014	444.5583333

TABLE NO. 13: Impact of dam on average ten daily peak discharge (Cumec).

Average 10 Daily pick discharge(Cumec)	
Pre dam	607.67
Post dam	535.76

TABLE NO. 13: Total non-monsoon discharge (Cumec) from 1985 to 2014

Total Non-Monsoon Discharge per year			
year	total non-monsoon discharge(Cumec)	year	total non-monsoon discharge(Cumec)
1985	1284.6	2000	2257.541
1986	767.2	2001	475.888
1987	989.089	2002	675.059
1988	2672.184	2003	722.8935
1989	939.721	2004	61.005
1990	4526.774	2005	180.901
1991	606.554	2006	3930.406
1992	989.0125	2007	698.142
1993	6135.941	2008	1
1994	840.052	2009	2.12
1995	250.025	2010	2.14
1996	6081.677	2011	2.12
1997	53168.4	2012	2.13
1998	6773.292	2013	2.12
1999	1768.193	2014	1.81

TABLE NO. 14: Mean non monsoon discharge (Cumec) on pre dam and post dam

Average non monsoon discharge(Cumec)	
pre dam	1186.24
post dam	1.92

TABLE NO. 15: Maximum gauge height (m) showing the flood magnitude from 1985 to 2014

MAXIMUM GAUGE HEIGHT SHOWING FLOOD MAGNITUDE			
YEAR	MAXIMUM GAUGE HEIGHT(M) PER YEAR	YEAR	MAXIMUM GAUGE HEIGHT(M) PER YEAR
1985	5.57	2000	112.2
1986	9	2001	109.41

1987	5.13	2002	109.68
1988	10.145	2003	9.6
1989	10.25	2004	8
1990	11.6	2005	8.1
1991	10.82	2006	18.7
1992	8.02	2007	110.28
1993	9.97	2008	6.6
1994	15.25	2009	7.4
1995	9.65	2010	8.45
1996	6.85	2011	8.1
1997	10.05	2012	12.35
1998	14.96	2013	117
1999	109.95	2014	118.4

TABLE NO. 16: Impact of dam on maximum gauge height (m)

MAXIMUM GAUGE HEIGHT(M) PER YEAR	
Pre dam	53.67
Post dam	39.75

TABLE NO. 17: Scatter plot showing the relationship between mean daily discharge (Cumec) and mean daily gauge height (m) on pre dam and post dam

SCATTER					
PRE DAM			POST DAM		
YEA R	MEAN DAILY DISCHARGE(cumec)	MEAN DAILY GAUGE HEIGHT(M)	YEA R	MEAN DAILY DISCHARGE(cumec)	MEAN DAILY GAUGE HEIGHT(M)
2000	229.6	30.0123	2008	109.1838	1.6197
2001	265.09	3.74	2009	97.3669	1.6439
2002	683.15	5.8987	2010	222.0065	2.9387
2003	478.99	3.0896	2011	196.689	3.303
2004	239.44	2.1798	2012	265.2833	3.0068
2005	174.55	1.3525	2013	313.4781	34.9566
2006	554.4336	3.3475	2014	104.2542	101.5589

TABLE NO. 18: Total sediment load (in 104 tonnes) from 1985 to 2014 at sarengkheda gauging station.

Total sediment load per year			
year	SEDIMENT LOAD (IN 10 ⁴ TONNES)	year	SEDIMENT LOAD (IN 10 ⁴ TONNES)
1985	29773.04577	2000	139664.5
1986	65044.65304	2001	107346.7
1987	52505.47184	2002	645986.1
1988	781044.6327	2003	209236.6
1989	111637.3202	2004	197337.3
1990	319317.0852	2005	32890.31
1991	52730.02294	2006	266635.2
1992	80945.40496	2007	163916.1
1993	123153.2381	2008	38243.68
1994	233937.0335	2009	16038.01

1995	60069.51767	2010	59030.59
1996	57519.5228	2011	98031.89
1997	57064.70425	2012	137044.7
1998	257446.8744	2013	117884.3
1999	137325.4807	2014	198641.5

TABLE NO. 19: Impact of dam on total sediment load (in 104 tonnes).

Average Total sediment load per year(IN 10 ⁴ TONNES)	
pre dam	1599096.861
post dam	664914.6215

TABLE NO. 20: Scatter plot showing the relationship between annual discharge (Cumec) and annual sediment load (in 104 tonnes) on pre dam and post dam

SCATTER					
pre dam			post dam		
YEAR	ANNUAL DISCHARGE (CUMEC)	ANNUAL SEDIMENT LOAD (IN 10 ⁴ TONNES)	YEAR	ANNUAL DISCHARGE (CUMEC)	ANNUAL SEDIMENT LOAD (IN 10 ⁴ TONNES)
2000	83804	139664.5	2008	39852.09	38243.68
2001	96757.85	107346.7	2009	35538.92	16038.01
2002	249349.8	645986.1	2010	81032.36	59030.59
2003	174831.4	209236.6	2011	71791.47	98031.89
2004	87395.6	197337.3	2012	96828.42	137044.7
2005	63710.75	32890.31	2013	114419.5	117884.3
2006	202368.3	266635.2	2014	38052.8	198641.5

TABLE NO. 21: Mean bed elevation (m) from 1995 to 2014 of Tapi River downstream at sarengkheda gauging station.

year	mean bed elevation (m)	year	mean bed elevation (m)
1995	112.74	2005	112.67
1996	112.15	2006	112.39
1997	112.39	2007	112.08
1998	112.59	2008	111.82
1999	112.5	2009	111.83
2000	112.85	2010	111.83
2001	112.84	2011	111.6
2002	112.34	2012	111.56
2003	112.65	2013	111.74
2004	112.48	2014	111.35

TABLE NO. 22: Cross profile of 7 years prior dam impoundment (2001), during dam impoundment (2007) and 7 years post dam impoundment (2014) of Tapi River downstream at sarengkheda gauging station.

Distance	Elevation (m) of 2001	Elevation (m) of 2007	Elevation (m) of 2014
0	119.82	120.435	120.905

10	117.53	120.475	118.98
20	112.315	120.565	118.935
30	110.655	119.665	116.03
40	109.565	117.87	114.2
50	109.27	115.945	114.765
60	109.355	114.24	111.125
70	109.515	112.61	111.045
80	109.405	110	110.81
90	109.175	110.84	110.695
100	109.005	111.14	110.545
110	108.945	111.34	110.405
120	109.01	111.52	110.395
130	108.905	111.55	110.325
140	108.85	111.31	110.265
150	108.92	111.28	110.125
160	109.27	111.26	109.915
170	109.21	110.96	109.925
180	109.575	110.8	109.575
190	109.665	110.33	108.975
200	110.005	110.03	108.775
210	110.335	109.955	108.825
220	110.495	109.735	108.625
230	110.57	109.745	108.475
240	110.715	109.675	108.275
250	110.71	109.745	107.575
260	110.695	109.405	107.075
270	110.8	109.385	106.875
280	110.96	109.285	106.575
290	111.145	109.365	106.075
300	111.28	109.055	105.575
310	111.455	108.855	105.475
320	111.535	108.935	104.975
330	111.61	109.155	105.775
340	111.75	109.435	105.675
350	111.845	109.475	106.675
360	112.005	109.645	107.675
370	112.02	109.985	108.575
380	112.13	110.135	109.575
390	112.12	110.145	111.4
400	112.26	110.335	111.3
410	112.1	110.555	111.41
420	112.05	110.785	111.35
430	111.995	111.025	111.38
440	112.015	111.025	111.5
450	111.91	111.325	111.61
460	111.76	111.125	111.62
470	111.72	111.16	111.635
480	111.43	111.435	111.65
490	110.935	111.795	111.625

500	110.69	111.755	111.6
510	110.635	111.725	111.8
520	111.585	111.965	111.55
530	114.395	111.568	111.49
540	116.085	111.495	111.4
550	116.77	111.385	111.6
560	117.06	111.352	111.348
570	117.95	111.335	120
580	122.105	111.645	120.3
590	124.04	112.915	120.5
600	123.95	117.68	120.13
610	123.12	122.98	120.28
620	124.45	126.65	121.68

TABLE NO. 23: Impact on dam on mean bed elevation (m) of Tapi River downstream at sarengkheda gauging station.

mean bed elevation (m)	
Pre dam	788.22
Post dam	781.73

TABLE NO. 24: Bed degradation (m) on years after dam impoundment

YEAR	BED DEGRADATION
2008	0.78
2009	0.77
2010	0.77
2011	1
2012	1.04
2013	0.86
2014	1.25

TABLE NO. 25: Changes of channel width per year in pre dam and post dam period.

cross section	changes channel with in pre dam	cross section	changes channel with in post dam
1	0.315	1	8.281
2	0.5115	2	5.11044
3	0.12	3	0.615
4	0.726	4	1.45722
5	1.9121	5	6.20967

TABLE NO. 26: Changes of water surface area in pre dam and post dam period.

year	surface water area(sq.km)
1996	4.615
2006	4.6997
2010	4.5123
2019	3.4687

TABLE NO. 27: Changes of bar area in pre dam and post dam period of the selected Tapi River downstream.

year	bar area(sq.km)
1996	0.509
2006	0.625
2010	1.056
2019	2.7672

TABLE NO.28: Percentage change

Parameters	Percentage Change
Annual Flow Volume (Cubic Metre In Billion)	-50.1692
Average 10 Daily Pick Discharge(Cumec)	-11.8337
Total Non-Monsoon Discharge(Cumec)	-99.8381
Sediment Load (In 10 ⁴ Tonnes)	-58.4194
Maximum Gauge Height(M) Per Year	-25.9363
Mean Bed Elevation (M)	-0.82337

TABLE NO. 29: Bed elevation changes in 2001, 2007 and 2014 of Tapi River downstream

Distance	Elevation (m) of 2001	Elevation (m) of 2007	Elevation (m) of 2014
0	119.82	120.435	120.905
100	109.005	111.14	110.545
200	110.005	110.03	108.775
300	111.28	109.055	105.575
400	112.26	110.335	111.3
500	110.69	111.755	111.6
600	123.95	117.68	120.13
620	124.45	126.65	121.68

I have completed my dissertation work.



Ethical Hacking



Submitted for the degree of B.com Honours in Accounting & Finance under the West Bengal state university .

The Economic Impact Of ETHICAL HACKINS& CYBER SECURITY

SUBMITTED BY

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I take this opportunity to thank the **BHAIRAB GANGULY COLLEGE** for the 3 amazing years of my college life and being the institution for pursuing the degree of M.com Special thanks to my supervisor Dr. Sanjit Kumar Das for his assistance and support in completing the project.

Also I would like to thank my friends and family members & Tution teacher who were supportive and helpful in preparing this project work at various stages. We Will always remember making this project work and knowledge gained while doing so. Concluding this with a heartiest thanks to my college and its faculty members for always being there when the students needed it. ThankyouThankyou.

ANNEXURE-1

SUPERVISOR'S CERTIFICATE

This is to certify that Mr. **BANTY CHAKRABORTY** student of M.com in Accounting & Finance of **Bhairab Ganguly College** under the (West Bengal state University) has worked under my supervision and guidance for his Project Work and prepared a Project Report with the title **THE Economic Impact Of ethical Hacking cyber security**-The Indian Scenario which she is submitting, is her genuine and original work to the best of my knowledge

Name: Dr. Sanjit Kumar Das.

Name of the College: BHAIRABGANGULY COLLEGE.

Designation: Associate Professor



Sanjit Kumar Das.
Sanjit Kumar Das.

Signature:

Place: Belgharia

Date: 5/09/2021

Annexure-2:

Student's Declaration

I here by declare that the Project Work with the title-**The Economic Impact Of Hackings** submitted by me for the partial fulfilment of the degree of M.COM in Accounting & Finance under the (West Bengal state university) is my original work and has not been submitted earlier to any other University for the fulfilment of the requirement of any course of study.

I also declare that no chapter of this manuscript in whole origin part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing detailed of such literature in the references.

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Abstract

In modern technical world internet is the main information provider and storing method. The security state on the internet is getting worse. Ethical Hacking techniques are introduced to increase online security in case of identifying ascertained security vulnerabilities related with programs of others. The national and private organizations immigrate most of their crucial data to the internet, hackers and crackers have wide opportunity to yield access to sensory information via the online application. Therefore, the importance of securing the systems from the affliction of immense hacking is to encourage the individuals who will cast back to the illegal attentive attacks on a computer system. Ethical hacking is an examination to revise an information technology surrounding for potential exhausted links .

The purpose of this paper was to study information security threats, information threat, and security threats source with a threat agents. It focused on the meaning of hackers and perceptions of public against hackers within organizations and in the society. The empirical literatures provide the best way to prevent the problems of hacking in the society and shows that white hats, black hats and spy hackers motivation strategies are largely involved and effective to check organizations

performance. It proposes quantitative approach with the design and descriptive for this study. The questionnaires will be used will be selected as a means to collect data with a simple random sample of the company's employees as observers / participants in the study.

Keywords- Hacker,Cracker,Ethicalhackers,Security,vulnerabilities

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CHAPTER 1

Introduction

➔ 1.1 Background of the study:

The original meaning of the word "hack" was born at Massachusetts Institute of Technology (MIT) in the US, and originally meant an elegant, witty or inspired way of doing almost anything.

Many early hacks took the form of elaborate practical jokes. In 1994, MIT students put a convincing replica of a campus police car on top of the Institute's Great Dome. Over the years, the meaning changed to become a term associated with breaking into or harming of any kind of computer system.

Newsgroups, Internet relay chat and increasingly, peer-to-peer chat and instant messaging, are buzzing with constant hacker chatter. Net security companies like Trusecure in the US, have the job of keeping an eye on these groups to work out which weak net spot they are planning to attack next.

The company currently tracks more than **11,000** individuals in about **900** different hacking groups and gangs. According to some estimates, there are **5,500** Net vulnerabilities that could be used theoretically to launch an attack, but only **80** or **90** are being used.

Information is esteem, and more corporations have understood that information security dangers can impact business prepare coherence and open picture, relations, can bring about monetary misfortune, impact relations with customers and accomplices and their fulfillment, and additionally make the issues with lawful dominant presences if there should be an occurrence of non-compliance (marchewka, 2014).

The world has turned into a worldwide town because of the broad utilization of the web where with a tick of a mouse, a solitary thought can achieve billions of individuals over the globe. The advantages of information for corporations are obviously incomprehensible.

➔ **1.2 Objective of the study:**

- ❖ Learn about the origins about compute hackings.
- ❖ Learn about some of the motivations for hackers & crackers.

- ❖ Learn about technologies that system intruders use learn about malicious code.
- ❖ To know various aspects of network hacking.
- ❖ Various encryption used by us to protect our data on a network.
- ❖ How to protect our data by eliminating such disadvantage of such technologies.
- ❖ Ethical hacking offers an objectives analysis of an organizations information security posture for organization of any level of
- ❖ Many a time, hacking is also defined as a form of cyber or internet crime which is punishable by law.

➔ **1.3 literature Review:**

A brief history of hacking-

- **1969:** Arpanet, the forerunner of the Internet, is founded. The first network has only four nodes.
- **1971:** First e-mail program written by Ray Tomlinson and on Arpanet used which now has 64 nodes.

- 1972: John Draper, also known as Captain Crunch, finds that a toy whistle given away in the cereal with the same name could be used to mimic the 2600 hertz tones phone lines used to set up long distance calls.
- 1980: In October, Arpanet comes to a crashing halt thanks to the accidental distribution of a virus.
- 1983: The internet is formed when Arpanet is split into military and civilian sections. War-games, a film that glamorises hacking, is released. Many hackers later claim it inspired them to start playing around with computers and networks.
- 1986: In August, while following up a 75 cent accounting error in the computer logs at the Lawrence Berkeley Lab at the University of California, Berkeley, network manager Clifford Stoll uncovers evidence of hackers at work. A year-long investigation results in the arrest of the five German hackers responsible.
- 1988: Robert Morris, a graduate student at Cornell University, sets off an

Internet worm programme that quickly replicates itself to over 6,000 hosts bringing almost the whole network to a halt. Morris is arrested soon afterwards and is punished by being fined \$10,000, sentenced to three years on probation and ordered to do 400 hours of community

- 1989: Kevin Mitnick is convicted of stealing software from Digital Equipment and codes for long-distance lines from US telephone company MCI. He is the first person convicted under a new law against gaining access to an interstate computer network for criminal purposes.
- 1993: Kevin Poulsen, Ronald Austin and Justin Peterson are charged with conspiring to rig a radio phone-in competition to win prizes. The trio seized control of phone lines to the radio station ensuring only their calls got through. The group allegedly netted two Porsches, \$20,000 in cash and holidays in Hawaii.
- 1994: A 16-year-old music student called Richard Pryce, better known by the hacker alias DataStream Cowboy, is arrested and charged with breaking into hundreds of computers including those at the Griffiths Air Force base, NASA and the Korean Atomic Research Institute.

His online mentor, "Kuji", has not been found.

Also this year, a group directed by Russian hackers breaks into the computers of Citi bank and transfers more than \$10 million from customers' accounts. Eventually, Citibank recovered all but \$400,000 of the pilfered money.

- 1995: In February, Kevin Mitnick is arrested for a second time. He is charged with stealing 20,000 credit card numbers. He eventually spends four years in jail and on his release his parole conditions demand that he avoid contact with computers and mobile phones.
- 1996: Popular websites are attacked and defaced in an attempt to protest about the treatment of Kevin Mitnick. The Internet now has over 16 million hosts and is growing rapidly.
- 1999: In March, the Melissa virus goes on the rampage and wreaks havoc with computers worldwide. After a short investigation, the FBI tracks down and arrests the writer of the virus, a 29-year-old New Jersey computer programmer, David L Smith.
- 2000: In February, some of the most popular Websites in the world such as

Amazon and Yahoo are almost overwhelmed by being flooded with bogus requests for data.

In May, the ILOVEYOU virus is unleashed and clogs computers Worldwide. Over the coming months, variants of the virus are released that manage to catch out companies that didn't do enough to protect themselves.

In October, Microsoft admits that its corporate network has been hacked and source code for future Windows products has been seen.



➔ **1.4 Research Methodology:**

a. Research method:-

The primary research method for this study is based on literature review and the methodology selected for this proposed study will be detailed here: the planned research design, methods of selection, data collection and analysis of results will be explained. It is hoped that the chosen methodology will provide useful information through the collection and analysis of data on the information security threat and the hackers.

b. Recommendation and conclusion:-

The whole problem with cyber-security presently is that since the cyber-criminal is constantly upgrading his knowledge and methods, most intrusion prevention software applications only deal with the methods previously used. The home user may benefit by subscribing to any one of a variety of news letters that stay

abreast of the hacker world. One such free newsletter can be offered by hackingalert.com.

Therefore, all users must take a large role in understanding the issues regarding cyber security and implementing their solutions. There are few recommendation that being suggested by scholars such as :

- ♠ **Education and training;** teaching a student to hack is still an issue we face today. Some feels that hacking should be put into curriculum in university and that they will teach students how to improve intrusion. It is same like giving a tools for the students on how to hack is simply like giving a crowbar for a burglar to break into a house. Certain policies need to be applied at university as we never know whether the acquired skills will be used for the good or bad. Policies need to address issue for students who conduct malicious acts by applying security checks on individuals which universities do certain courses such as ethical hacking. For example, a criminal background check, the requirement of some sort of professional certification, and student interviews are a few measures that could potentially weed out several, if not all, all students with potential malevolent intentions.
- ♠ **Trusting the potential enemy;** some of skilled professionals use their abilities to harm the society by finding vulnerabilities in the system and attacking them.

This is when we need the ethical hacker that may do the job. Two totally different individual would need to be hired to run tests for companies so that no on individual can have total freedom with anyone System.

- ♠ **Risk *management***, ethical hackers can minimize the risk of impact by exploring vulnerabilities beforehand to minimize the risk. Allow the company to undertake penetration test to find if they are vulnerable to attack. There should be some leeway and the hackers should be allowed to use certain tools to help them with their job without any question to identify security vulnerabilities in the company's system.
- ♠ **Penetration testing**; penetration testing defined as a legal and authorized attempt to locate and successfully exploit computer systems for the purpose of making those systems more secure. Includes probing for vulnerabilities as well as providing proof of concept attacks to demonstrate the vulnerabilities are real. Proper penetration testing always ends with specific recommendations for addressing and fixing the issues that were discovered during the test. This process will help to secure computers and networks against future attacks by finding security issues.

c. Data collection sources:

Secondary Data: Secondary data refers to the data which has already been generated and is available for use. The data about Hacking, Economic impacts of hackings, bank accounts & ATM hackings is taken from www.wikipedia.com, www.moneycontrol.com, & www.rbi.org.in, Books **HACKING -JOHN SLAVIO**, **HAKING THE ART OF EXPLOITATION - JON ERICKSON**, Magazine Business India.

➔ **1.5 Limitations of the study:**

Advantage of cyber security:

- I. Improved security of cyberspace.
- II. Increase in cyber defence.
- III. Increase in cyber speed.
- IV. Protecting company data and information .
- V. Protects systems and computers against virus, worms, malware and spyware, etc.
- VI. Protects individual private information.
- VII. Protects networks and resources.

- VIII. Fight against computer hackers and identity theft.
- IX. Minimizes computer freezing and crashes.
- X. Gives privacy to users.

Disadvantages of Cyber Security :

- I. It will be costly for average users.
- II. Firewalls can be difficult to configure correctly.
- III. Need to keep updating the new software in order to keep security up to date.
- IV. Make system slower than before.
- V. Incorrectly configured firewalls may block users from performing certain actions on the Internet, until the firewall configured correctly.

CHAPTER 2

CONCEPTUAL FRAMEWORK

➔ **2.1 What is Hacking?**

Hacking is the activity of identifying weaknesses in a computer system or a network to exploit the security to gain access to personal data or business data. An example of computer hacking can be: using a password cracking algorithm to gain access to a computer system.

Local network test simulates an employee or other authorized person who has a legal connection to the organization's network. The primary defences that must be defeated here are internet firewalls, international web serves, server security measures, and e-mail systems.

In **stolen laptop computer test** , the laptop computer of a key employee, such as an upper level managers, through public sources on the internet. This test represents the most commonly Perceived threat. A well-defended system shouldn't allow this kind of intruder to do anything.

A valid user a valid access to at least some of the organization's computers & networks. This test whether or not insiders with some access can extend that access beyond what has been prescribed. A well-defended system should allow an insider to access only the



areas and resources that the system administrator has assigned to the insider.

➔ 2.2 What is a hacker?

A hacker is an individual who uses computer, networking or other skills to overcome a technical problem. The term also may refer to anyone who uses their abilities to gain unauthorized access to systems or networks in order to commit crimes. A hacker may, for example, steal information



to hurt people via identity theft or bring down a system and, often, hold it hostage in order to collect a ransom. The term *hacker* has historically been a divisive one, sometimes being used as a term of admiration for individuals who exhibit a high degree of skill and creativity in their approach to technical problems.

Hacker was first used in the 1960s to describe a programmer or an individual who, in an era of highly constrained computer capabilities, could increase the efficiency of computer code in a way that removed, or *hacked*, excess machine code instructions from a program. It has evolved over the years to refer to someone with an advanced understanding of computers, networking programming or hardware.

➔ **2.3 Different types of hackers:**

In the past, the security community informally used references to hat colour as a way to identify different types of hackers, usually divided into five main types. Hackers are classified according to the intent of their actions. The following list classifies types of hackers according to their intent-

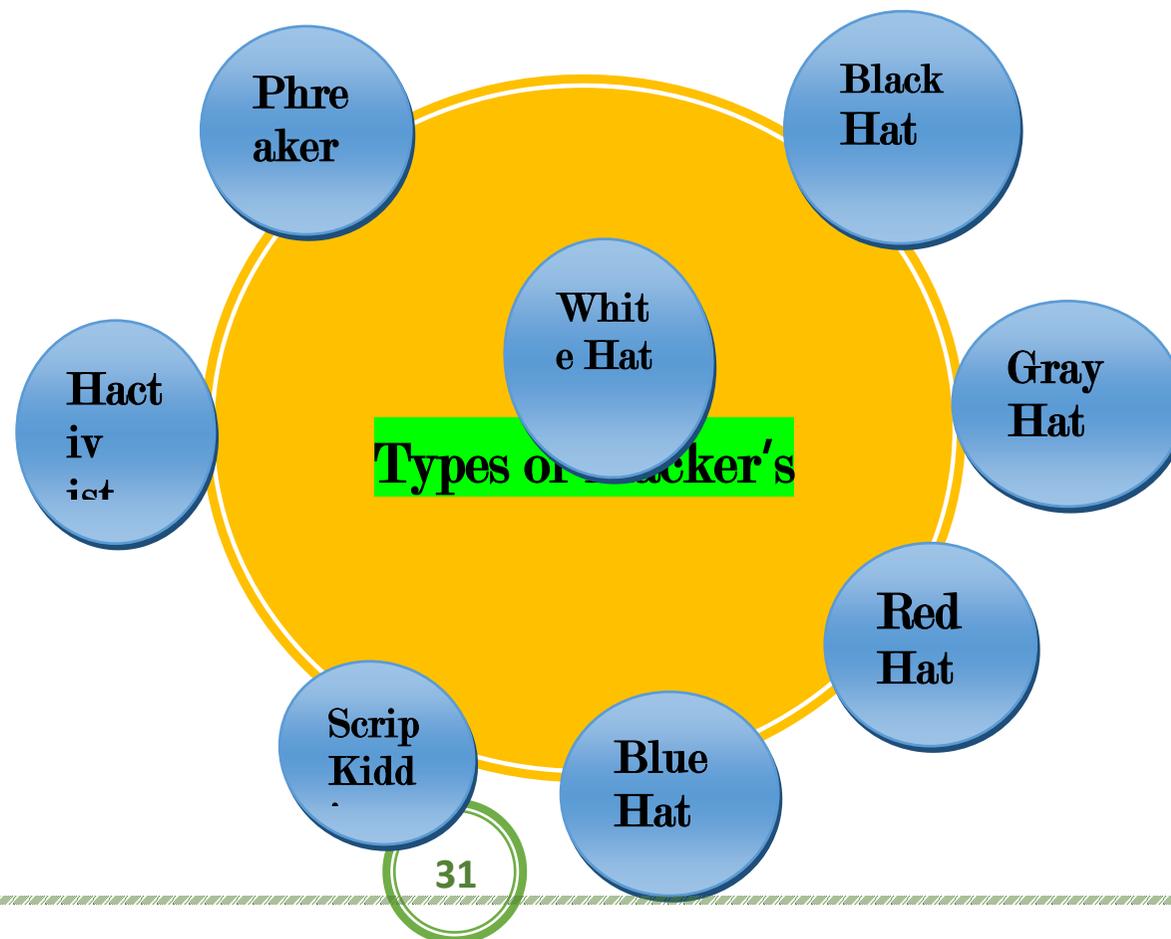
- I. **Ethical hackers (White hat)** or authorized hackers - previously known as *white hat hackers* -- strive to operate in the public's best interest rather than to create turmoil. Many ethical hackers who work doing pen testing were hired to attempt to break into the company's networks to find and report on security vulnerabilities. Kite security firms then help their customers mitigate security issues before criminal hackers can exploit them.

- II. **Threat actors(Black hat):** or unauthorized hackers -- previously known as *black hat hackers* -- intentionally gain unauthorized access to networks and systems with malicious intent. This includes stealing data, spreading malware or profiting from ransomware, vandalizing or otherwise damaging systems, often in an attempt to gain notoriety. Threat actors are criminals by definition because they violate laws against accessing systems without authorization, but they may also engage in other illegal activity, including corporate espionage, identity theft and distributed denial-of-service (DDos) attacks.
- III. **Grayhat hackers :** fall somewhere between ethical hackers and threat actors. While their motives may be similar to those two groups, gray hats are more likely than ethical hackers to access systems without authorization; at the same time, they are more likely than threat actors to avoid doing unnecessary damage to the systems they hack. Although they aren't typically -- or only -- motivated by money, gray hat hackers may offer to fix vulnerabilities they have discovered through their own unauthorized activities rather than using their knowledge to exploit vulnerabilities for illegal profit.
- IV. **Red hat hackers:** also called *eagle-eyed* or *vigilante hackers*, are similar to ethical hackers. Red hat hackers intend to stop unethical attacks by threat actors. While

red hat hackers may have a similar intent to ethical hackers, they differ in methodology, as red hat hackers may use illegal or extreme courses of action. Often, red hat hackers will deploy cyber attacks toward the systems of threat actors.

- V. **Blue hat hackers**: also known as *vengeful hackers*, use hacking as a social weapon. Frequently, it is used as a means for revenge against a person, employer or other organization. Hackers who post personal and confidential data online to ruin reputations or attempt to gain unauthorized access to email and social media accounts are classified as blue hats.
- VI. **Script Kiddies**: are amateur, inexperienced hackers who attempt to use pre-written scripts in their hacking efforts. Often, these are fledgling hacking enthusiasts who cause little damage.
- VII. **Hactivist**: are organizations of hackers that use cyber attacks to affect politically motivated change. The purpose is to bring public attention to something the hacktivist believes might be a violation of ethics or human rights. Hactivism attacks may attempt to reveal evidence of wrongdoing by publicizing private communications, images or information.

VIII. Phreaker: A hacker who identifies and exploits weaknesses in telephones instead of computer



➔ 2.4 Type of Cybercrime

The following list presents the common types of cybercrimes:

- ❖ Computer Fraud: Intentional deception for personal gain via the use of computer systems.
- ❖ Privacy violation: Exposing personal information such as email addresses, phone number, account details, etc. on social media, hacking a websites, etc.
- ❖ Identity Theft: Stealing personal information from somebody and impersonating that person.
- ❖ Sharing copyrighted files/information: This involves distributing copyright protected files such as eBooks and computer programs etc.
- ❖ Electronic funds transfer: This involves gaining an un-authorized access to bank computer networks and making illegal fund transfers.
- ❖ Electronic money laundering: This involves the use of the computer to launder money.

- ❖ ATM Fraud: This involves intercepting ATM card details such as account number and PIN numbers. These details are then used to withdraw funds from the intercepted accounts.
- ❖ Denial of Service Attacks: This involves the use of computers in multiple locations to attack servers with a view of shutting them down.
- ❖ Spam: Sending unauthorized emails. These emails usually contain advertisements.

➔ 2.5 What is Ethical Hacking?

Ethical Hacking is identifying weakness in computer systems and/or computer networks and coming with countermeasures that protect the weaknesses. Ethical hackers must abide by the following rules.

- Get written permission from the owner of the computer system and/or computer network before hacking.
- Protect the privacy of the organization been hacked.
- Transparently report all the identified weaknesses in the computer system to the organization.
- Inform hardware and software vendors of the identified weaknesses.

➔ **2.6 Types of Hacking:**

We can broadly classify hacking into five different classes based on what a hacker is trying to achieve. They are as follows:

1. Website Hacking:

Website hacking can be defined as a way of taking unauthorized control over a website and its related software such as databases and other interfaces.

2. Network Hacking: Network Hacking is a way of gathering all the critical information about a network with an intent to harm the network and block its operations.

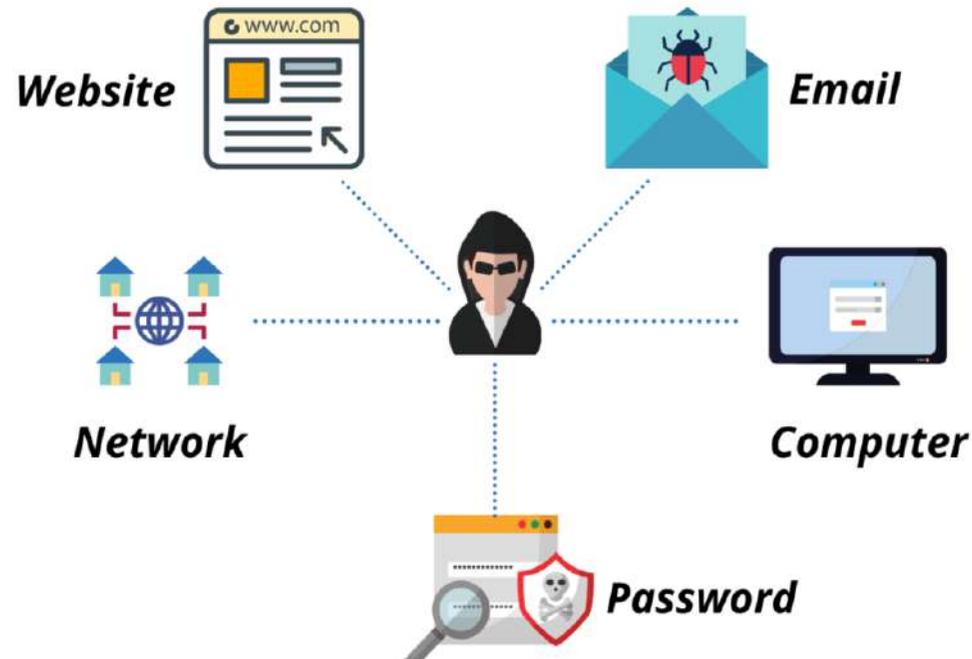
3. Email Hacking:

Email Hacking is a way of gaining unauthorized access to an email account to spoof all the emails and send emails containing spam links and third-party threats.

4. Password Hacking:

Password Hacking is a way of recovering secret passwords that are stored in a database or transferred over a network.

5. Computer Hacking: Computer Hacking is a way of gaining unauthorized access to a computer system by compromising its credentials.



➔ 2.7 What is a Cyber Attack? & Types of Cyber Attacks

A cyber attack refers to an action designed to target a computer or any element of a computerized information system to change, destroy, or steal data, as well as exploit or harm a network. Cyber attacks have been on the rise, in sync with the digitization of business that has become more and more popular in recent years.

While there are dozens of different types of attacks, what follows are the 20 most common cyber attack examples.

TOP 10 MOST COMMON TYPES OF CYBER ATTACKS OR HACKING TECHNIQUES:

i. DoS and DDoS Attacks:

A denial-of-service (DoS) attack is designed to overwhelm the resources of a system to the point where it is unable to reply to legitimate service requests. A distributed denial-of-service (DDoS) attack is similar in that it also seeks to drain the resources of a system. A DDoS attack is initiated by a vast array of malware-infected host

machines controlled by the attacker. These are referred to as “denial of service” attacks because the victim site is unable to provide service to those who want to access it.

DoS and DDoS attacks are different from other types of attacks that enable the hacker to either obtain access to a system or increase the access they currently have. With these types of attacks, the attacker directly benefits from their efforts. With DoS and DDoS attacks, on the other hand, the objective is simply to interrupt the effectiveness of the target's service. If the attacker is hired by a business competitor, they may benefit financially from their efforts.

ii. MITM Attacks:

Man-in-the-middle (MITM) attacks refer to breaches in cybersecurity that make it possible for an attacker to eavesdrop on the data sent back and forth between two people, networks, or computers. It is called a “man in the middle” attack because the attacker positions themselves in the “middle” or between the two parties trying to communicate. In effect, the attacker is spying on the interaction between the two parties.

In a MITM attack, the two parties involved feel like they are communicating as they normally do. What they do not know is that the person actually sending the message

illicitly modifies or accesses the message before it reaches its destination. Some ways to protect yourself and your organization from MITM attacks is by using strong encryption on access points or to use a virtual private network (VPN).

iii. Phishing Attacks:

A phishing attack occurs when a malicious actor sends emails that seem to be coming from trusted, legitimate sources in an attempt to grab sensitive information from the target. Phishing attacks combinesocial engineering and technology and are so-called because the attacker is, in effect, “fishing” for access to a forbidden area by using the “bait” of a seemingly trustworthy sender.

To execute the attack, the bad actor may send a link that brings you to a website that then fools you into downloading malware or giving the attacker your private information. In many cases, the target may not realize they have been compromised, which allows the attacker to go after others in the same organization without anyone suspecting malicious activity.

iv. Password Attack:

Passwords are the access verification tool of choice for most people, so figuring out a target's password is an attractive proposition for a hacker. This can be done using a few different methods. Often, people keep copies of their passwords on pieces of paper or sticky notes around or on their desks. An attacker can either find the password themselves or pay someone on the inside to get it for them.

An attacker may also try to intercept network transmissions to grab passwords not encrypted by the network. They can also use social engineering, which convinces the target to input their password to solve a seemingly "important" problem. In other cases, the attacker can simply guess the user's password, particularly if they use a default password or one that is easy to remember such as "1234567."

v. SQL Injection Attack:

Structured Query Language (SQL) injection is a common method of taking advantage of websites that depend on databases to serve their users. Clients are computers that get information from servers, and an SQL attack uses an SQL query sent from the client to a database on the server. The command is inserted, or "injected", into a data plane in place of something else that normally goes there, such as a password or login. The server that holds the database then runs the command and the system is penetrated.

For example, the CEO can be kept from accessing areas of the network even if they have the right to know what is inside. Applying a least-privileged policy can prevent not just bad actors from accessing sensitive areas but also those who mean well but accidentally leave their login credentials vulnerable to attackers or leave their workstations running while away from their computers.

vi. Web Attacks:

Web attacks refer to threats that target vulnerabilities in web-based applications. Every time you enter information into a web application, you are initiating a command that generates a response. For example, if you are sending money to someone using an online banking application, the data you enter instructs the application to go into your account, take money out, and send it to someone else's account. Attackers work within the frameworks of these kinds of requests and use them to their advantage.

vii. Insider Threats:

Sometimes, the most dangerous actors come from within an organization. People within a company's own doors pose a special danger because they typically have access to a variety of systems, and in some cases, admin privileges that enable them to make critical changes to the system or its security policies.

One of the best ways to prevent insider threats is to limit access to sensitive systems to only those who need them to perform their duties. A. The user can only access the secure area if both the password and the number are correct.

viii. Trojan Horses:

A Trojan horse attack uses a malicious program that is hidden inside a seemingly legitimate one. This threat gets its name from the story of the Greek soldiers who hid inside a horse to infiltrate the city of Troy and win the war. Once the “gift” was accepted and brought within the gates of Troy, the Greek soldiers jumped out and attacked. In a similar way, an unsuspecting user may welcome an innocent-looking application into their system only to usher in a hidden threat.

To prevent Trojan attacks, users should be instructed not to download or install anything unless its source can be verified. Also, NGFWs can be used to examine data packets for potential threats.

ix. Birthday Attack:

In a birthday attack, an attacker abuses a security feature: hash algorithms, which are used to verify the authenticity of messages. The hash algorithm is a digital signature, and the receiver of the message checks it before accepting the message as authentic. If a

hacker can create a hash that is identical to what the sender has appended to their message, the hacker can simply replace the sender's message with their own. The receiving device will accept it because it has the right hash.

To prevent birthday attacks, use longer hashes for verification. With each extra digit added to the hash, the odds of creating a matching one decrease significantly.

x. Malware Attack:

Malware is a general term for malicious software, hence the “mal” at the start of the word. Malware infects a computer and changes how it functions, destroys data, or spies on the user or network traffic as it passes through. Malware can either spread from one device to another or remain in place, only impacting its host device.

In a malware attack, the software has to be installed on the target device. This requires an action on the part of the user. Therefore, in addition to using firewalls that can detect malware, users should be educated regarding which types of software to avoid, the kinds of links they should verify before clicking, and the emails and attachments they should not engage with.

➔ 2.8 The Top 5 Ethical Hackers in India :



1. Vivek Ramachandran :

Vivek Ramachandran a top Ethical hacker in India, he is also security researcher, cyber security specialist and the founder of Pentester Academy. He is a B.tech graduate from IIT Guwahati and an advisor to the computer science department's security lab. His field of expertise includes ethical hacking, cyber security, network security, wireless security, exploit researcher. Computer forensics, compliance, and e-Governance, compliance. He discovered the caffeLatte attack, broke WEP cloaking and created Chellam, the first Wi-Fi Firewall. He has written many books which are published worldwide in mid of

2011- Few of his books are " Wireless Penetration Testing " and " The Meta sploit Mega primer".

Vivek started SecurityTube.net in 2007, Youtube which holds the largest collection of security research videos on the web to learn ethical hacking and cyber security. He is also an internationally acclaimed speaker and has spoken in hundreds of conferences worldwide. Some of his known and renowned talks include - "WEP Cloaking Exposed" at Defcon 15, USA, Las Vegas and "The Caffe Latte Attack" at Toorcon, San Diego, USA. Both of these conferences talks were covered extensively by international media BBC Online, The Register, Mac world, Network World, Computer Online etc. He also conducts in-person trainings in the US, Europe and Asia.

Vivek's work on wireless security has been quoted in BBconline, Infoworld, The register, MacWorld, IT World Canada etc. He was recommended in the evening edition of CBS5 in the US where he coached the general public on the dangers of using WEP in wireless. He also worked as Cyber security consultant at Fortune 500 companies in the field of Information Security. The Caffe Latte Attack discovered by Vivek was covered by CBS5 news. Vivek is now a part of Wireless Security textbooks and various other wireless Penetration testing tools.



2. Trishneet Arora :

Trishneet Arora is an ethical hacker, entrepreneur who found a TAC Security, a Cyber Security company that provides protection to corporations against data theft and network vulnerabilities. Some of TAC's clients include the Central Bureau of Investigation (CBI), Punjab Police, Gujarat Police, Reliance Industries Limited, Amul, Ralson (India) Ltd, Avon Cycles Ltd, MNCs from Dubai and UK.

In 2014, Trishneet received a State Award by the Chief Minister of Punjab, Mr. Prakash Singh Badal. Following which he was appointed as the IT advisor of Punjab Police Academy. In the same year deputy Chief Minister of Punjab Sukhbir Singh Badal released his second book "Hacking Talk with Trishneet Arora". In 2018 he was awarded

Leaders of Tomorrow by St. Gallen Symposium, Forbes 30 Under 30 by Forbes Asia, Entrepreneur 35 Under 35 by Entrepreneur (magazine), In 2017 he was awarded News Maker of 2017 by Man's World (magazine), The 50 Most Influential Young Indians by GQ Magazine so on, Arora has won many more awards in a row.

Recently, he received the Punjab Icon Award in Mumbai alongside Virender Sehwag, Malvinder Mohan Singh, RS Sodhi, AyushmannKhurrana and Surveen Chawla.

3. Ankit Fadia:



Ankit Fadia is an author, speaker, television host, and an “ethical hacker”, his field of specialization is OS and Networking based tips and tricks, proxy website and lifestyle.

In 2008 Ankit started a television show on MTV India called “What The Hack”, Which he co-hosted with Jose Covaco. This show was mainly about how to make good use of the

internet and answered people's technology-related questions. In 2013, Ankit started with a YouTube channel "Geek On The Loose", in collaboration with PING networks, where he started giving technology related tips and tricks.

After Ankit's first book "The Unofficial Guide to Computer Hacking" came in the limelight, Ankit became popular among the corporate clients in India as well as on the Conference speaking panels. He published more books on Computer Security, started giving seminars across schools and colleges in India. Ankit started providing his own computer security training courses, including the "Ankit Fadia Certified Ethical Hacker" programme in coordination with Reliance World.

4. Sunny Vaghela :

Sunny Vaghela founder of Tech defense labs, was graduated from Nirma University. Sunny Vaghela is ethical hacker who exposed the loopholes in SMS and Calls in mobile network at the age of 18. He also launched websites where the complaint against



cybercrime was registered and solved.

Sunny been ethical hacker he also finds loopholes like “Cross-site scripting” and “session Hijacking” in popular websites one among them is “www.orkut.com” at his age of 19. As Ethical Hacker he solved many challenging cases of cyber-crimes for Ahmedabad crime branch including credit card Fraud cases, Biggest Data theft cases, Phishing cases, Orkut fake profile cases, etc.

Sunny Vaghela has also been leading training and consulting team at Techdefence for last 7 years. More than 60000 people are trained under Sunny from 650+ Educational Institution under Hack Track & CCSE verticals of Techendence. He also assists Financial Institutions, E-Commerce, Logistic Industry, and Media.

5. Benild Joseph:



Benild Joseph is a renowned Ethical Hacker and also TEDx Speaker , Security Researcher with definitive experience in the field of computer security in India.

He is a renowned speaker at security conferences in India and abroad. He was a speaker at The APWG Vienna Symposium on Global Cybersecurity Awareness Messaging at the United Nations. Benild works with various corporate companies, law enforcement agencies and government organizations. He has also worked on various security projects at International Cyber Threat Task Force (CTTF) and Cyber Security Forum Initiative (CSFI).

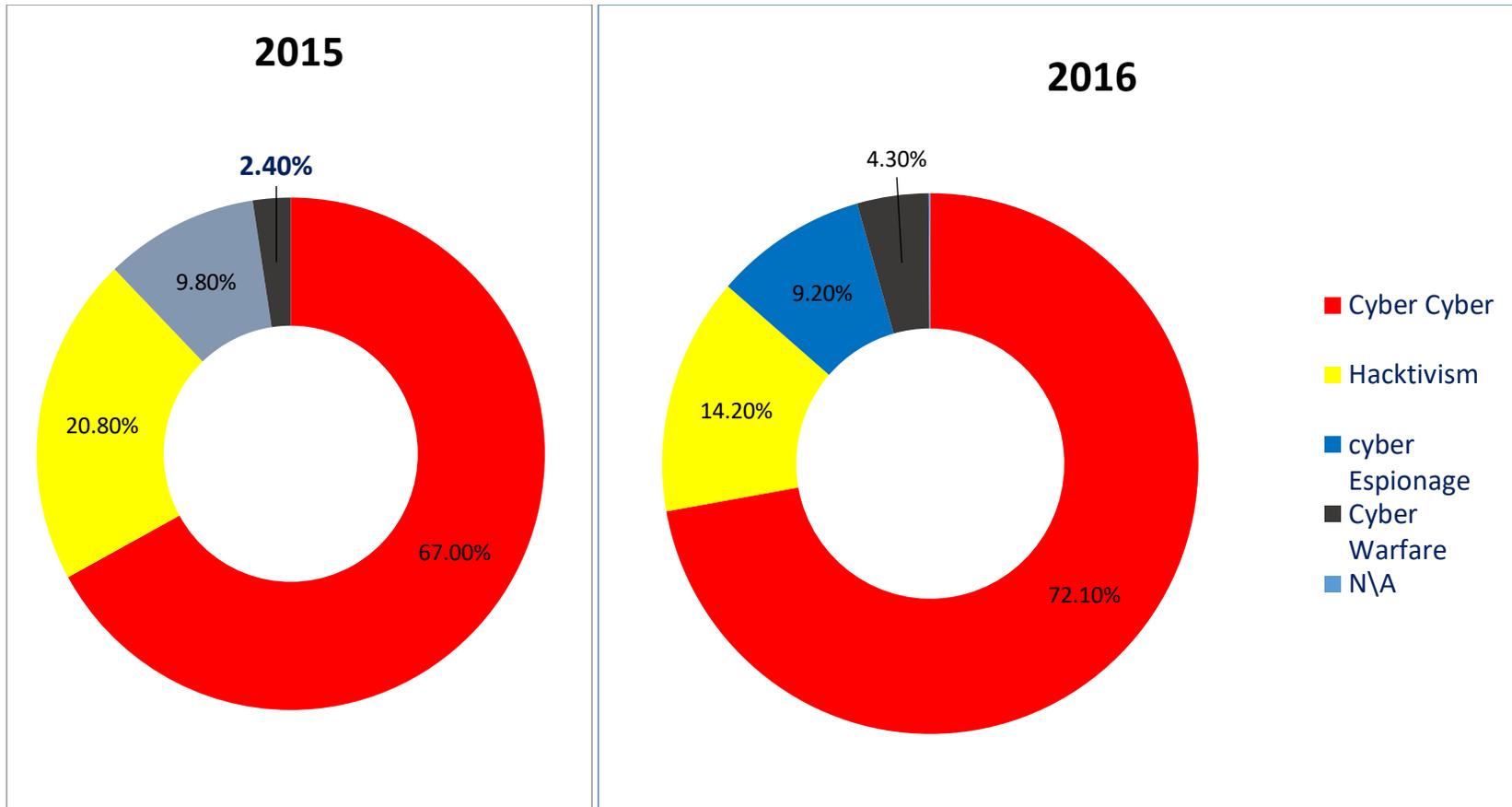
Benild is the author of CCI-book written for law enforcement agencies in India and is also profiled in Ethical Hacking the Hacker-book written by Roger Grimes along with Mark Russinovich, Bruce Schneier, Kevin Mitnick and World's best white hat hackers and is also listed among the Top 10 Ethical Hackers in India by Microsoft Social Forum and Silicon India Magazine. He has been interviewed by various TV channels and Newspapers where he has shared his experiences relating to cyber security and cyber crimes.

CHAPTER 3

PRESENTATION&ANALYSIS

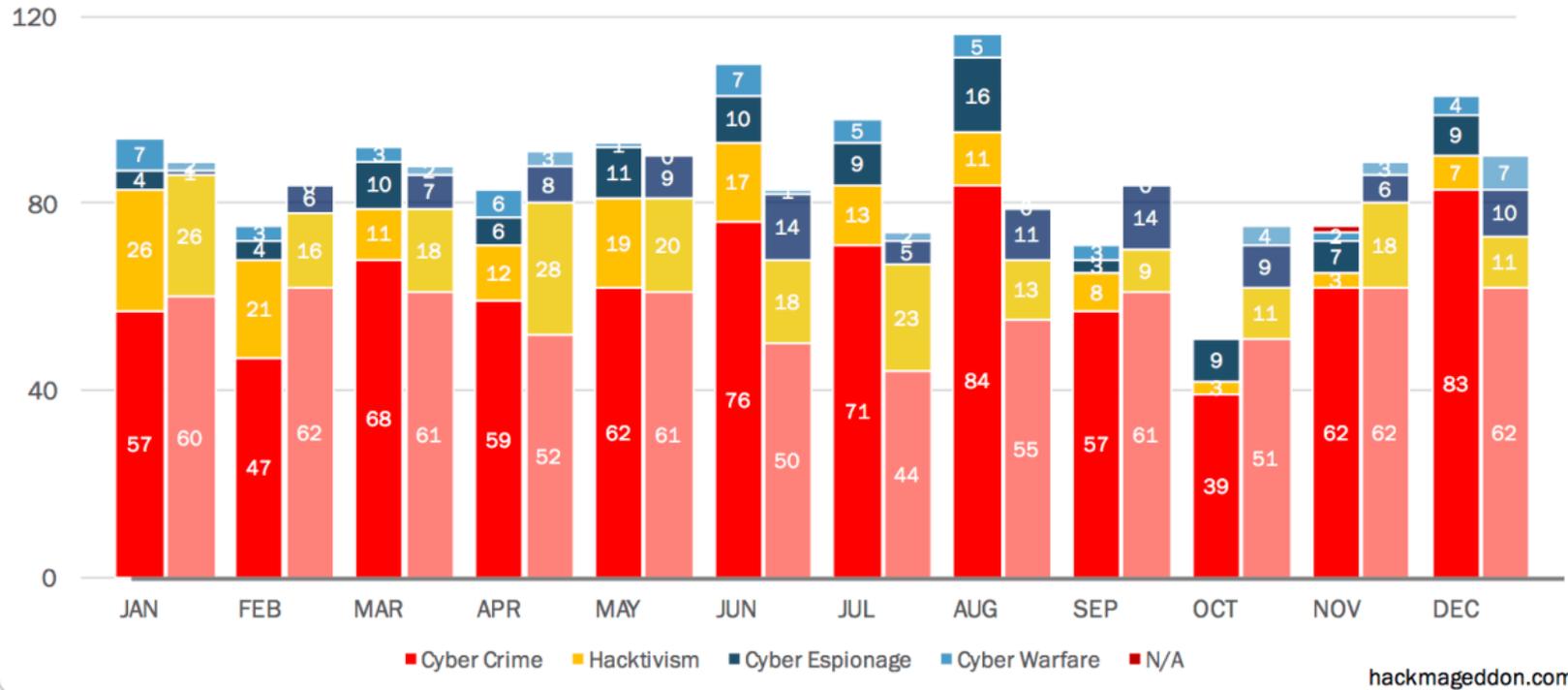
➔ **3.1 Motivation Behind Attacks: 2015 VS 2016**

NAME OF ATTACKS	2015	2016
Cyber crime	67.0%	72.1%
Hacktivism	20.8%	14.2%
Cyber Espionage	9.8%	9.2%
Cyber warfare	2.4%	4.3%
N/A	-	0.1%



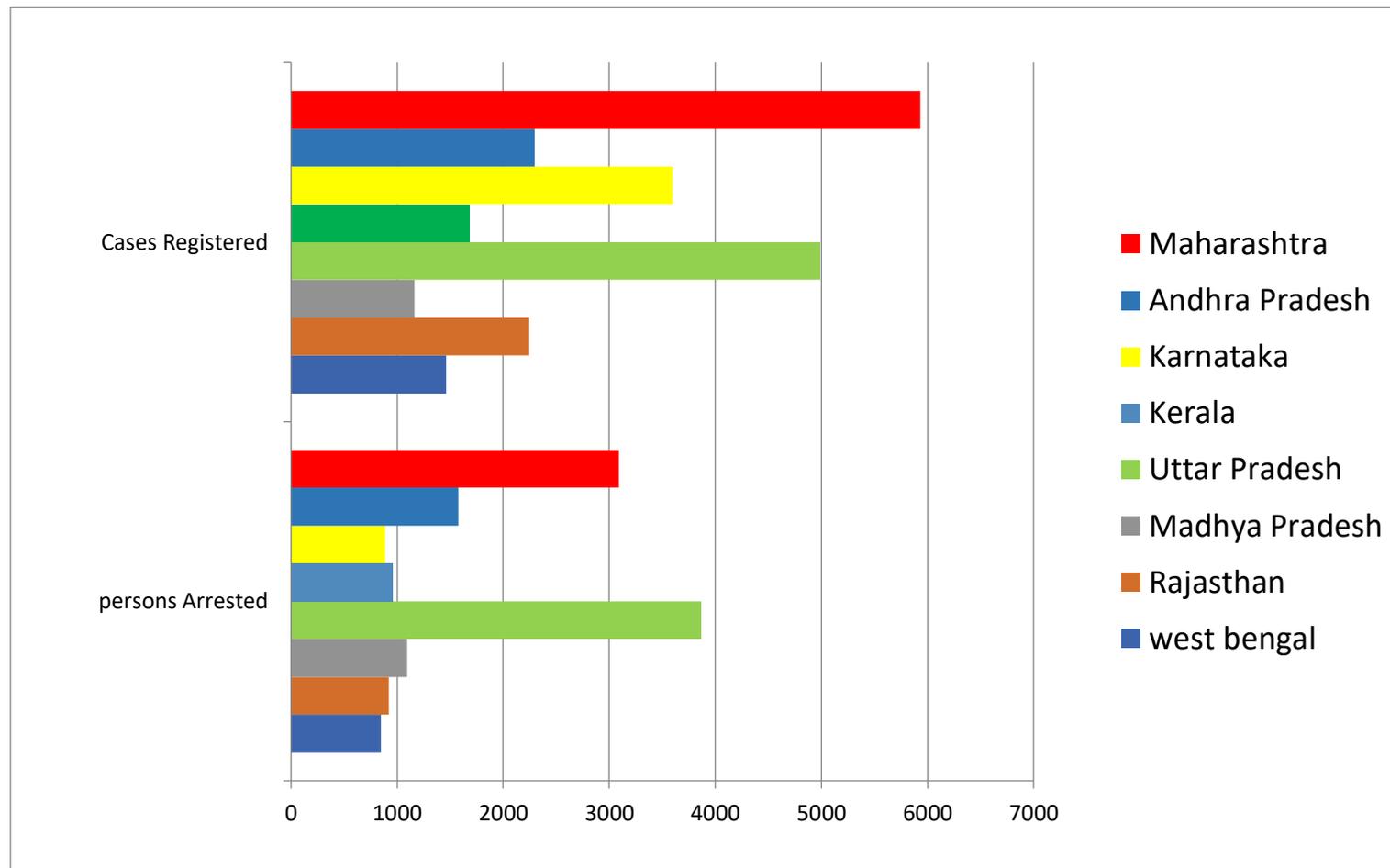
the **Drill Down** chart of the motivations on a monthly basis highlights the differences. Clearly the Summer 2016 was hot also from an Infosec perspective.

Motivations Behind Attacks Drilldown 2016 (LEFT) VS 2015 (RIGHT)



➔ 3.2 Cyber Crime In States(2011-2015):

States	West Bengal	Rajasthan	Madhya Pradesh	Uttar Pradesh	Kerala	Karnataka	Andhra Pradesh	Maharashtra
persons ARRESTED	847	920	1093	3868	958	888	1577	3088
Cases Registered	1461	2243	1162	4990	1680	3597	2295	5935



➔ 3.3 Cyber security: An Indian Perspective:



A look at a few popular recent attacks on Indian cyberspace:

- In July 2016, a phishing email sent to an employee at Union Bank of India, hackers accessed the credentials to execute a fund transfer, unsuccessfully swindling Union Bank of India of \$171 million.
- The infamous Wannacry Ransomware attack even impacted servers in Indian states such as Andhra Pradesh and West Bengal.
- Popular online grocery service provider, Bigbasket faced a data breach by a group named “Shinyhunters” who reportedly have compromised the data of more than 2 million users.
- F&B giant, Haldiram’s were demanded \$750,000 as part of a ransomware attack
- In May 2020, it was reported that data of 40 million Truecaller Indian users was reportedly put out for sale on the dark web.

Rising cyber threats after COVID-19, observes a Deloitte survey, pose serious concerns, especially for Indian banks. Globally, cyber attacks against financial institutions increased 238% during the pandemic between February 2020 and April 2020. Citing IBM’s data breach report, Das revealed that the Indian companies incurred an average of 140 million total costs of a data breach in 2020, an increase of 9.4% from 2019. The top 3 root causes of data breaches were categorised as 53% malicious attack, 26% system glitch and 21% human error.

CHAPTER 4

Prevention of cyber attacks

➔ 4.1 prevention:

Preventing a breach of your network and its systems requires protection against a variety of cyber attacks. For each attack, the appropriate countermeasure must be deployed/used to deter it from exploiting a vulnerability or weakness. The first line of defence for any organization is to assess and implement security controls.

Some of the most common ways to prevent cyber attacks include:

- Developing cyber security policies
- Implementing security awareness training

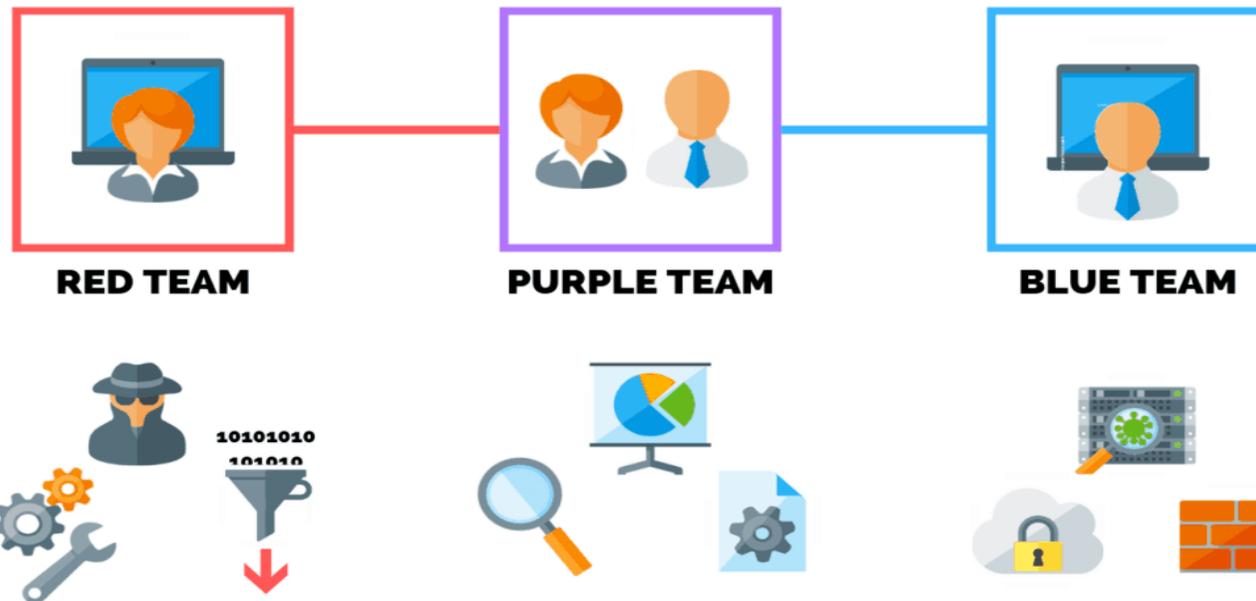
- Installing spam filters and anti-malware software
- Deploying Next-Generation Firewalls (NGFW)
- Installing endpoint detection & response (EDR)

Keep in mind that the list above is the bare minimum an organization needs to deter most common attacks.

For advanced cyber attacks, a team of at least 2-3 information security engineers would be required to manage custom software solutions and advanced testing of an organization's environment including:

- Performing vulnerability assessments
- Conducting routine penetration testing
- Implementing security information and event management (SIEM)
- Deploying intrusion detection & prevent software (IDS and IPS)
- Creating a data loss prevention (DLP) program

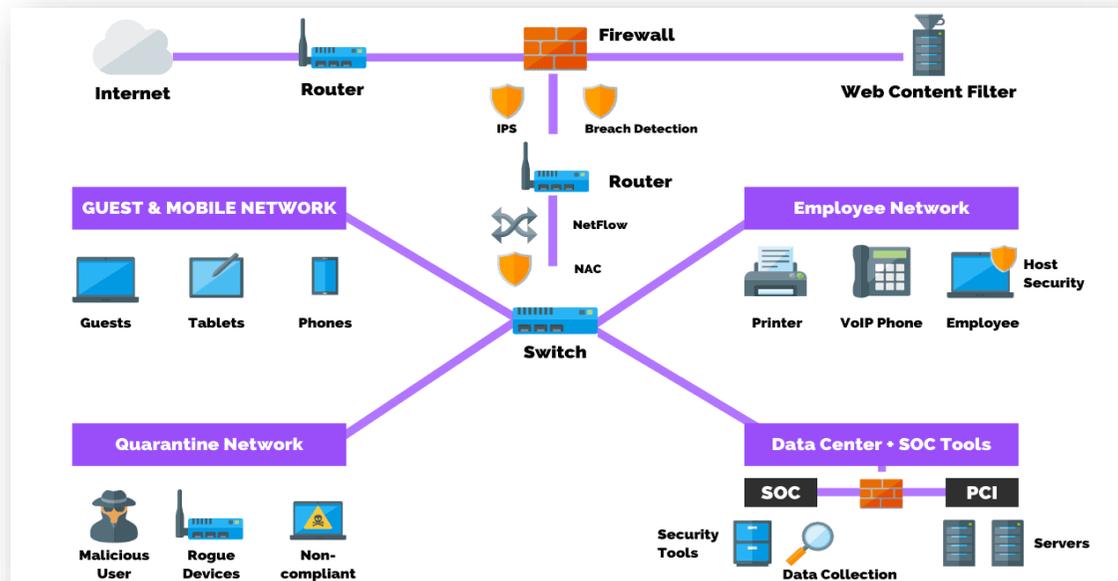
Larger organizations with more mature cyber security programs will also often have dedicated red teams and blue teams that perform exercises to test the effectiveness of their IT security management systems.



In short, blue teams monitor and maintain the defenses of a network and its systems, while red teams simulate real attacks in an attempt to break into

systems either externally or internally. As a result, companies gain a better understanding of the various types of threats that exist.

Finally, the most robust security programs will have a continuous and real-time layer of defence such as a Security Operations Centre (SOC), managed detection and response (MDR), or active threat hunting and analysis.



➔ **4.2 Top 10 Cyber Crime Prevention Tips:**

1. Use Strong Passwords:

Use different user ID / password combinations for different accounts and avoid writing them down. Make the passwords more complicated by combining letters, numbers, special characters (minimum 10 characters in total) and change them on a regular basis.

2. Secure your computer:

- **Activate your firewall**

Firewalls are the first line of cyber defense; they block connections to unknown or bogus sites and will keep out some types of viruses and hackers.

- **Use anti-virus/malware software**

- Block spyware attacks**

Prevent spyware from infiltrating your computer by installing and updating anti-spyware software.

3. Be Social-Media Savvy:

Make sure your social networking profiles (e.g. Facebook, Twitter, Youtube,

MSN, etc.) are set to private. Check your security settings. Be careful what information you post online. Once it is on the Internet, it is there forever!

4. **Secure your Mobile Devices:**

Be aware that your mobile device is vulnerable to viruses and hackers. Download applications from trusted sources.

5. **Install the latest operating system updates:**

Keep your applications and operating system (e.g. Windows, Mac, Linux) current with the latest system updates. Turn on automatic updates to prevent potential attacks on older software.

6. **Protect your Data:**

Use encryption for your most sensitive files such as tax returns or financial records, make regular back-ups of all your important data, and store it in another location.

7. **Secure your wireless network:**

Wi-Fi (wireless) networks at home are vulnerable to intrusion if they are not properly secured. Review and modify default settings. Public Wi-Fi, a.k.a. “Hot Spots”, are also vulnerable. Avoid conducting financial or corporate transactions on these networks.

8. **Protect your e-identity:**

Be cautious when giving out personal information such as your name, address, phone number or financial information on the Internet. Make sure

that websites are secure (e.g. when making online purchases) or that you've enabled privacy settings (e.g. when accessing/using social networking sites).

9. Avoid being scammed:

Always think before you click on a link or file of unknown origin. Don't feel pressured by any emails. Check the source of the message. When in doubt, verify the source. Never reply to emails that ask you to verify your information or confirm your user ID or password.

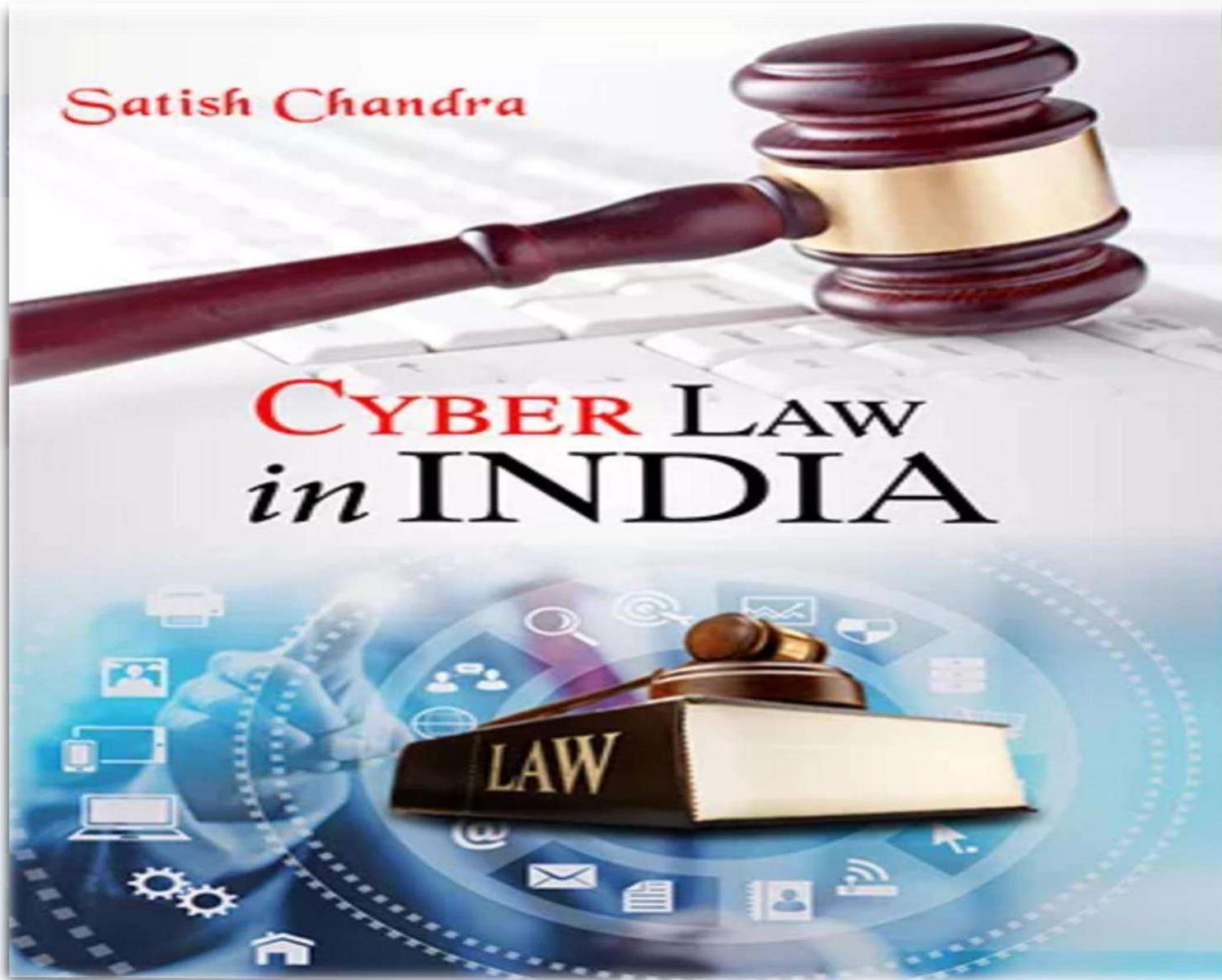
10. Call the right person for help:

Don't panic! If you are a victim, if you encounter illegal Internet content (e.g. child exploitation) or if you suspect a computer crime, identity theft or a commercial scam, report this to your local police. If you need help with maintenance or software installation on your computer, consult with your service provider or a certified computer technician.

CHAPTER 5

Satish Chandra

CYBER LAW *in* INDIA



Cyber laws in india

Cyber Laws in India The United Nations Commission on International Trade Law embraced the model law on e-Commerce to spearhead legal uniformity globally in 1996. The General Assembly of the UN-endorsed this model law as the backbone of the cyber laws of different countries. Soon, India became the 12th country to legitimize cyber regulations. Post the initial draft created by the e-Commerce Act led by the Ministry of Commerce in 1998; the revised Information Technology Bill was passed in May 2000. Finally, things came under control, with the inception of the Information Technology Act, back in October 2000. This Act intricately traced each trifling activity or transaction on the internet, cyberspace, and the World Wide Web. Each minuscule action, as well as its reaction in the global cyberspace, imposed severe legal implications and penalty angles. The Act swiftly amended the traditionally-set Indian Penal Code 1860, the Bankers' Books Evidence Act 1891, the Indian Evidence Act 1872, and the Reserve Bank of India Act 1934. These amends aimed to tone up all electronic transactions/communications bringing them under the radar by granting strict legal recognition. One significant step towards this was accepting digital signatures as legal authentication. This had far broader ambitions covering other tech-driven authentication forms like bio-metrics. Further, the popularity of electronic

fund transfers and electronic data storage attested to the need and success of the futuristic vision behind the IT Act.

➔ **5.1 Regulatory Framework of Cyber Security Laws:**

There are five predominant laws to cover when it comes to cyber security: Information Technology Act, 2000 The Indian cyber laws are governed by the Information Technology Act, penned down back in 2000. The principal impetus of this Act is to offer reliable legal inclusiveness to e-Commerce, facilitating registration of real-time records with the Government. But with the cyber attackers getting sneakier, topped by the human tendency to misuse technology, a series of amendments followed. The ITA, enacted by the Parliament of India, highlights the grievous punishments and penalties safeguarding the e-governance, e-banking, and e-commerce sectors. Now, the scope of ITA has been enhanced to encompass all the latest communication devices. The IT Act is the salient one, guiding the entire Indian legislation to govern cyber crimes rigorously: Section 43 - Applicable to people who damage the computer systems without permission from the owner. The owner can fully claim compensation for the entire damage in such cases. Section 66 - Applicable in case a person is found to dishonestly or fraudulently committing any act referred to in section 43. The imprisonment term in such instances can mount up to three years or a fine of up to Rs. 5 lakh. Section 66B

- Incorporates the punishments for fraudulently receiving stolen communication devices or computers, which confirms a probable three years imprisonment. This term can also be topped by Rs. 1 lakh fine, depending upon the severity. Section 66C - This section scrutinizes the identity thefts related to imposter digital signatures, hacking passwords, or other distinctive identification features. If proven guilty, imprisonment of three years might also be backed by Rs.1 lakh fine. Section 66 D - This section was inserted on-demand, focusing on punishing cheaters doing impersonation using computer resources. Indian Penal Code (IPC) 1980 Identity thefts and associated cyber frauds are embodied in the Indian Penal Code (IPC), 1860 - invoked along with the Information Technology Act of 2000. The primary relevant section of the IPC covers cyber frauds: Forgery (Section 464) Forgery pre-planned for cheating (Section 468) False documentation (Section 465) Presenting a forged document as genuine (Section 471) Reputation damage (Section 469) Companies Act of 2013 The corporate stakeholders refer to the Companies Act of 2013 as the legal obligation necessary for the refinement of daily operations.

➔ **5.2 Penalties:**

Because there are numerous different types of computer and internet crimes, there are also a wide range of potential penalties. Some computer crimes have minor penalties

associated with them, while more serious crimes can impose significant fines and lengthy prison sentences.

- **Fines**: Fines for a conviction of various computer and internet crimes range widely. A misdemeanor conviction can result in relatively minor fines of a few hundred dollars, and possibly up to a \$1,000 or more, while felony convictions can have fines that exceed \$100,000.
- **Jail or prison**: A person convicted of certain internet or computer crimes may also face a jail or prison sentence. The most serious crimes, such as possessing child pornography, can result in a prison sentence of 20 years or more.
- **Probation**: Probation sentences for computer crimes are also possible as either individual penalties or in addition to jail or fines. Probation terms can differ widely, but typically last at least one year and require the person on probation to not commit more crimes, maintain employment, report to a probation officer, and pay all court costs and fines.



CHAPTER 6

CONCLUSIONS & RECOMMENDATIONS

➔ 4.1 Conclusions :

In India, there is no doubt that a good number of people have turned the ethical use of information and communication technologies into unethical activities. This problem is not peculiar to India alone, but it is a problem worldwide and that is why it becomes imperative that organizational data /information must be safeguarded especially these days that almost every business is on line. Our investigation on cybercrimes we observed its threat to the economy of a nation and even peace and security. Therefore there is need for a holistic approach to combat these crimes in all ramifications. Our proposal therefore is the need for cyber police who are to be trained specially to handle cybercrimes in India. In addition, the police should have a Central Computer Crime Respo

nseWing to act as an agency to advise the state and otherinvestigative agencies to guide a nd coordinate computercrime investigation. We are also proposing that the countryshou ld set up National Computer Crime Resource Centre, abody, which will comprise exp erts and professionals toestablish rules, regulations and standards of authentication of each citizen’s records and the staff of establishments andrecognized organization , firms, industries etc.Forensicscommission should be established, which will beresponsib le for the training of forensics personnel/lawenforcement agencies. Above all, comprehen sive law tocombat computer and cyber related crimes should bepromulgated to fight this phenomenon —to a halt. Ourproposal on the nature of law to combat cybercrime is not included in this paper. We recommend that before anybodyenters into any kind of financi al deals with anyone throughthe internet he/she should use any of the search engines toverify the identity of the unknown.

➔ **4.2 Recommendations:**

- Consumer protection must be a key focus of the 2020 cyber security strategy.

- The 2020 cyber security strategy must be clearly outline the responsibilities of governments in industry in relation to identifying and minimising the risk of cyber threats to consumers.
- The cyber security strategy must be future- focussed and adaptable to emerging technologies and associated cyber threats.
- The 2020cyber security strategy must call for an appraisal of core school curriculums to consider the extent to which cyber security education is embedded into all levels of schooling.
- The 2020 cyber security strategy must assign responsibility to industry for providing information to consumers about the security features of connected devices.

- The 2020 cyber security strategy must fund an accessible and inclusive cyber safety consumer education campaign ,to be provided in a range of formats, to inform the general public about cyber security and how to safely navigate the online environment.

CHAPTER 7

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**(Submitted for the Degree of M.Com. in Accounting &
Finance under the West Bengal State University)**

***RETAIL SECTOR-ONLINE MARKET:
FLIPKART***

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CHAPTER 1: INTRODUCTION

1.1 Definition: Online Shopping

Online shopping involves purchasing products or services over the Internet. Online shopping is done through an online shop, e-shop, e-store, virtual store, webshop, Internet shop or online store. All the products in online stores are described through text, with photos and with multimedia files. Many online stores will provide links for extra information about their products. They often make available, safety procedures, instructions, manufacture specification and demonstrations. Some will provide advice or how-to guides. As you are already on the Internet, you can search for product reviews that other consumers may have posted. Some online stores have place for these reviews on their own sites. Many allow users to rate their products. Advice such as this from other consumers, about a product, would be unavailable in a conventional store.

1.2 Advantages of Online Shopping

- **Easy to Find:** Finding a product online is much easier than looking for it in the local store. You can search any product easily by using the search engine feature of an online shopping website. But in store you have to look for it until you find it. Sometime it becomes very annoying when you can't find the product even after looking in the couple of shops. But in online usually we don't have to face this problem. If you don't find a product than you can switch to a new shopping website without wasting your time. For example if you don't find the suitable product in E-bay, you can look for it in the Amazon without wasting your time. On the other hand if you do not find any product in the store you have to go to other store which is more laborious and time consuming.
- **Products can be cheaper:** Sometime a product can be much cheaper in another country than your country. In this case it would be wise to shop online to save some money .Here is my story, I had a big problem with the air flow sensor of my car. I went to the dealer, and they asked 700\$ for a new air flow sensor. Since my car is old, I am never going to spend that much money for that sensor. I did not have time and patience to look for a spare part from the junk yard. Then an idea popped into my head! I took out the part number and searched it on E-bay, and found plenty of used parts with a very cheap price. I bought the

part and so far my car is running great. I am very thankful to god for creating such an easier way of shopping.

- **Save time and energy:** You don't have to waste your time in going to store and standing in front of the crowd. Who likes to search a product in the every corners of a shop and stand in the long line for paying the bill? Shopping from the local store becomes more time consuming and expensive if you do not have a car of your own. You can solve all the above problems just by shopping online.
- **Freedom of choice:** Freedom of choice is very high in online than shopping from a nearby store. In online you can choose the product you are looking, from a vast range of products.
- **Freedom of price flexibility:** You will enjoy the freedom of price flexibility. If you don't like the price of a product from an online shop, you can switch to other online to store to look for cheaper price. You can also follow this procedure in normal shop, but it would take more time and energy to do so.
- **High satisfaction percentage:** Now a day, shopping online is very reliable. The percentage of satisfaction is very high. This is why you would see most of the seller has 99%+ positive feedback.
- **Buyer protection:** Dependable websites like E-bay provides buyer protection to motivate people to buy from their site. This highly trusted websites will give your money back if any seller do not deliver the item or deliver an item which does not match with the description.
- **Rare products:** Shopping online is very useful in buying rare products. For example, Few days ago I have bought a rare car part through E-bay. The price of the part was very affordable too.
- **Privacy:** There are some products which you don't want to buy publicly. You can buy any kind of product from online web store anonymously to maintain your desired privacy.
- **E-business:** The progress of online business is actually helping million of people. Now people can buy and sell from their home. People who cannot afford to buy or rent a shop, can easily open an online store and sell items from their home. This is playing a very important role in reducing the unemployment rate.

1.3 Disadvantages of online shopping

- **Delay:** The main disadvantage of online shopping is, you cannot receive the product immediately. You have to wait until the product arrives. Sometimes it is better to have an item instantly than keep waiting for it for many days. I would prefer to buy an item instantly if the delivery time is too long.
- **Inferior products:** You don't know about the actual quality of the product. Sometimes the description of the product might be different than the actual product. As a result you might end up with inferior quality product.
- **Shipping Charges:** Shipping charges and shipping delays is one of the biggest disadvantages of shopping online. Items are generally cheaper in online web store. But sometime the addition of shipping charge makes the price similar or more expensive than your nearby local store.
- **Delivery Problems:** Sometime you may face Delivery risk. Delivery risk occurs when the seller fails to deliver the original product or delivers a damaged (inferior/duplicate) product due to shipping problems.
- **Shopaholic:** Since it's very easy to search & purchase different items very easily and quickly from online, many people ends up being a online shopaholic. That means they buy too many things they actually don't need. Sad to say, I think I am one of them! Online Shopaholic people thinks they are saving money because the cost is very low when you shop from online, but sometime it's actually a waste because you don't need them. So, buy smart!
- **Scams:** As online shopping is becoming very common the number of online scam and fraud is also increasing. This is why a buyer should always buy from trusted websites only because trusted websites would take care of any fraud to maintain their reputation.
- **Some items are better to buy from the real Store:** You wouldn't like to buy any clothing products because you won't be able to know whether they are going to look good on you or not.
- **Return problems:** Returning an item is difficult in case of online shopping. Although seller accepts sells return, they usually want the item within a short period of time and you also have to pay for the shipping charges.
- **Warranty issues:** Many electronic items are sold without international warranty. So make sure you contact with the seller to verify whether the item has international warranty or not.

CHAPTER 2: OBJECTIVES & METHODOLOGY

2.1 Objectives :

- To understand the concept of online shopping in India and what are its recent trends.
- To identify the major market players in terms of online shopping and conducting a comparative study.
- To understand the notion of online shopping with respect to male-female preference - a case study of Flipkart.

2.2 Methods :

Primary data: Primary research consists of a collection of original primary data collected by the researcher. It is often undertaken after the researcher has gained some insight into the issue by reviewing secondary research or by analyzing previously collected primary data. It can be accomplished through various methods, including questionnaires and telephone interviews in market research, or experiments and direct observations in the physical sciences, amongst others.

Secondary data: Secondary data is data collected by someone other than the user. Common sources of secondary data for social science include censuses, organizational records and data collected through qualitative methodologies or qualitative research. Primary data, by contrast, are collected by the investigator conducting the research.

This study has been conducted based on both primary and secondary data sources, where the information regarding the generalized idea about online shopping and the company profile is based on secondary sources as obtained from company website and various articles. However the authentication of such information is difficult to judge. The information regarding the customer awareness has been collected by employing primary method, where 20 respondents (10 male and 10 female) were interviewed.

CHAPTER 3: MARKET TREND ANALYSIS

3.1 Market Scenario of Online Shopping

India's e-commerce market grew at a staggering 88 per cent in 2013 to \$ 16 billion, riding on booming online retail trends and defying slower economic growth and exponentially increasing inflation.

According to the survey, India's e-commerce market, which stood at \$2.5 billion in 2009, reached \$8.5 billion in 2012 and rose 88 per cent to touch \$16 billion in 2013. The survey estimates the country's e-commerce market to reach \$56 billion by 2023, driven by rising online retail.

To make the most of increasing online shopping trends, more companies are collaborating with daily deal and discount sites, the survey pointed out.

India has Internet base of around 150 million as of August, 2013, the survey said.

Having close to 10 per cent of Internet penetration in India throws a very big opportunity for online retailers to grow and expand as future of Internet seems very bright.

- **Product Trend Analysis:** Besides electronics gadgets, apparel and jewellery, home and kitchen appliances, lifestyle accessories like watches, books, beauty products and perfumes, baby products witnessed significant upward movement in last one year. The products that are sold most are in the tech and fashion category, including mobile phones, I-pads, accessories, MP3 players, digital cameras and jewellery, among others, it found.
- **Location Trend Analysis:** As per responses by 3,500 traders and organized retailers in Delhi, Mumbai, Chennai, Bangalore, Ahmadabad and Kolkata who participated in the survey, online shopping grew at a rapid pace in 2013 due to aggressive online discounts, rising fuel prices and availability of abundant online options. Among the cities, Mumbai topped the list of online shoppers followed by Delhi, while Kolkata ranked third, the survey found.
- **Age-Wise Analysis:** The age-wise analysis revealed that 35 per cent of online shoppers are aged between 18 years and 25 years, 55 per cent between 26 years and 35 years, 8 per cent in the age group of 36-45 years, while only 2 per cent are in the age group of 45-60 years. Besides, 65 per cent of online shoppers are male while 35 per cent are female.

3.2 Comparison between the Market Rulers in India

3.2.1 Introduction to the Market Rulers

Flipkart.com, Ebay.in and Amazon.in are the three online biggies currently fighting it out to gain the maximum number of online shoppers in India. The three websites have acquired muscles and artillery for the battle in form of investments, which they are currently making and will be making in the future. An outright comparison without mentioning how these websites started and what they went through before reaching where they are would be unfair. Let's have a look at how these websites came in to existence and where they stand today.

- ***Flipkart.com***

Flipkart.com was founded by Sachin Bansal and Binny Bansal in 2007 as an online retail portal selling books. The company soon expanded into all verticals of online retailing and strengthened itself by acquiring the online electronics retailer Letsbuy.com in 2012. The company has gained a secured footing in India over the years and recently became the first online retailer in India to cross the GMV figure of \$1 billion in March 2014, beating its own expectation of crossing that mark in 2015. It is also the most visited online retailer in India and the brand has a highest recall value among online shoppers.

- ***Ebay.in***

Ebay.in is an online marketplace that lets buyers meets sellers; the company was founded in 1995 in America and distinguishes itself as being „internet consumer to consumer corporation.“ The company operates localized portals in 30 countries of the world. Ebay.in started operations in 2005 and has continuously built a regular set of buyers and sellers on the website. Since the company operates as a marketplace it allows sellers to list their products either at a fixed price or have an auction for their products. The company offers buyers „eBay guarantee“ so they can be secured that they get only genuine products.

- ***Amazon.in***

Amazon is the world's largest online retailer. The company was founded in 1994 by Jeff Bezos. The company operates different portals for different countries and „Amazon.in“ is the one that operates in India. Apart from being a retailer, Amazon is also a technology company and created „Kindle“ which is an eBook reader for customers who download digital books from the website. Amazon was a late entrant in India and has to make it mark among Indian audience.

3.2.2 Flipkart.com vs Ebay.in vs Amazon.in

Basis of Distinction	Flipkart.com	Ebay.in	Amazon.in
<ul style="list-style-type: none"> Working Models 	Flipkart.com started as a direct retailer, selling goods directly to consumers and has recently included the marketplace model as well, where sellers can list their products.	Ebay.in has always worked as a marketplace, enabling sellers to meet buyers and the company does not directly retail products.	Amazon has always followed both the models, where it sells products directly and also lets other sellers to sell their goods on its portal.
<ul style="list-style-type: none"> Pricing Policy 	Flipkart.com has fixed price on their products.	Ebay.in allows buyers and sellers to engage in auctions.	Amazon.in has fixed price on their products.
<ul style="list-style-type: none"> Shipping Charges 	On flipkart.com customers don't have to pay any shipping charge if they are buying products above rs.500.	Ebay.in has different shipping charges according to the sellers.	Amazon offers some products with free shipping while others are charged for shipping.
<ul style="list-style-type: none"> Discount Strategy 	Flipkart.com offers between 0-30% discount range spread uniformly.	Ebay.in does not have any specific discount range.	Amazon.in offers between 10-40% discount range spread uniformly.
<ul style="list-style-type: none"> Mode of Payment 	Flipkart mentions cash-on-delivery as a mode of payment, along with credit cards, debit cards and net banking.	On eBay, the cash-on-delivery option is available only if a seller offers it.	Amazon doesn't allow such payments for all items. It also levies a delivery charge.

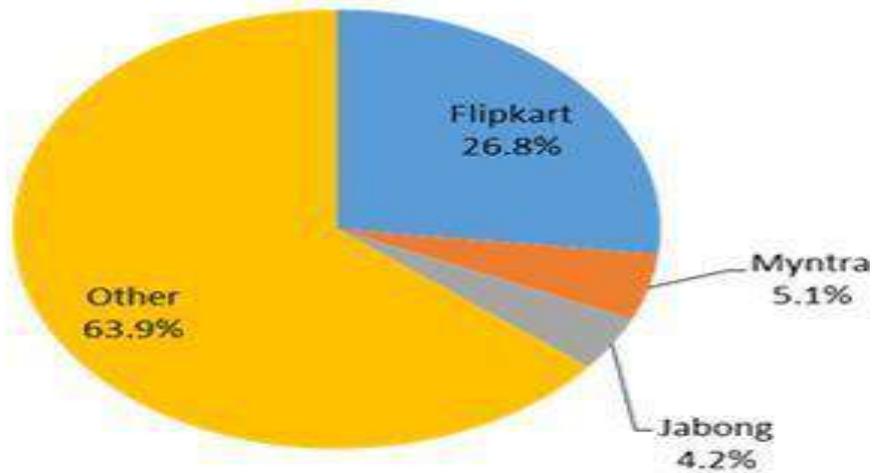
3.2.3 Market Share Analysis

Following FLipkart's & Myntra's recent merger, ecommerce companies Flipkart and Myntra are acquiring and incubating private labels to increase their fashion business. The combined entity is also roping in more international brands and Bollywood celebrities, while increasing the seller base.

It is eyeing a share of about 65 per cent of the online fashion segment in the next 12-18 months. It claims it accounts for half the current market share. Myntra has eight private labels, and it is expected the count might double in a year, though the company did not officially provide any estimate.

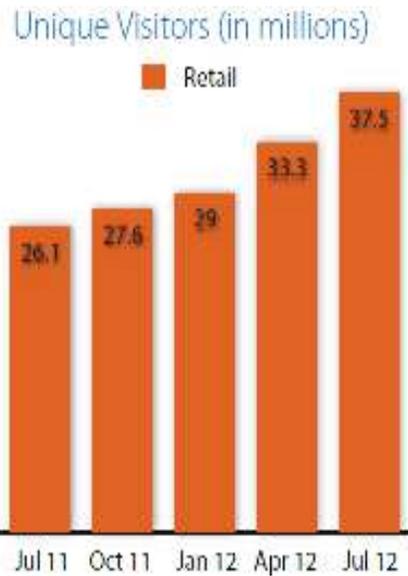
To increase its presence across clothes, footwear and accessories, Flipkart-Myntra is actively considering acquiring some online and offline private labels. It plans to spend about \$100 million in the coming year. "Recently, we set up a fashion incubator, in which 15-20 people will be given support in manufacturing, sampling, supply chain, etc, to grow private labels. After a year, three-four private labels might be acquired by Myntra," said Mukesh Bansal, chief executive of Myntra and head of fashion at both Flipkart and Myntra. Currently, Myntra has about 650 brands on its portal, while Flipkart has a base of about 3,000 sellers.

Market share per provider 2013



Source: <http://india-retail-market-to-reach-2-23-billion-in-2013/>

Flipkart Vs Other Companies



Source : <http://www.iamwire.com/2012/10/india-among-the-fastest-growing-e-commerce-market-a-report/5329>

THE E-TAIL FIGHT

	amazon	flipkart	snapdeal	ebay
Number of products	15 mn	15 mn	5 mn+ *	1.1 mn*
Categories	24	70+	500+	2,000
Sellers	5,000	3,000	100,000	45,000
Time in India	11 months	7 years	4 years	9 years

* Snapdeal's assortment of products is excluding books and movies

* eBay has 1.1 million product listings at any given point

Source: Companies

Source : <http://thetechpanda.com/2014/05/21/flipkart-takeover-myntra/e-tail-fight/>

CHAPTER 4: CASE STUDY



4.1 Case Study of an Emerging Giant in the Online World –FLIPKART

Innovation brings with itself a new set of challenges. The E-Retailing form of market was fairly something unheard of to the Indian consumer in 2007. Flipkart which has carved a niche for itself in terms of market share, goodwill and popularity in the online market to the extent that retailers are coming under threat because of its discounts and smooth operations. Started with an initial capital of four lakhs it now aims for annual turnover of around Rs.4500 crores. It started off with books and later on started diversifying its market into apparel, electronics, softwares, music, etc. With over seventeen and a half million book titles listed, eighteen different categories, more than four million registered users and sale of fifty-five thousand items a day it's quite a sensation in today's online market. Moreover with such a large area to cover distribution and operational challenges crop up. Another challenge was online payment which the consumers were hesitant to make. Flipkart came up with their unique policy of Cash-On-Delivery. This case study aims to understand the functioning of Flipkart, its methods of operations, distribution, warehousing and delivery systems. The ascent of Flipkart to capture the online market in India in just four years, the strategies implemented by it to create online business ,its ability to stand out among numerous E-Retail

sites. What has Flipkart got that makes its model so robust? It aims to predict the future roadmap and also aims to find significant threats to Flipkart in the near future.

Flipkart went live in 2007 with the objective of making books easily available to anyone who had internet access. Today, they're present across various categories including movies, music, games, mobiles, cameras, computers, healthcare and personal products, home appliances and electronics, stationery, perfumes, toys, apparels, shoes – and still counting! Be it their path-breaking services like Cash on Delivery, a 30-day replacement policy, EMI options, free shipping - and of course the great prices that they offer, everything they do revolves around their obsession with providing their customers a memorable online shopping experience. Then there's their dedicated Flipkart delivery partners who work round the clock to personally make sure the packages reach on time. So it's no surprise that they're a favorite online shopping destination. One of the biggest names in the Online Retail Industry and a Leading e-Commerce player in the Country; Founded by Sachin Bansal & Binny Bansal in Bangalore, Karnataka in 2007. Which was started with initial capital of INR 4 lakh contributed by the founders, 7 warehouses, offices and delivery centers across India. With over 17.5 million book titles listed, 16 different categories, more than 4 million registered users and sale of 55000 items a day their operations are simply huge. Had 8600+ employees till December 2013. Had a massive Revenue of around 1200 Crores (FY 2012-13) and plans to reach 2500 Crores this year. They worked for Amazon.com before quitting and founding their own company. Initially they used word of mouth marketing to popularize their company. A few months later, the company sold its first book on flipkart.com - John Wood's Leaving Microsoft to Change the World. Flipkart broke even in March 2010 and claims to have had at least 100% growth every quarter since its founding. The store started with selling books and in 2010 branched out to selling CDs, DVDs, mobile phones & accessories, cameras, computers, computer accessories and peripherals, pens & office supplies, other electronic items such as home appliances, kitchen appliances, personal care gadgets, healthcare products etc.

Flipkart aims at 10 times growth and eyes at \$ 1 Billion sales by 2015. They will look at bigger investments in their supply chain and technology. Investment will be made in large warehouses and increased automation of their process, so that the product is not delayed. They intend to enter in to various new categories and expand their current categories as well. Everything except for groceries and automobiles will be available on Flipkart in future. To go further in the value chain, Flipkart is looking at associations with a larger number of suppliers and partners, both nationally and internationally. Flipkart, the first billion dollar Online Company from India (going by 2015 estimates) is by far the leading online store in the nation. Now that Amazon is reportedly entering India in early 2014, this news becomes even more significant, considering that Amazon has previously, and unsuccessfully, tried acquiring the company, with Flipkart demanding a very high buyout price.

4.2 Company Profile

Flipkart, which began in 2007 is now as per Alexa traffic rankings, among the top 30 Indian web sites and has been credited with being India's largest online bookseller. In 2010 they branched out to selling CDs, DVDs, mobile phones & accessories, cameras, computers, computer accessories and peripherals, pens & office supplies, other electronic items such as home appliances, kitchen appliances, personal care gadgets, health care products etc. Flipkart has over 2 million registered users and ships more than 30,000 items per day. The advantages of becoming one of the most popular e-commerce websites and thus generating more traffic and revenue through transactions are countered by the disadvantage that Flipkart is now a recognizable target for hackers.

4.2.1 Funding

- Initially funded by the Bansals themselves with 4 Lakhs (INR).
- Flipkart has since then raised two rounds of funding from venture capital funds Accel India (in 2009) and Tiger Global Management (up to the tune of US\$10 million) (in 2010).
- Private equity firms Carlyle and General Atlantic are in talks to jointly invest about \$150 million to \$200 million in Flipkart, according to sources.

4.2.2 Flipkart's Success Mantra

- Great customer service: Flipkart users are more satisfied than that of their competitors. Great customer service has been its hallmark.
- Easy to use website, hassle free payment system: The user interface is sleek and easy to use.
- Cash on delivery/Card on delivery mode of payment: This has been a major instrument in Flipkart's success. Almost 60% of its sales happen through this mode. Cash on delivery created trust in the minds of Indian customers who were always weary of making payments online.
- Focused on user experience: Every other e-commerce site, tried to cram the maximum of amount of information possible into every single page whereas Flipkart focused on providing only the relevant info

4.2.3 Future Road Map

- They aim at 10 times growth and eyes at \$ 1Billion sales by 2015.

- They will look at bigger investments in their supply chain and technology.
- Investment will be made in large warehouses and increased automation of their process, so that the product is not delayed.
- They intend to enter in to various new categories and expand their current categories as well.
- Everything except for groceries and automobiles will be available on Flipkart in future.
- To go further in the value chain, Flipkart is looking at associations with a larger number of suppliers and partners, both nationally and internationally.

4.2.4 Threats in future

There are no major foreseeable threats in the future. The company has built a great brand name, they just have to maintain and enhance the same. Need to keep introducing more products, adapting to the changing needs of the customer with time. The entry of Amazon.com in 2012 in the Indian e-commerce space has been cited as a big challenge to Flipkart. However Flipkart is a respected Brand name in India and should be able to compete with Amazon. Amazon being a very big company can bring in serious competition to Flipkart, since Amazon can bear more losses in the beginning to gain customer base. But again Indian market is growing at a rapid pace as access to internet increases and people become more aware of e-commerce sites and start trusting the same; hence Indian market is sufficiently big at-least for these two giants to co-exist beneficially.

4.3 Secondary Data Analysis

4.3.1 Promotion strategy

- ***Advertisements Used in Newspapers and Magazines***

Newspaper advertising works on the fundamental of building trust and confidence with the readers.

Newspapers have the greatest impact because of the following reasons:

Experts say the greater the exposure of the advertisement, the longer is the period of its impact among the readers. Therefore experts feel if an advertisement stays in the memory of a consumer for a longer time, chances are quite probable that he might opt for purchasing or

availing your services as and when required. This counts for higher sales and brand awareness.

A newspaper reader is so involved in his reading that sometimes the content in the advertisements creates an emotional impact on him. It is this power of being able to evoke an emotional response with the reader that goes in favor of newspaper advertising.

In other media, especially online media, people get perturbed by the distractions in the form of pop-ups and other advertisement forms that keep flashing on and off the screen. In fact experts" points out that instead of having any favorable impact, these ads serve to distract the readers.

However newspapers, point out experts, involves a focused reading where there are no disturbing and unwanted flashes of advertisements. As there is no distance between the reader and the story it seems that the reader actually undergoes all the emotions in the story himself, leading to increase in the trust factor. Taking advantage of this trust quotient, advertisers cash on newspapers to send their messages loud and clear among the readers.

Hence, Flipkart has used advertisements in newspapers and magazines which are colorful, bright; most of the images consist of kids, and have clear messages. Here are some of the advertisements used by Flipkart in Newspapers and Magazines.

- ***Online Advertising***

The number of internet users is on a rapid rise worldwide and is used by people of all age and types. Internet has become a major medium for communication, entertainment and is in the process of replacing traditional entertainment, promo products, and informative Medias. Some businesses are finding that handing out a promo product such as pens, business cards, and mugs are too costly and yield little results. Likewise, traditional marketing forms such as television, radio, newspaper, magazines, etc., are becoming a thing of the past.

Internet has also become a major and effective medium for advertising and it has be predicted that the online advertising and marketing is soon going to replace the advertising through traditional medias such as television, radio, newspaper and magazines. I have picked around 10 advantages of online advertising (not in that order) when compared with the traditional offline advertising.

- i. **Wider Coverage** : The online advertising gives your ads a wider coverage and this globally wider coverage helps in making your advertisements reach more audiences, which may ultimately help you in getting better results through your online advertising campaign.

- ii. **Targeted Audiences** : when compared with offline advertising, online advertising always helps you to reach the targeted audience and this helps in making your campaign more profitable and getting more relevant leads.
- iii. **Affordable** : Another main advantage of online advertising or marketing is the much affordable price when compared with the traditional advertising costs. With a much lesser cost you can advertise on the net for a wider range of audience and geographical locations.
- iv. **Easy to Track and Measure Conversion** : Measurability and easiness to track the conversion makes online advertising miles ahead on the traditional advertising methods. A lot of effective analytics tools are available to measure online advertising campaigns which help in more improvisation of the ads.
- v. **Speed** : Online advertising is much faster than offline advertising and you can start sending out your ads to a wider audience, the moment you start your advertising campaign.
- vi. **Informative** : In online advertising, the advertiser is able to convey more details about the advertisement to the audience and that too at relatively low cost. Most of the online advertising campaigns are composed of a clickable link to a specific landing page, where users get more information about the product mentioned in the ad.
- vii. **Flexible Payment** : Payment flexibility is another added advantage of online advertising and marketing. In offline advertising you need to pay the full amount to the advertising agency irrespective of the results. But in online advertising there is the flexibility of paying for only qualified leads, clicks or impressions.
- viii. **Better ROI** : Since online advertising is mainly focused on performance based payment, you ROI is sure to be far better when compared with offline advertising.
- ix. **Easy Audience Engagement** : Online advertisement makes is easy for the audience to engage with your ads or products. As an advertiser we would be able to get more feedback from the audience and thereby improve the quality of our ads going forward.
- x. **Better Branding** : Any form of advertising helps in improving the branding and online advertising stands a notch high in improving the branding of your company, service or product.

- ***Tweets about Flipkart***

Flipkart stays connected with its users via twitter, they answer most of the queries" put up by their customers and carefully evaluate all the suggestions which were posted in the twitter which keeps the customers happy and in turn keep the management of Flipkart happy.

- ***Big Billion Day Sale***

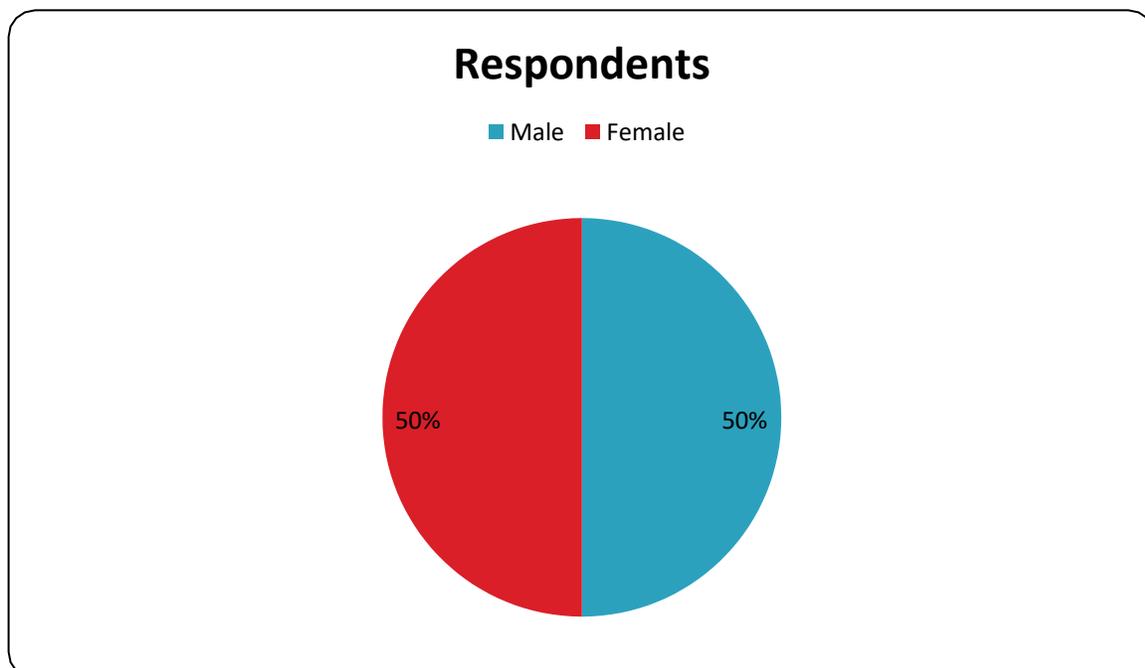
Flipkart aims to do business of more than 1 billion in one day on 6th October 2014. Flipkart has already achieved its sale target by 2pm but most of the deals didnt proceed anymore. At approx. 2pm, seller accounts of third party vendors on Flipkart have been put as pending i.e no more orders had been taken for the day and products were shown the status as 'out of stock'. A few selected deals continud to be listed, but essentially the sale was over.

The main reason behind this move was that Flipkart had already received more than 3,00,000 orders in the first 6 hours of the sale - a number that was the limit of their enormous logistics team to process. They did not risk taking more orders and then fail to process them in dispatch. A wise strategy to avoid bad mouthing on late delivery, however limiting the sale in such a way didl only lead to more complaints from the users.

Throughout the sale, social media was anyway abuzz with complaints against the site crashing and giving errors, orders disappearing from shopper carts and deals going out of stock as soon as they went live. Online shoppers have been continuously checking Flipkart ever hour for new deals and Flipkart didnt inform its users about the sale end.

4.4 Primary Data Analysis & Interpretations

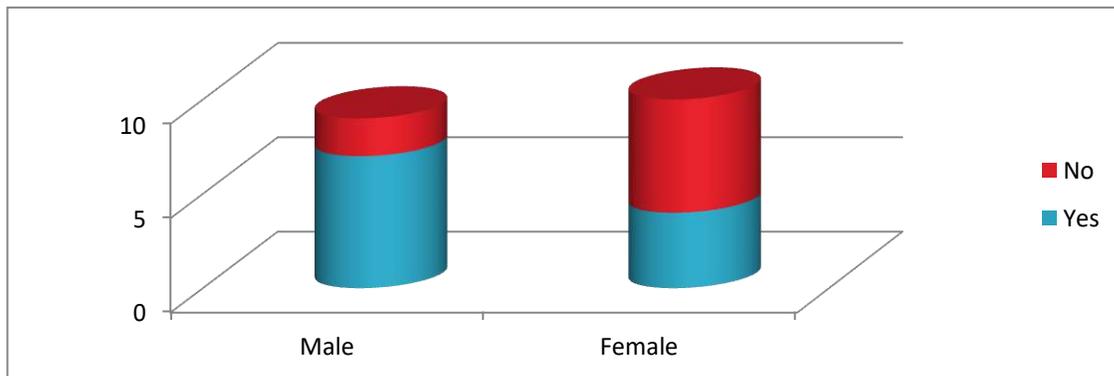
Number of respondents and their distribution



Survey of 20 respondents, where number of female was 10 and that of male were 10.

1. Do you prefer online shopping?

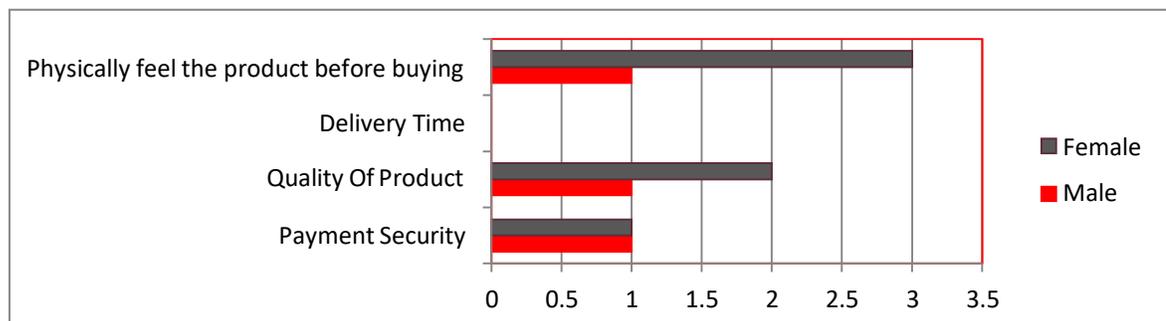
- Yes
- No



The frequency of purchasing online is seen higher in case of male than in case of females because women are more receptive to other people's opinions, make impulse purchases and devote a lot of time to shopping.

2. If 'No' then why?

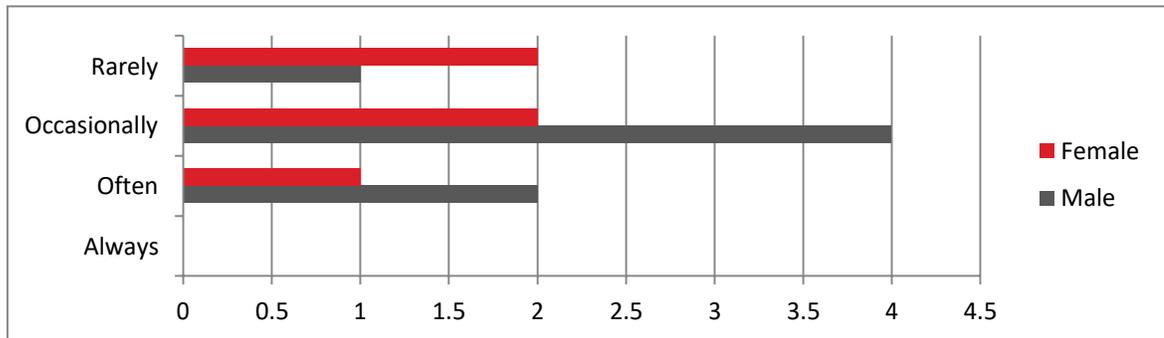
- Security
- Quality of Product
- Delivery Time
- Physically feel the Product before buying



Quality of product, inability to touch or feel the product online and payment of security are the major impediments for both the genders on doing online shopping.

3. If 'Yes' then how often do you purchase?

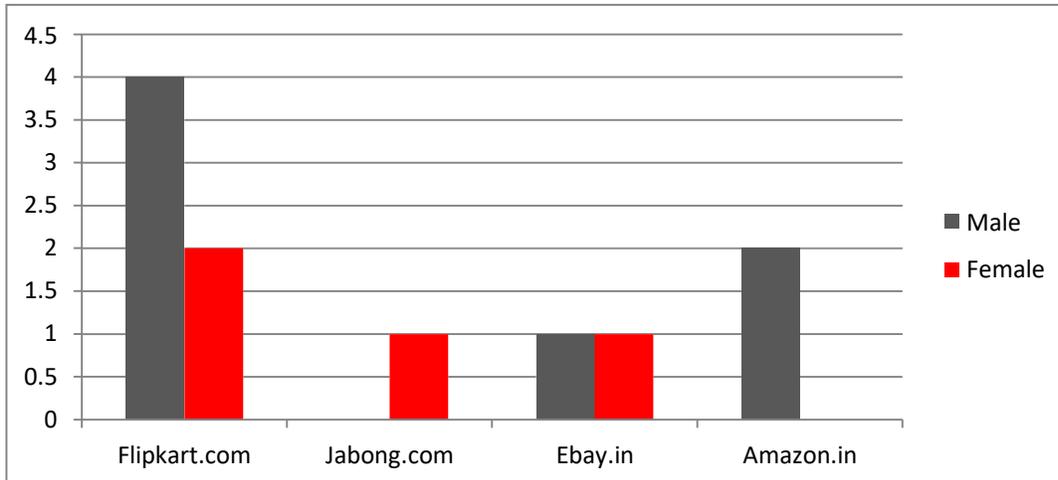
- Always
- Often
- Occasionally
- Rarely



Frequency of purchase done by Male is higher in comparison to female. Most of the males purchase occasionally while most of the females purchase rarely.

4. Do you have any specific online shopping destination?

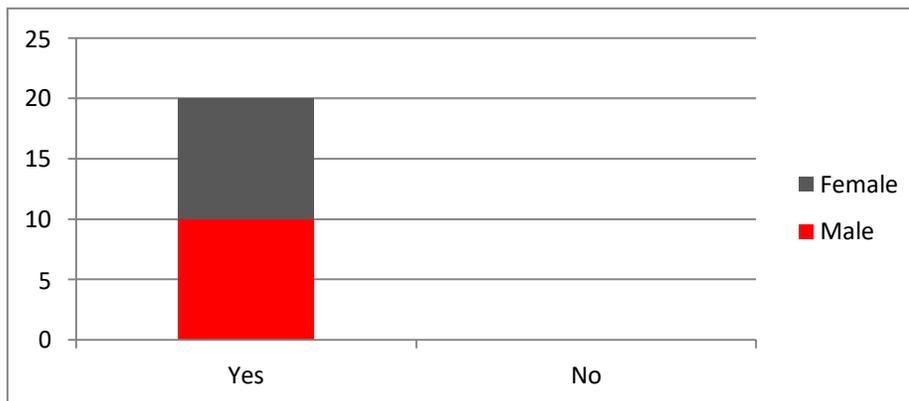
- Flipkart.com
- Jabong.com
- Ebay.in
- Amazon.in



The frequency of purchasing from Flipkart by both males and females is more in comparison to other online shopping sites because the word of mouth strategy by Flipkart is the most successful means of making people aware about them and their products. This success can only be gained through satisfied customers.

5. Have you ever heard about Flipkart?

- Yes
- No

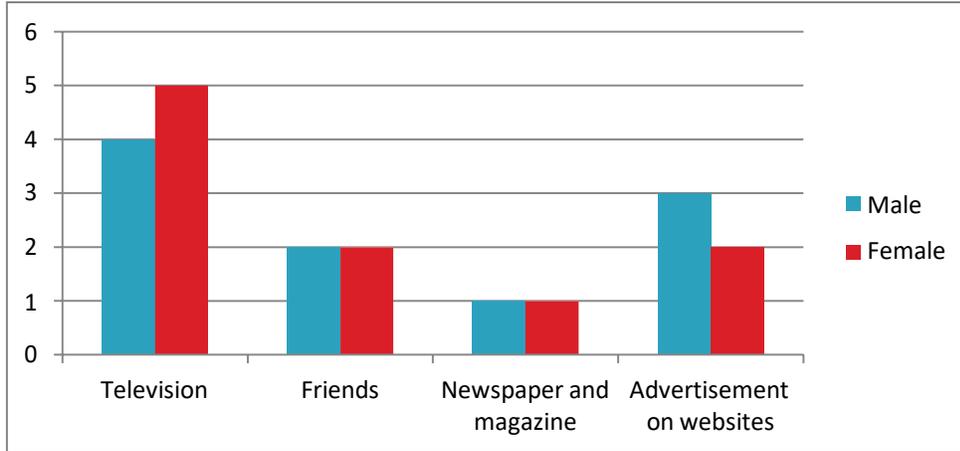


Flipkart has successfully placed itself into the prospects mind making it the India's largest online store with huge range of products.

6. How did you come to know about Flipkart?

- Television
- Friends

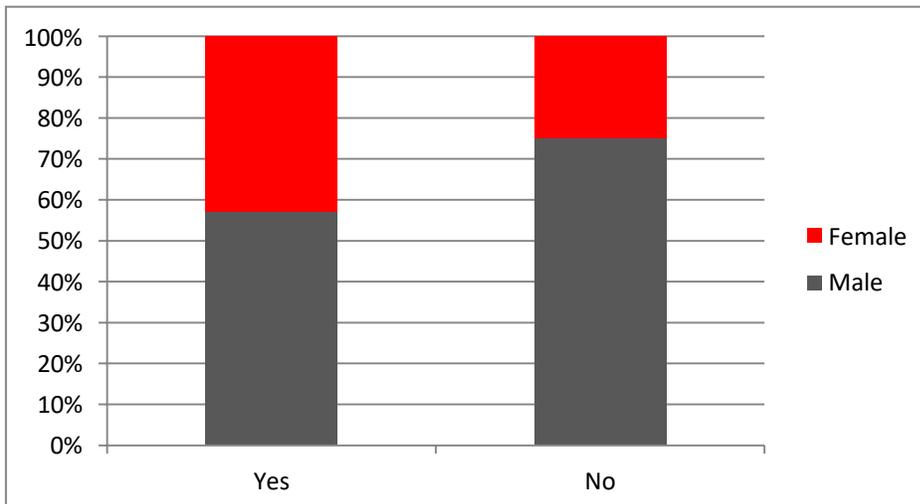
- Newspaper and magazines
- Advertisements on websites



Most of the people came to know about Flipkart through television followed by friends and online advertisements. This proves that word of mouth strategy by Flipkart is the most successful means of making people aware about them and their products. This success can only be gained through satisfied customers who act as advocates for your products.

7. Did you ever make a purchase from Flipkart?

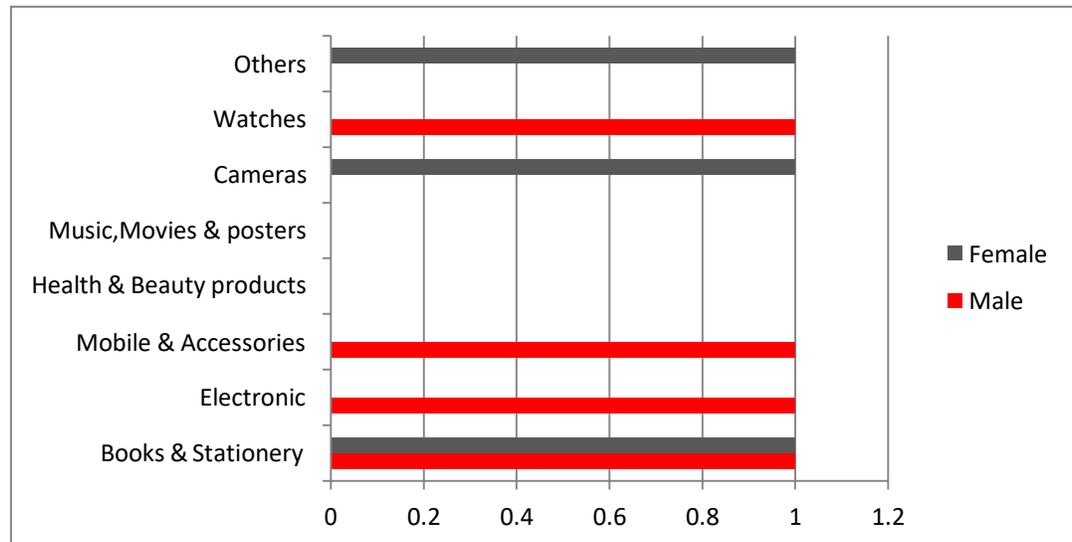
- Yes
- No



Most of the males purchase from Flipkart. The reason is when it comes to purchases, male shoppers just want to get what they need and get it fast. Ease and access are important components for them.

8. What category of products do you purchase from Flipkart?

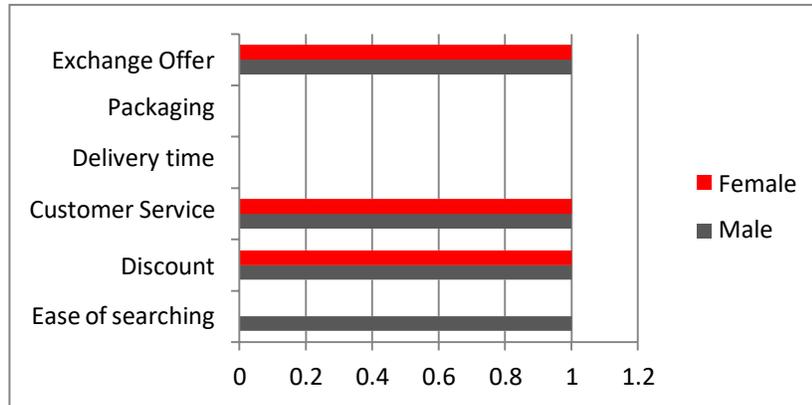
- Books and Stationery
- Electronic Items
- Mobile and accessories
- Health and Beauty products
- Music, movies and posters
- Cameras
- Watches



Males purchase more categories of products than females. Books and stationery, Electronic items, Mobile & accessories, cameras, watches and others (bags, belts, etc.) are purchased more. Books & stationery and electronics items are more famous.

9. Which of the following features do you like about Flipkart?

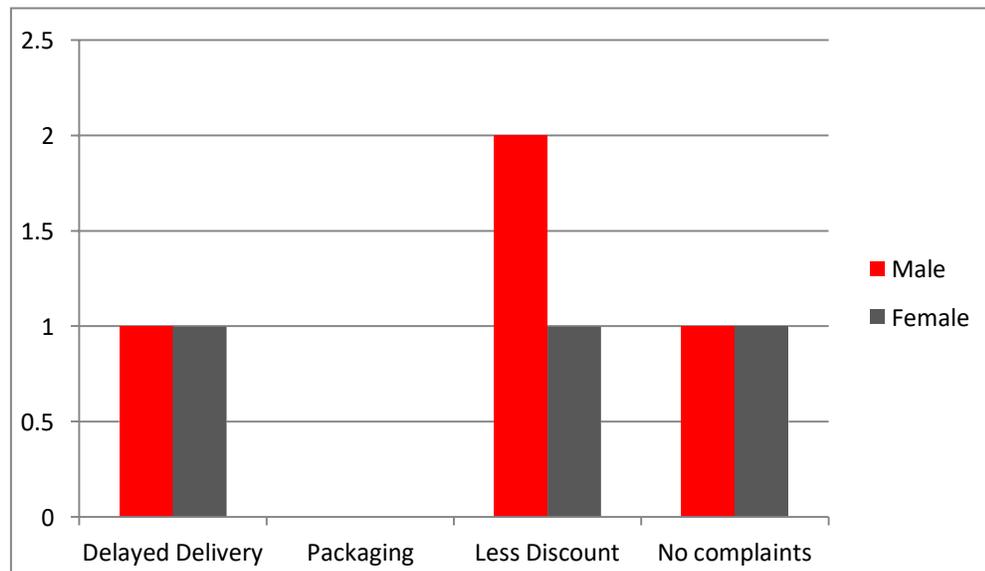
- Ease of searching
- Discount
- Customer service
- Delivery time
- Packaging
- Exchange Offer



Apart from packaging and delivery time; Exchange offer, customer service, discount and ease of searching are the features which the people like about Flipkart.

10. What you don't like about Flipkart?

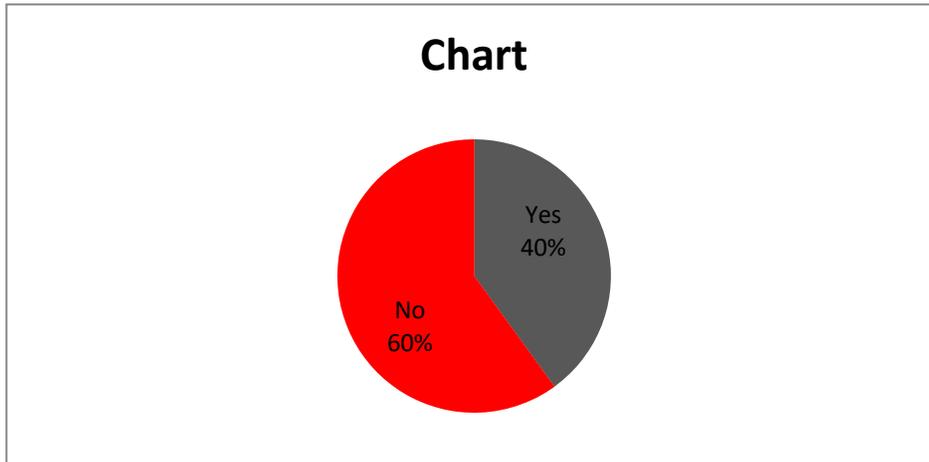
- Delayed delivery
- Packaging
- Less discount as compared to other e-commerce sites
- No complaints



Delayed delivery, less discounts available as compared to other e-commerce sites are the main reasons for disliking Flipkart.

11. Do you prefer online shopping over normal shopping?

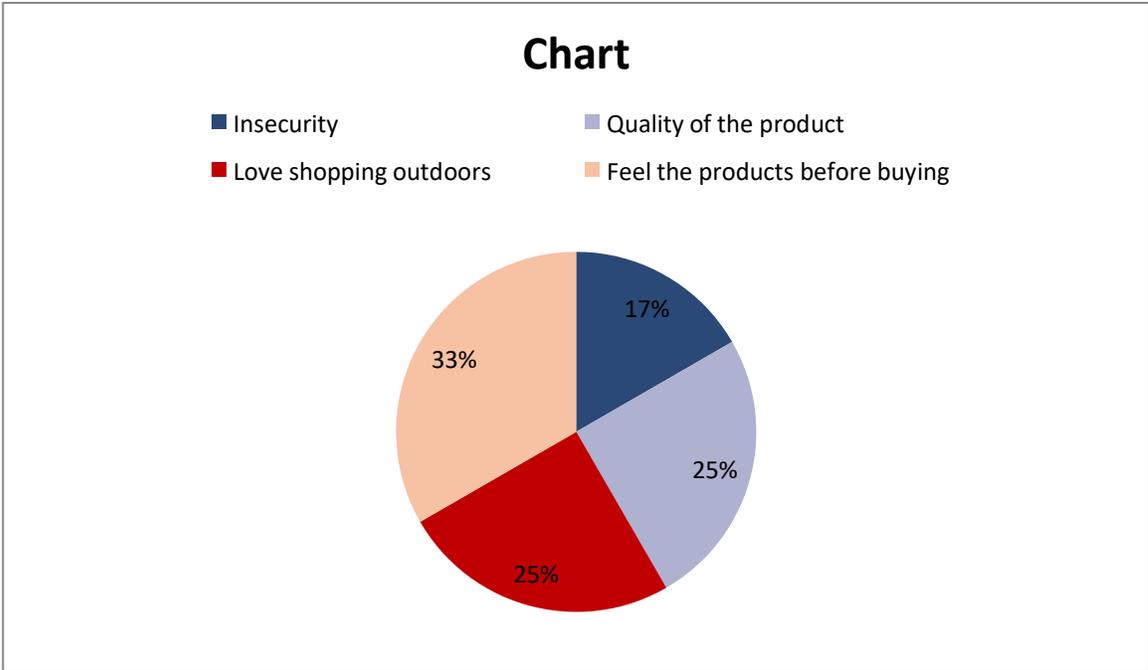
- Yes
- No



60% of the respondents does not prefer online shopping while 40% of the people prefer shopping online rather than shopping outdoors.

12. If No then why?

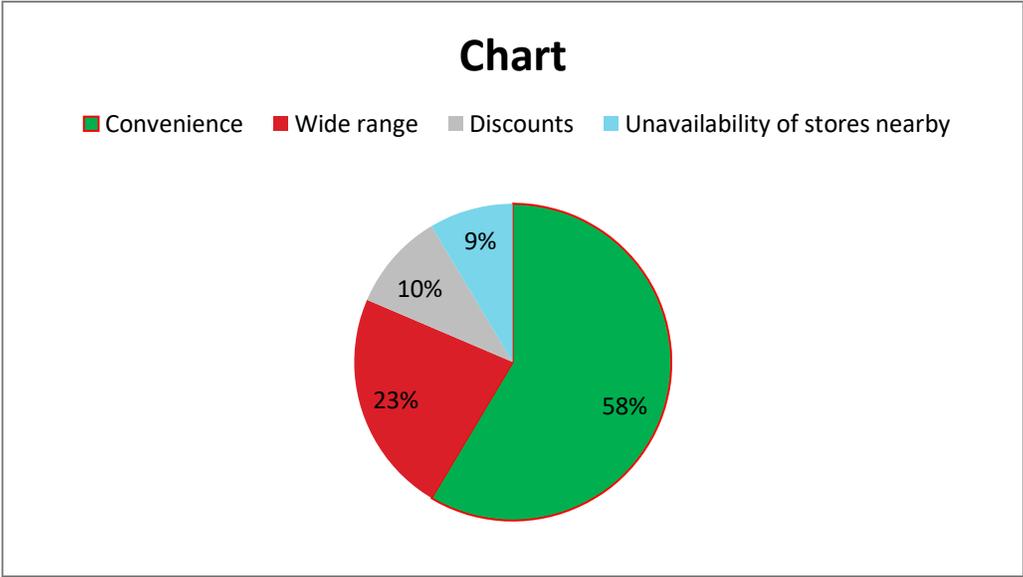
- Insecured about paying online
- Quality of the product
- Love shopping outdoors
- Feel the products physically before buying



Most of the people like to feel the products before buying them. Therefore they prefer buying outdoors.

13. If yes, then why it is preferable?

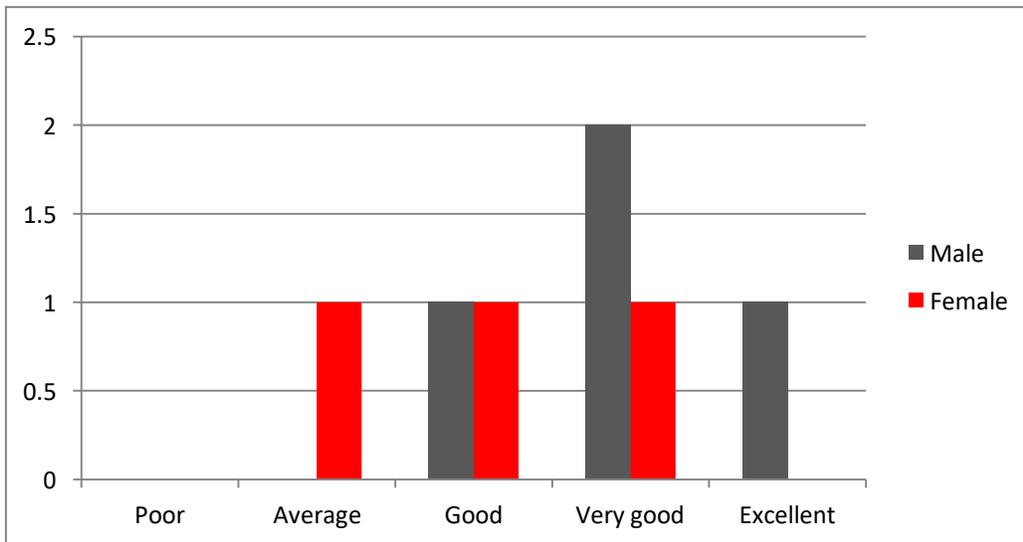
- Convenience
- Wide range available
- Discounts
- Unavailability of stores nearby



Convenience being the main reason why most of them want to buy online. Wide range of products are available online. They can choose whatever they want as per there needs.

14. How do you rate the online shopping experience from Flipkart?

- Poor
- Average
- Good
- Very good
- Excellent



The overall experience from Flipkart is shown above.

CHAPTER 5 : CONCLUSION

The founders of Flipkart have probably conquered their dreams with the amazing success of Flipkart. Flipkart is something which has really opened up the Indian e-commerce market and that also in a big way.

It was never going to be easy since India has had bad past experiences with e-commerce trading. It was not an easy segment to break into, people were very particular in paying money for something which they had not seen and received. The trust was missing in the Indian customers. So what Flipkart had to do was to instill trust and faith in their customers. And they did exactly the same.

Flipkart began with selling books, since books are easy to procure, target market which reads books is in abundance, books provide more margin, are easy to pack and deliver, do not get damaged in transit and most importantly books are not very expensive, so the amount of money a customer has to spend to try out one's service for one time is very minimal. Flipkart sold only books for the first two years.

The company has built a great brand name, they just have to maintain and enhance the same. Need to keep introducing more products, adapting to the changing needs of the customer with time. The entry of Amazon.com in 2012 in the Indian e-commerce space has been cited as a big challenge to Flipkart. However Flipkart is a respected Brand name in India and should be able to compete with Amazon. Amazon being a very big company can bring in serious competition to Flipkart, since Amazon can bear more losses in the beginning to gain customer base. But again Indian market is growing at a rapid pace as access to internet increases and people become more aware of e-commerce sites and start trusting the same; hence Indian market is sufficiently big at-least for these two giants to co-exist beneficially.

Findings

- Frequency of purchase is more among Men.
- Word of mouth was more influential in promotion as many people were made aware by their friends.
- Most of the people are satisfied with the services of flipkart and are willing to recommend them to make purchases from flipkart.
- Except packaging and warranty, all others are considered important in the decision making of online purchases.
- Almost all the factors that Flipkart is focusing onto are of high importance to the people.
- The commercials used by Flipkart are effective enough to convey the message since the ads are interesting enough to gain attention and position itself into the prospects mind.

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- www.facebook.com/flipkart
- www.hindustantimes.com/technology/industrytrend/how-flipkart-broke-indias-online-shopping-inertia/so-article1-780440.aspx
- Images from Google Images.com
- Commercials from Youtube.com

ANNEXURE

Student's Declaration

I hereby declare that the Project Work with the title RETAIL SECTOR-ONLINE SHOPPING : FLIPKART submitted by me for the partial fulfilment of the degree of M.Com. in Accounting & Finance in Business under the West Bengal State University is my original work and has not been submitted earlier to any other University /Institution for the fulfilment of the requirement for any course of study.

I also declare that no chapter of this manuscript in whole or in part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the references.

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SEMESTER: IV

SUBJECT: PROJECT REPORT AND MANAGEMENT

SUBJECT CODE: MC 405

IMPACT OF COVID-19

ON INDIAN HAND

SANITIZER MARKET



PROJECT REPORT

Submitted for the degree of M.com under the West Bengal State
University.

IMPACT OF COVID-19 ON INDIAN HAND SANITIZER

Submitted By:

Somali Mondal

REGISTRATION NO.: 1071921101406

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ACKNOWLEDGEMENT

I take this opportunity to thank the BHAIRAB GANGULY COLLEGE for the 2 amazing years of my college life and Being in the institution for pursuing the degree of M.com.

Special thanks to my supervisor **Dr. Sanjit Kumar**

Das for his assistance and support without whom I will not be able to complete the project in a wonderful way and also I got to know many things from my Supervisor.

THANK YOU SO MUCH SIR FOR YOUR GUIDANCE

ANNEXURE- 1

SUPERVISOR'S CERTIFICATE

This is to certify that Miss SOMALI MONDAL

Student of **M.COM**

Bhairab Ganguly College under the (West Bengal State University) has worked under my supervision and guidance for her Project Work and prepared a Project Report with the title –**IMPACT OF COVID-19 ON HAND SANITIZER**

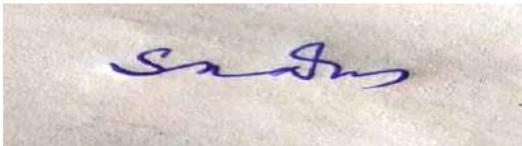
The Indian Scenario which she is submitting, is here genuine and original work to the best of my knowledge.

Name: Dr. Sanjit Kumar Das.

Name of the College: BHAIRAB GANGULY COLLEGE.

Designation: Associate Professor

Signature:

A photograph of a handwritten signature in blue ink on a light-colored surface. The signature is cursive and appears to read 'Sanjit Kumar Das'.

Place: Belgharia

Date:

ANNEXURE-2:

Student's Declaration

I hereby declare that the Project Work with the title -
IMPACT OF COVID-19 ON HAND SANITIZER submitted
by me for the partial fulfillment of the degree of M.Com
under the (West Bengal State University) is my original
work and has not been

submitted earlier to any other University for the
fulfillment of the requirement of any course of study.

I also declare that no chapter of this manuscript in
whole or in part has been incorporated in this report from
any earlier work done by others or by me. However,
extracts of any literature which has been used for this
report has been duly acknowledged providing detailed of
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CHAPTER 1: INTRODUCTION

INTRODUCTION

Hand sanitizers, otherwise known as hand antiseptics is an alternative to hand washing with soap and water. It can be made in different form such as gel, foam and liquid solution (sprays). The base of all hand sanitizers is alcohol. The alcohol used may be isopropyl alcohol (Isopropanol), ethanol- propanol or povidone-iodine. Alcohol based hand sanitizer are more effective in killing microorganisms. An alcohol is any organic compound in which the hydroxyl functional group (OH) is bound to a saturated carbon atom. The primary alcohol usually forms the base of hand sanitizer which is about 60%. Hand sanitizers effectiveness starts with its formula. The base of all hands sanitizers is alcohol, added to vitamin E, aloe vera and glycerine. The essential, and germ killing ingredient in hand sanitizers is the alcohol, and the minimum amount one needs for a sanitizer is 60%. The process of germ killing starts by removing the oil on the skin, the bacteria present in the body from coming to the surface. Then the alcohol kills the bacterial once rubbed over the hands. Hand sanitizers is clearly effective against gastrointestinal and, to a lesser extent, respiratory infections .Alcohol rubs also helps, to kill many different kinds of bacteria and TB bacteria. Medicinal plants are plants used in the management of many ailments and as such there applications are numerous. Examples include turmeric which contains a main bioactive compound curcumin; it has power anti-inflammatory effects and is a very strong anti-oxidant. The aim of this study is to produce hand sanitizers from locally grown medicinal plants. CDC recommends washing hands with soap and water whenever possible because hand washing reduces the amounts of all types of germs and chemicals on hands. But if soap and water are not available, using a hand sanitizer with at least 60% alcohol can help to avoid getting sick and spreading germs to others. The guidance for effective hand washing and use of hand sanitizer in community settings was developed based on data from a number of studies. Alcohol-based hand sanitizers can quickly reduce the number of microbes on hands in some situations, but sanitizers do not eliminate all types of germs.

BACKGROUND OF THE **STUDY**

The hand sanitizer market was valued at USD 2078.80 million in 2020, and it is expected to register a CAGR of 4.20% during the forecast period, 2021-2026. The hit of COVID-19 has tremendously affected the operations of several key players. Due to the sudden spike in COVID-19 cases, the World Health Organization (WHO) has recommended self prevention using hand sanitizers and regular practice of hand washing. Therefore, these efforts have increased the demand for hand sanitizers due to their convenience and growing awareness regarding sanitization. Moreover, due to the sudden increase in demand for hand sanitizers from April to July (2020), most retailers and pharmacies/drug stores ran out of stock. To counter such situations, government bodies of various countries and companies have struggled hard to meet consumer demand.

For instance, in India, more than 45 distilleries and 564 other manufacturers have been granted permission by the Indian government to produce hand sanitizers. Additionally, more than 55 distilleries are likely to be permitted in one or two days, and many more are being motivated to manufacture sanitizers in this scenario.

Rising awareness among consumers regarding the importance and significance of hand hygiene to prevent transmissible diseases is expected to boost the market growth. The portability and convenience served by hand sanitizers over hand washes are drawing a substantial consumer base, majorly augmenting the sales of gel-type sanitizers. The major companies operating in the market are adopting various strategies, such as promotional campaigns and media coverage, to increase their market shares.

By distribution channel, hypermarkets/supermarkets and pharmaceutical stores lead the industry, owing to consumers' attitude toward the conventional way of shopping and the channels' ability to attract maximum consumers seeking expediency and a wider variety of product ranges to choose from.

LITERATURE REVIEW

There are a number of literatures available in the websites regarding the above mentioned issues. However, few of them have been discussed here.

Simran R Kalyani (2021) focused on the impact of Covid-19 on the use of personal products in India with special reference to hygiene and sanitization products and argued that the use of sanitization products has been increased by leaps and bounds during this pandemic period.

Dr.V V Devi Prasad Kotni (2020) highlighted the consumer decision making process on the use of sanitizer during the pandemic period and mentioned that they always preferred for herbal products.

Dr.R.C.Sharma (2019) explores the factors that influence the buyers at the time of purchase of hand sanitizers. He also vividly discussed the social norms that create impact on the consumers at the time of purchasing the products. He opined that consumers are very much watchful about the incidents happening in the society.

Anute Nilesh (2018) opined that there is a high correlation between consumers' income and purchasing pattern of hygiene products of the consumers. He argued that the expenditure of the consumers for purchasing sanitizer have increased a lot during the pandemic period.

Ezlika Ghazali (2017) mainly focused on the use of organic sanitization products among the consumers elsewhere and mentioned that most of the consumers are well concerned about the hygiene issues.

OBJECTIVE OF THE STUDY

The basic objectives of the study has been narrated below

- To identify the most preferred type of sanitizer brand in India.
- To know the percentage change of consumer buying behavior of hand sanitizer.
- To destroy potentially harmful micro-organisms.
- To prevent the hands in becoming a vector cross infection.
- Render the hands socially clean in order to delivery of health care.

RESEARCH METHODOLOGY

Research based on hand sanitizer is present in medical fields so, I have tried my best to gather information from different sites of internet as due to this pandemic situation. However, I have tried to collect primary data from the respondents in the neighborhood through structured questionnaire. I have used this to gain an understanding of underlying reasons, opinions, and motivation. It also provides insights into the problems or helps to develop hypothesis for potential quantitative type descriptive research. Once I understood the things very well after conducting pilot surveys, going through literature, WHO reports continuously. I assumed certain things that will describe the buying behavior pattern of Hand Sanitizers in the future. Due to the pandemic situation I have taken a small survey of 50 respondents near my house who are easily available like family, neighbors, friends, students, job aspirants etc.

CHAPTER 2:

AN ANALYSIS OF INDIAN HAND

SANITIZER MARKET

MARKET DYNAMICS

The hand sanitizer market in India is being driven by the growing demand for cleanliness and hygiene. Due to the COVID-19 outbreak, the market for hand sanitizer is exponentially growing. It is expected to have a healthy growth over the forecast period of 2021-2026. The market is further growing due to the emergence of innovative formats of hand sanitizer to meet the urgent demand of the consumers. Several brands are designing hand sanitizers to provide effective preventive hygiene across the nation.

Hand sanitizer or hand anti-septic is a sanitizing agent, which comes in varied forms to be applied on hands in order to remove different disease-causing pathogens. It is used to inhibit the spread of disease by the transmission of germs and infections via hands. Ethyl alcohol, isopropyl alcohol, or a combination of both is used as active ingredients in hand sanitizer.

IMPACT OF COVID-19

With the sudden outbreak of the COVID-19 pandemic, the World Health Organization (WHO) has recommended the use of hand sanitizers for self-preservation and minimizing the spread of the Corona virus. The increasing number of deaths caused by the virus has further triggered an alarming response from consumers, thereby increasing the emphasis on hand hygiene as a preventive measure from contracting the infection. Moreover, the implementation of the Swachh Bharat Mission by the Government of India and various other campaigns by the private organizations that involve providing

hand sanitizers at railway stations, hospitals, shopping malls and educational institutes has also created a positive impact on the product demand.

The market is also driven by the launch of perfumed hand sanitizers infused with floral and fruit fragrances, such as rose, green apple, peach, orange and sandal. Product manufacturers are developing easy-to-use and portable foam and gel-based sanitizers in sachets and mini-plastic bottles. Manufacturers are also producing novel hands-free, battery- and foot-operated dispensers, which aid in minimizing the contact and the risks of cross-contamination. The dispensers are equipped with automatic infrared sensors that detect the heat emitted from the hand and trigger the pump to dispense the sanitizer.

RISING HEALTH CONCIIOUSNESS AMONG MASSES

The increasing demand for hand sanitizers is further supported by the rising prevalence of various gastrointestinal, respiratory and skin infections among the masses. Alcohol-based hand sanitizers can minimize the transmission of harmful bacteria and viruses present on the skin or palm of the hands, thereby reducing the instances of stomach infections, diarrhea, and nausea and vomiting. Hospitals and healthcare centers are also widely using hand sanitizers to prevent the transmission of hospital-acquired infections (HAIs). In comparison to the traditionally used hand washes and soaps, hand sanitizers are more effective in disinfecting and minimizing dryness and irritation on the skin. Product manufacturers are developing sanitizers with natural and organic ingredients that do not cause allergies and are non-toxic in nature.

ONLINE PRODUCT AVAILABILITY

The market is also driven by the proliferation of online retail channels and social media platforms. Consumers are increasingly becoming aware of the availability of premium personal care and hygiene products and are widely adopting healthy lifestyles. Product vendors are using innovative marketing strategies to promote sanitation products through influential celebrities and sports personalities to reach and attract a broader consumer base. They are also developing attractive packaging to grab the consumer's attention and provide them with an authentic and luxurious experience through their high-quality products. Through online retail platforms, consumers are now able to place orders from the convenience of their homes and the product manufacturers and vendors are able to reach the audiences present in remote locations.

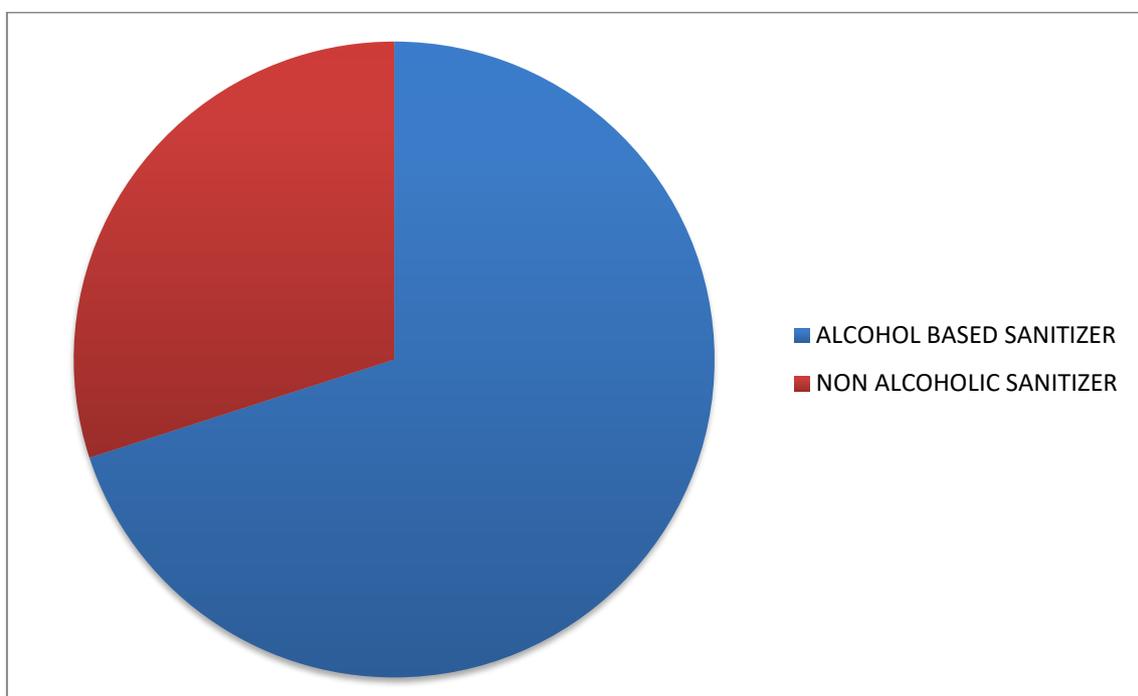
MARKET SEGMENTATION

IMARC Group provides an analysis of the key trends in each sub-segment of the India hand sanitizer market report, along with forecasts for growth at the region level from 2021-2026. Our report has categorized the market based on type, ingredient, product form, pack size, end-use, and distribution channel.

Breakup by Type:

- Alcohol- Based
- Non-Alcoholic

India Hand Sanitizer Market Share, By Type (in US\$ Million)

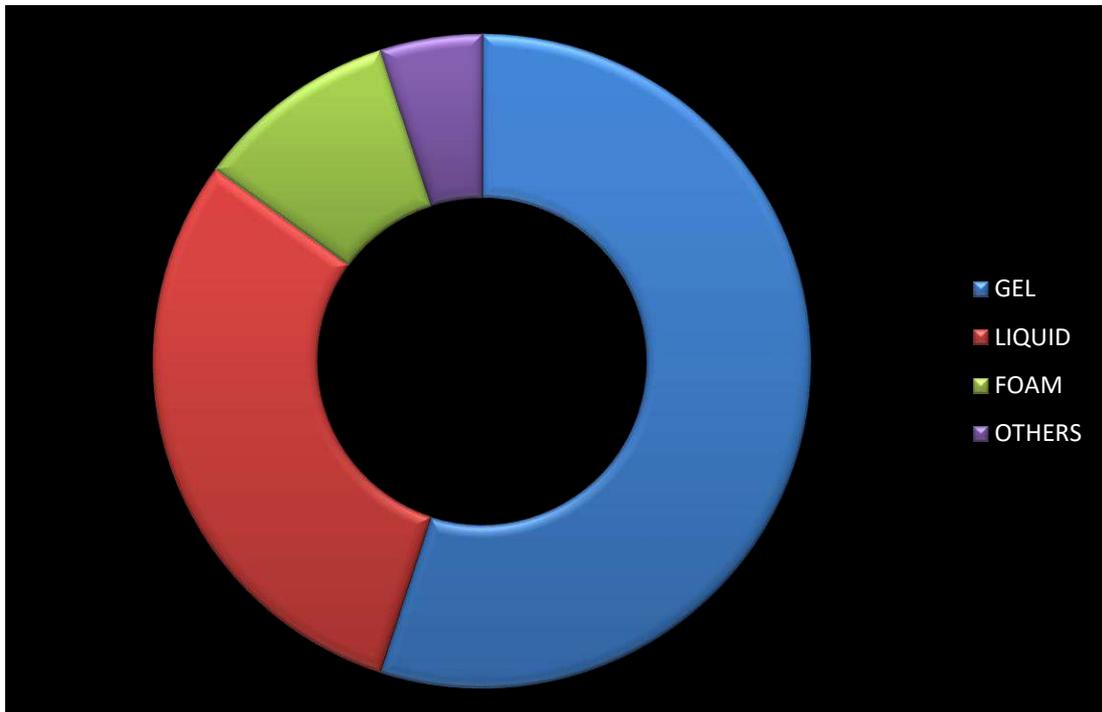


Breakup by Ingredient:

- Natural
- Organic
- Synthetic

Breakup by Product Form:

- Gel
- Liquid
- Foam
- Others

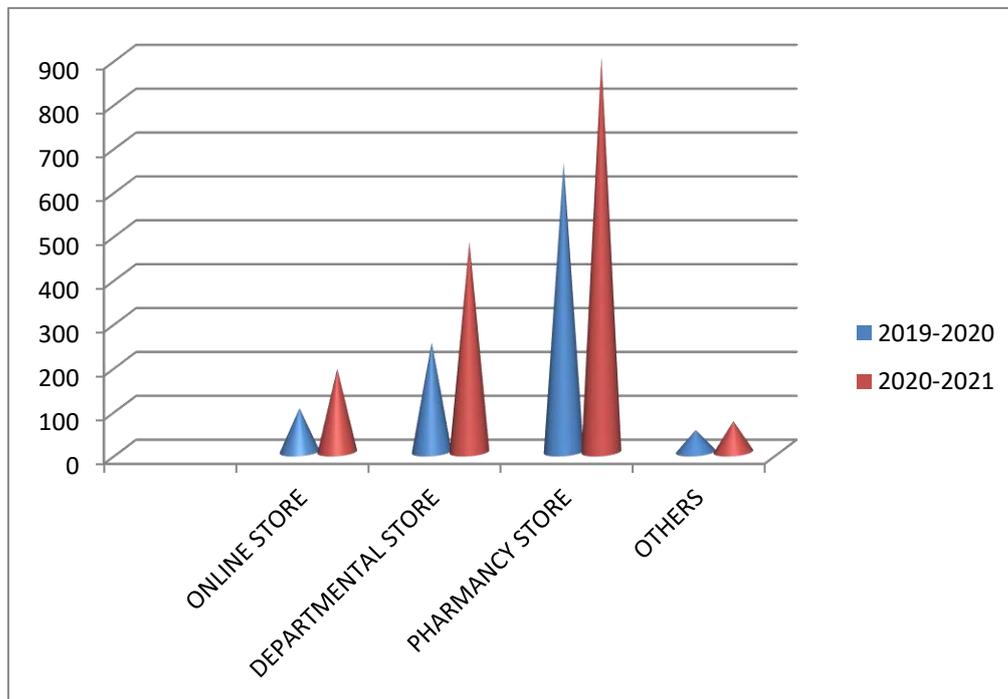


Breakup by Pack Size:

- Small
- Medium
- Large

Breakup by Distribution Channel:

- Pharmacies
- Supermarkets and Hypermarkets
- Departmental Stores
- Online
- Others



Breakup by End-Use:

- Hospitals
- Households
- Restaurants and Hotels
- Others

Breakup by Region:

- West India
- South India
- North India
- East India

COMPETITIVE LANDSCAPE

The competitive landscape of the industry has also been examined with some of the key players being ITC Limited, Dabur India Limited, Hindustan Unilever Limited, The Himalaya Drug Company, Reckitt Benckiser (India) Ltd, Godrej Consumer Products Ltd., Cossmic India Pvt. Ltd., Cipla, Piramal Enterprise, Marico ltd, Sachdeva Enterprise etc.

DETTOL DISINFECTANT SANITIZER SPRAY



Dettol, the most popular brands in India also offers a disinfectant spray. It offers protection from a hundred illness-causing germs and can be used on both hard and soft surfaces. The disinfectant spray leaves behind original pine fragrance, allowing you to use without worrying about any bad smells. It evaporated within ten seconds of being sprayed.

SAVLON SURFACE DISINFECTANT SPRAY



The Savlon Surface Disinfectant spray can be used on both hard and soft surfaces at home. It eliminates 99.99% of germs, including antibiotic resistant germs, offering good protection for your family. It can be used to eliminate viruses, bacteria, mold and fungi. As per the company, it can eliminate H1N1 virus, Rotavirus and Corona virus.

TRI-ACTIV DISINFECTANT SPRAY



The Tri-Active disinfectant spray offers protection from virus, bacteria and germs. It eliminates 99.99% of illness causing germs, offering complete protection for your family. It is also effective against mold and fungi and leaves behind a pleasant fragrance. The spray comes in a pack of two cans of 230 ml each.

MARICO'S TRAVEL PROTECT SURFACE DISINFECTANT **SPRAY**



The Marico Travel Protect surface disinfectant spray is effective against viruses, fungi and bacteria. It eliminates over 99.99% of germs, offering protection for your family. It is suitable for both hard and soft surfaces and can also be used on your smart phone. It can also be used on skin, allowing you to disinfect yourself.

CIPLA CIPHANDS DAILY DISINFECTANT SPRAY



The Cipla Ciphands disinfectant spray is suitable for all surfaces and no wiping is required after spraying it. It comes with an instant action formula that works on both hard and soft surfaces. It eliminates 99.99% of germs and is effective against bacteria, fungi and viruses. It offers quick action within thirty seconds of spraying it.

LIFEBUOY ANTIBACTERIAL GERM KILL SPRAY



The Lifebuoy antibacterial germ kill spray is effective against illness causing bacteria and viruses. It eliminates 99.99% of bacteria and viruses, making it a good option for your family. It can be used on surfaces as well as your skin. It has a no gas formula and guarantees 1100 sprays per bottle.

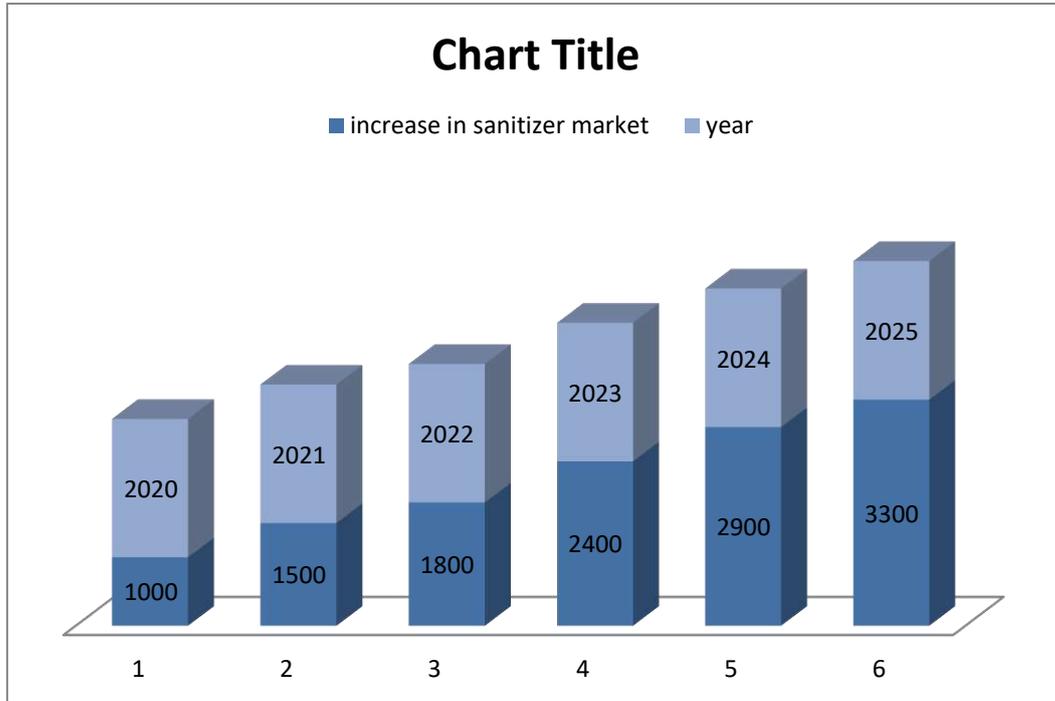
CHAPTER:3 FUTURE TRENDS

MARKET FORECAST

The India hand sanitizer market reached a value of US\$ 123.5 Million in 2020. Looking forward, the market is expected to grow at a CAGR of around 13% during 2021-2026. Keeping in mind the uncertainties of COVID-19, we are continuously tracking and evaluating the direct as well as the indirect influence of the pandemic. These insights are included in the report market contributor.

A hand sanitizer, or a hand rub, is an antiseptic solution applied on the hands to remove disease-causing pathogens from the skin. It is commonly available in foam, gel and liquid-based variants and consists of alcohol, water, emollients, polyacrylates, artificial and natural colors and fragrances. The alcohol used in hand sanitizers includes isopropanol and ethanol, which instantly denatures the proteins and destroys lipid-based coatings of certain viruses and bacteria. Emollients and other ingredients are added in small quantities to protect the skin from dryness caused by the alcohol, neutralize the acidic effects of polyacrylate and enhance the smell and appearance of the product. The water acts as a carrier for the ingredients and bonds well with the hydro gel. Currently, alcohol-free variants are also available, which are manufactured using glycerin, thickening agents and disinfectants, such as benzalkonium chloride (BAC) and other antimicrobial agents. These hand sanitizers also contain humectants that attract and lock moisture in the hands and do not remove natural oils from the skin despite repetitive use.

MARKET, 2020-2025 (IN US\$ MILLION)



MARKET CHALLENGE

Risks in competitions with global player .This research study examines the current market trends related to the demand, supply, and sales, in addition to the recent developments. Major drivers, restraints, and opportunities have been covered to provide an exhaustive picture of the market. The analysis presents in-depth information regarding the development, trends, and industry policies and regulations implemented in each of the geographical region. Further, the overall regulatory framework of the market has been exhaustively covered to offer stakeholders a better understanding of the key factors affecting the overall market environment.

KEY INCLUSIONS: MARKET REPORT

- COVID-19 effects on Hand Sanitizer Market in India Market growth factors.
- Statistical analysis pertaining to Hand Sanitizer Market in India market size, sales volume, and overall industry revenue.
- Organized mentions of major Hand Sanitizer Market in India market trends.
- Growth opportunities related to top key players
- Figures showcasing market growth rate over the forecast period.
- Advantages and disadvantages of direct and indirect sales channels.
- Insights regarding traders, distributors, and dealers present in the industry.

INDIAN HAND SANITIZER MARKET

OUTLOOK

The rising awareness among consumers about the personal hygiene owing to rising infectious diseases is a major factor that is increasing the growth of this market. Moreover, World Health Organization also recommended to use hand sanitizer for self-prevention that increases the need of sanitizer which is a kind of disinfectant which in turn rising the growth of the Hand Sanitizers Market over 2020-2025.

Rising government initiatives for the adoption of hand sanitizers in order to minimize the spread of transmissible diseases are increasing the growth of this Market.

Moreover, various regulatory agencies are working together in order to improve the lives of people during pandemic also driving the growth of Hand Sanitizers Market over 2020-2025.

COVID-19 pandemic had greatly affected the growth of hand sanitizer market analysis. Owing to increasing COVID-19 cases, the demand of hand sanitizers increases in order to get protection from virus that increases the production and sales of hand sanitizers and are positively impacted the growth of this.

CHAPTER:4 ANALYSIS OF RESEARCH

RESULTS

Q1) WHAT TYPE OF HAND SANITIZER IS BEING PREFERRED?

I did a survey of 50 people near my location to know exactly what is the preferred type of sanitizer is liked by them -like how many of them use Gel type, Foam type, Liquid type, none.

Here are my analysis –

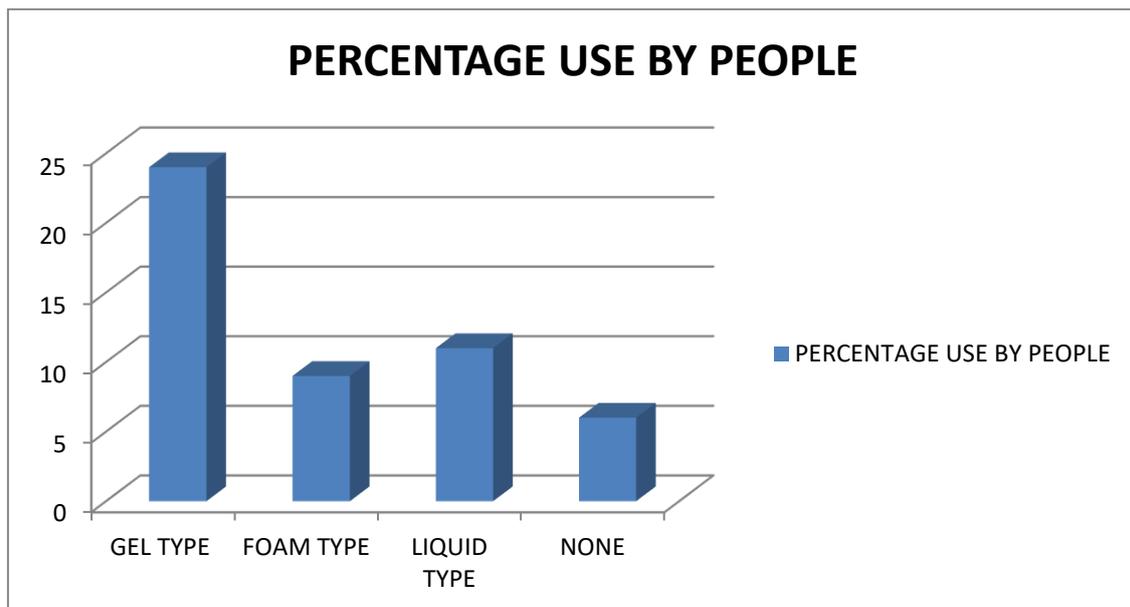
Table showing preferred type of hand sanitizer of the respondents

Table - 1

Preferred type of sanitizer	Percentage use by people
Gel Type	24
Foam Type	9
Liquid Type	11
None	6

Diagram showing preferred type of sanitizer of respondents

Figure 1



**Q2) THE SECOND QUESTION I HAVE ASKED TO THE RESPONDENTS WAS –
“THE TYPE OF PREVENTIVE MEASURES THEY PREFER – LIKE HAND
SANITIZER OR SOAP OR HANDWASH”**

DIFFERENT PEOPLE HAVE DIFFERENT PREFERENCE WHICH I HAVE TRIED TO UNDERSTAND
AND CONCLUDED THE FOLLOWING RESULTS IN TABLE.

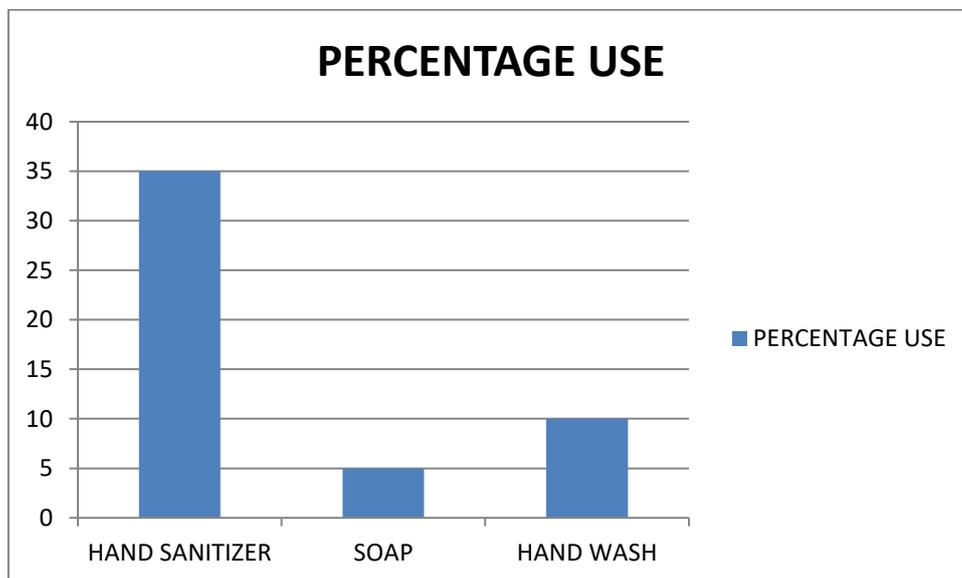
Table showing preventive measures

TABLE 2

<u>MOST PREFERRED PREVENTIVE MEASURES</u>	<u>PERCENTAGE USE</u>
HAND SANITIZER	35
SOAP	5
HAND WASH	10

Diagram showing preventive measures

Figure 2



Q3) MY THIRD INTERROGATION TO THEM WAS ABOUT THEIR EDUCATION QUALIFICATION

I WANT TO KNOW THAT WEATHER USE OF SANITIZER DEPENDS ON EDUCATION QUALIFICATION OR NOT . FROM SURVEY OF THE RESPONDENDS I HAVE FOUND THAT AMONG THEM SOME ARE SCHOOL STUDENDS AND PERSUING 10TH OR 12TH SANDARD, SOME ARE DIPLOMA AND GRADUATE STUDENTS AND I HAVE FOUND THAT AMONG ALL OF THEM THE GRADUATE RESPONDENTS USE MAXIMUM PERCENTAGE OF HAND SANITIZER.

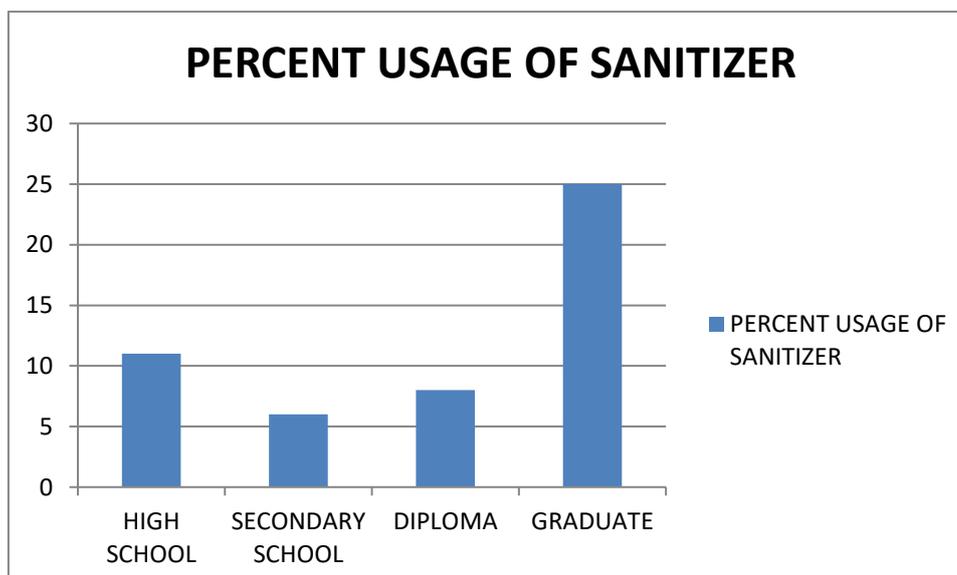
Table showing the education qualification of the respondents

TABLE-3

<u>EDUCATION QUALIFICATION OF THE RESPONDENTS</u>	<u>PERCENTAGE USAGE OF SANITIZER</u>
HIGH SCHOOL	11
SECONDARY SCHOOL	6
DIPLOMA	8
GRADUATE	25

Diagram showing the education qualification of the respondents

Figure 3



Q4) PERCENTAGE USE OF HAND SANITIZER BY MALE AND FEMALE

HERE I HAVE GOT SOME STRANGE ANSWERS FROM MY MALE RESPONDENTS ACCORDING TO THEM SOME SAYS THEY DON'T REMEMBER TO USE WHEN THEY REUNITE IN TEA STALL OR WHEN THEY ARE IN MARKET AND SOME SAYS USE SANITIZER MORE THAN 1-2TIMES DAMAGES THEIR SKIN AND THERE ARE SOME PEOPLE WHO SAID SOME VALID THINGS THAT WHILE DOING OFFICIAL WORK IT IS NOT POSSIBLE TO USE EVERYTIME BT THEY USE WHENEVER THEY NEEDED

ON THE OTHER HAND FEMALE RESPONDANT ARE MORE AWARE AS THEY HAVE ELDERS AND CHILDERN WHOM THE FEMALS HAVE TO TAKE CARE .

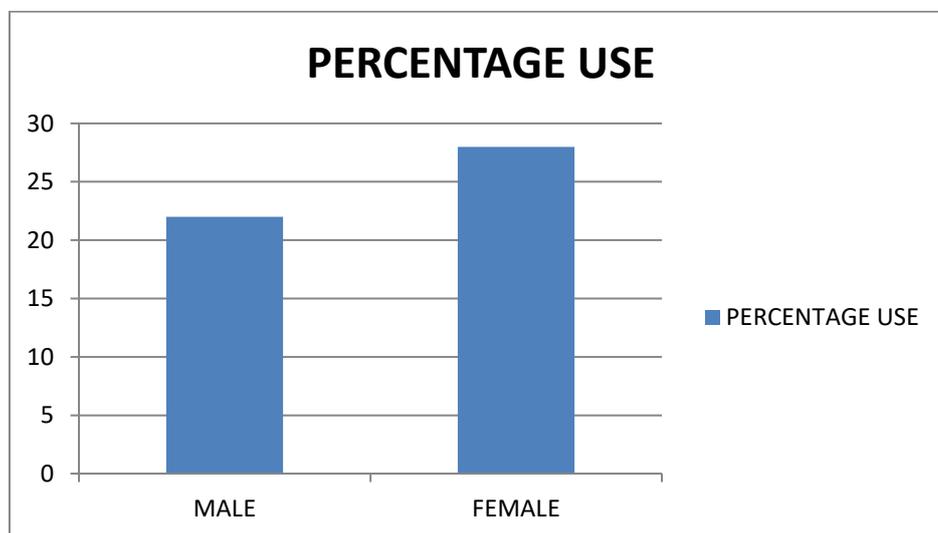
Table showing preference of sanitizer as per gender

TABLE 4

<u>PREFERENCE OF SANITIZER AS PER GENDER</u>	<u>PERCENTAGE USE</u>
MALE	22
FEMALE	28

Diagram Table showing preference of sanitizer as per gender

Figure 4



Q5) PREFERENCE IN BUYING OF SANITIZER BASED ON ALCOHOL AND NON ALCOHOL

From the above survey I had observed that the people who are aware of the virus and are educated they generally prefer sanitizer which have more percentage of alcohol.

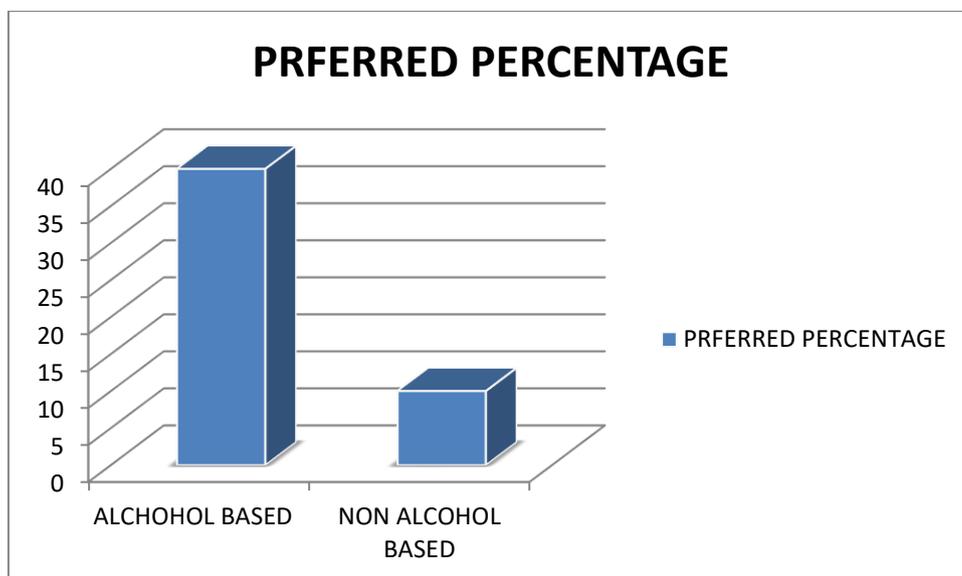
Table showing buying behavior of sanitizer based on alcoholic and non alcoholic

TABLE- 5

<u>ALCOHOL BASED AND NON ALCOHOL BASED</u>	<u>PREFERRED PERCENTAGE</u>
ALCOHOL BASED	40
NON ALCOHOL BASED	10

Diagram showing buying behavior of sanitizer based on alcoholic and non alcoholic

Figure-5



Q6) MY SIXTH QUESTION TO THE RESPONDENTS WAS THE PERCENTAGE USE OF HAND SANITIZER WHEN THEY GO OUT OF THEIR HOUSE.

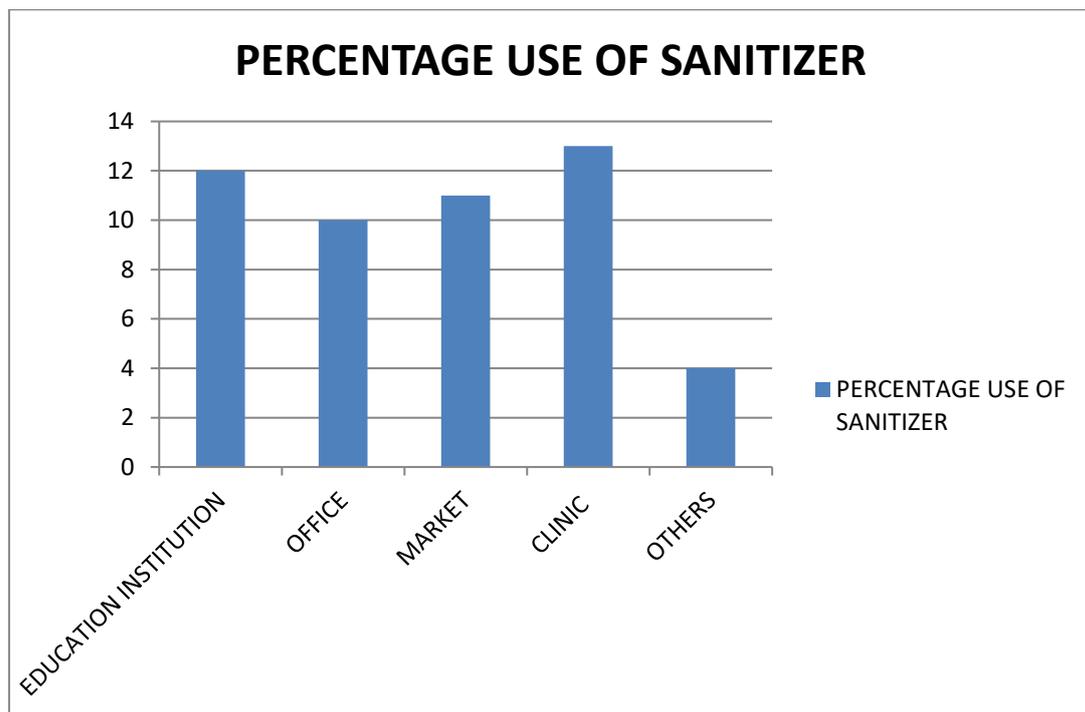
Table showing the no. of person use sanitizer when they go outside the house

TABLE-6

<u>USE OF SANITIZER WHEN THEY GO OUT</u>	<u>PERCENTAGE USE OF SANITIZER</u>
EDUCATION INSTITUTE	12
OFFICE	10
MARKET	11
CLINIC	13
OTHERS	4

Diagram showing the no. of person use sanitizer when they go outside the house

Figure-6



Q7) USE OF HAND SANITIZER BY DIFFERENT INSTITUTIONS

According to my respondents they said that use of sanitizer depends differently on the public places like hospitals, medical stores, hotels, restaurants and others.

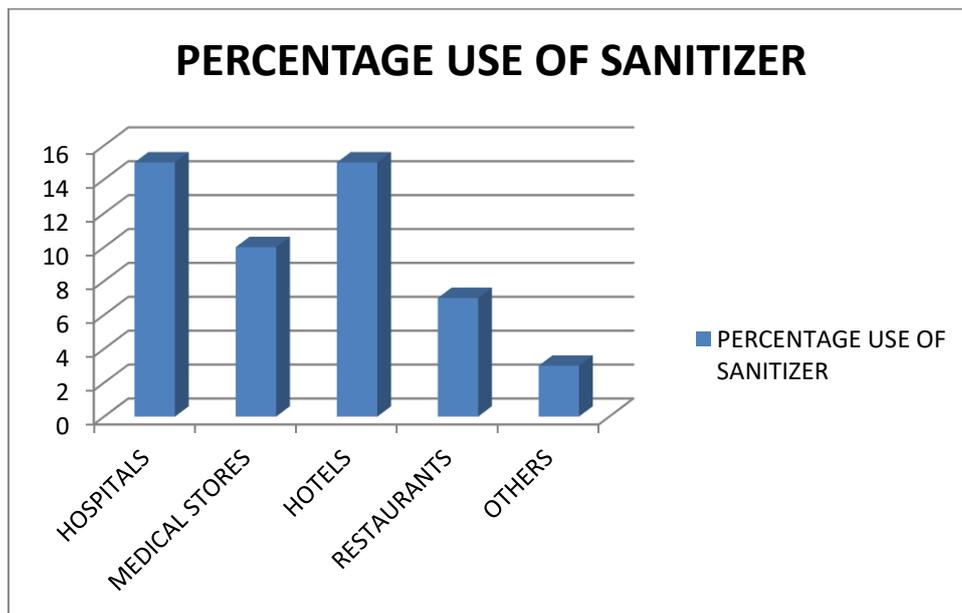
Table showing the use of sanitizer by different institutions

TABLE-7

<u>SANITIZER USED BY INSTITUTIONS</u>	<u>PERCENTAGE USE OF SANITIZER</u>
HOSPITALS	15
MEDICAL STORES	10
HOTELS	15
RESTAURANTS	7
OTHERS	3

Diagram showing the use of sanitizer by different institutions

Figure-7



Q8) MY EIGHTH QUESTION IS ABOUT WHAT IS THE PRFERRED BANDS OF SANITIZER THEY LIKE TO USE THE MOST

Every single person have different taste, different preference and brand satisfaction and among that I found that Dettol is the most preferred brand.

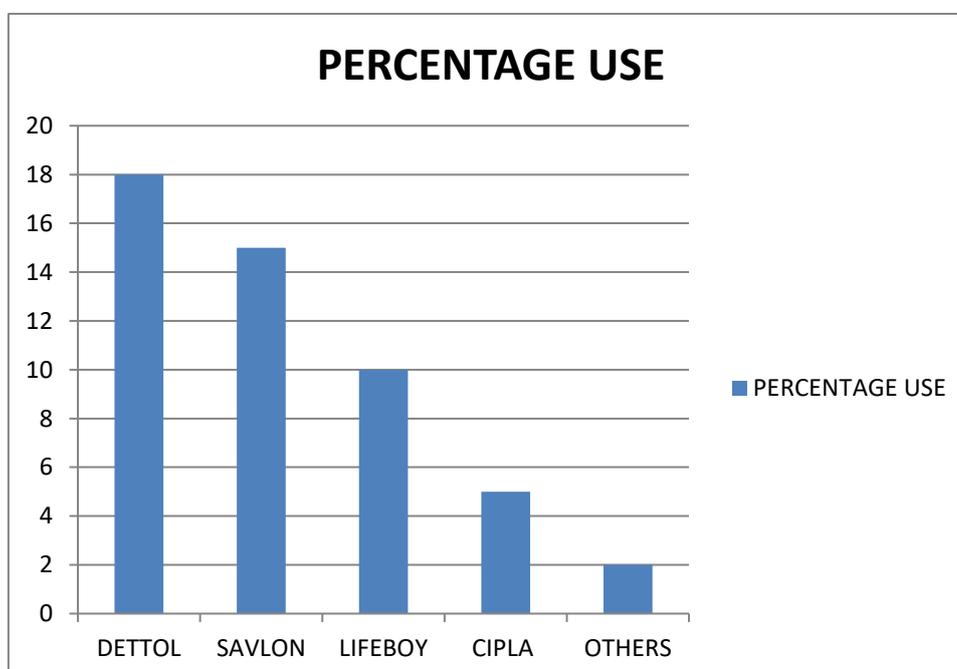
Table showing the most preferable brand demand of sanitizer

TABLE-8

<u>PREFERRED BRAND</u>	<u>PERCENTAGE USE OF SANITIZER</u>
DETTOL	18
SAVLON	15
LIFEBOY	10
CIPLA	5
OTHERS	2

Diagram showing the most preferable brand demand of sanitizer

Figure-8



Q9) PREFERRED ATTRIBUTE OF BUYING HAND SANITIZER

From my survey I have understand that using of sanitizer also depends on many factors like on income and some like with a good fragrance and some people by checking the germ killing capacity.

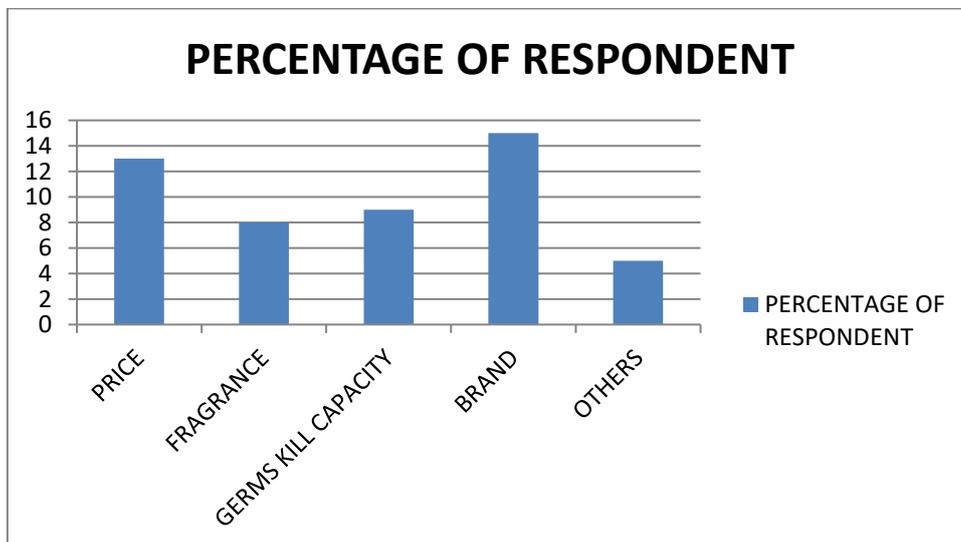
Table showing the preferred attribute of buying sanitizer

TABLE-9

<u>MOST PREFERRED ATTRIBUTE</u>	<u>PERCENTAGE OF RESPONDENTS</u>
PRICE	13
FRAGRANCE	8
GERMS KILL CAPACITY	9
BRAND	15
OTHERS	5

Diagram showing the preferred attribute of buying sanitizer

Figure-9



Q10) WHAT IS THE PERCENTAGE USE OF SANITIZER AS PER THE PROFFESION

Using of sanitizer also depends on the professions, more is used where the public dealings are more and less where the public dealings are less.

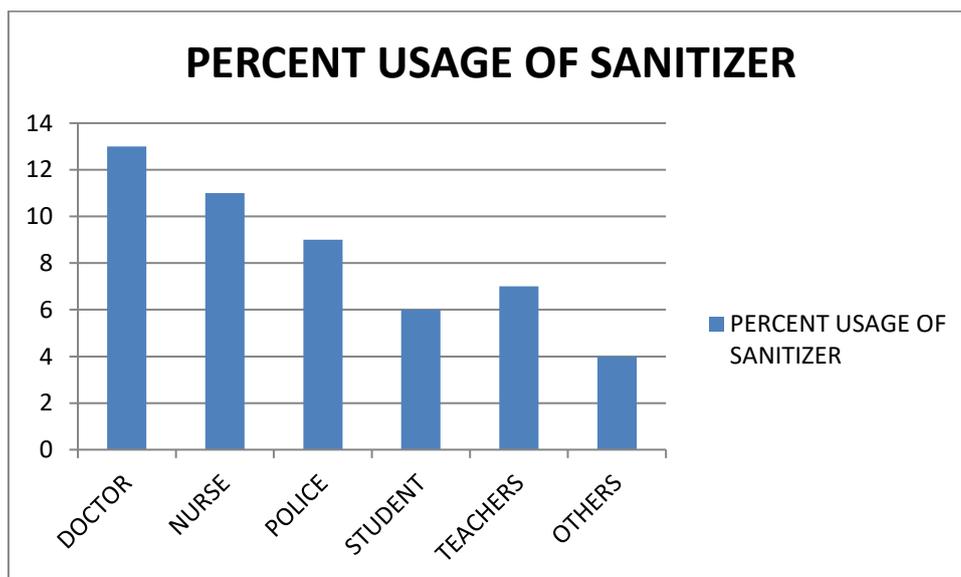
Table showing the percentage use of sanitizer in professional place

TABLE-10

<u>USE OF SANITIZER ACCORDIND TO PROFFESION</u>	<u>PERCENTAGE USAGE OF SANITIZER</u>
DOCTOR	13
NURSE	11
POLICE	9
STUDENT	6
TEACHERS	7
OTHERS	4

Diagram showing the percentage use of sanitizer in professional place

Figure-10



CHAPTER:5 CONCLUSION

Consumers prefer hand sanitizers as they are more convenient and handier to use when compared to soap and hand wash. The market landscape of hand hygiene products has drastically changed since the outbreak of COVID-19 as use of sanitizers is now being treated as a major preventive measure. Growing consumer inclination towards health and wellness, rising awareness about health and hygiene, improvement in standard of living and rise in health expenditure are few of the major factors leading to increasing inclination towards hand sanitization. The average market demand across the globe is likely to witness a phenomenal rise of over 600% during 2020. The increasing demand of sanitizing solutions and preventive measures as recommendation by WHO are expected to fuel the market growth. So, the study is conducted to find out the impact of COVID-19 on Hand Sanitizer market in India. On the basis of a primary survey among the respondents in nearby locality this study argues that the importance of hand sanitizers is of paramount importance in the context of the present pandemic period.

CHAPTER:6 ANNEXURES

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QUESTIONNAIRE

Q1)What is the preferred type of hand sanitizer of the respondents

- (A)Gel type
- (B) Liquid type
- (C) Foam type
- (D) None

Q2) What are the types of preventive measure they would like to prefer

- (A)Hand sanitizer
- (B) Soap
- (C) Hand wash

Q3)Education qualification of the respondents

- (A)High school
- (B)secondary school
- (C) Diploma
- (D)Graduate

Q4)Percentage use of sanitizer according to gender

- (A)male
- (B)Female

Q5) Preference in buying of sanitizer based on alcohol and non alcohol

(A)Alcohol based

(B)Non alcohol based

Q6) Percentage use of hand sanitizer when they go out of their house.

(A)Education institute

(B)Office

(C)Market

(D)Clinic

(E)Others

Q7) Use of sanitizer by different institutions

(A)Hospitals

(B)Medical stores

(C)Hotels

(D)Restaurants

(E)Others

Q8) What is the preferred brands of sanitizer they like to use the most?

- (A) Dettol
- (B) Savlon
- (c) Lifebuoy
- (D) Cipla

Q9) What is the most preferred attribute of buying hand sanitizer

- (A) Price
- (B) Fragrance
- (C) Germs kill capacity
- (D) Brands
- (E) Others

Q10) What is the percentage use of sanitizer as per profession

- (A) Doctor
- (B) Nurse
- (C) Police
- (D) Students
- (E) Teachers
- (F) Others

PROJECT REPORT

*(Submitted for the Degree of M.com in Accounting & Finance under the West
Bengal State University)*

A STUDY OF CORPORATE SOCIAL RESPONSIBILITY OF TATA COMPANIES

Submitted by

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This project has been done with the help of different journals, websites and magazines.

My supervisor Teacher **Prof.Amitava Saha** has also helped me a lot in pointing out my mistakes and channelized me in a proper way. He directed me about how to proceed with the data. I am highly obliged to him for his kind support and instructions.

I am also thankful to the companies whose secondary data has served my purpose. I hope my project will give an idea about **A STUDY OF CORPORAT SOCIAL RESPONSIBILITY OF TATA COMPANIES** and is followed along its importance.

I will always remember the making of this project work and the knowledge I gained while doing so.

Concluding this with a heartiest thanks to my college and its faculty members for always be.

Thank you.

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ANNEXURE – IA

SUPERVISOR’S CERTIFICATE

This is to certify that Mr. **SOURAV KUMAR PANDEY**, a student of **M.com in Accounting & Finance** in **BHAIRAB GANGULY COLLEGE** under the **WEST BENGAL STATE UNIVERSITY** has worked under my supervision and guidance for his Project Report with the title **A STUDY OF CORPORATE SOCIAL RESPONSIBILITY OF TATA COMPANIES** which he is submitting, is his genuine and original work to the best of my knowledge.

NAME : Prof.Amitava Saha

NAME OF THE COLLEGE : Bhairab Ganguly college

DESIGNATION : Assistant Professor.

SIGNATURE :

PLACE:

DATE:

ANNEXURE : IB

STUDENT'S DECLARATION

I hereby declare that the Project Work with the title A **STUDY OF CORPORATE SOCIAL RESPONSIBILTY OF TATA COMPANIES** submitted by me for the partial fulfillment of the degree of M.COM in Accounting & Finance in Business under the West Bengal State University is my original work and has not been submitted earlier to any other University / Institution for the fulfillment of the requirement for any course of study.

I also declare that no chapter of this manuscript in whole or in part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the references.

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Chapter no .1

1.1INTRODUCTION

Ranging from steel, automobiles and software to consumer goods and telecommunications the Tata Group operates more than 80 companies . It has around 200,000 employees across India and thus has the pride to be nation's largest private employer. Mr. Ratan N. Tata has led the eminent Tata Group successfully. He was trained as an architect at New York's Cornell University but he chose to enter the family business .He assumed the Chairmanship of the Group in 1991. Named Business Man of the Year for Asia by Forbes in 2004, Mr. Ratan Tata serves on the board of the Ford Foundation and the program board of the Bill & Melinda Gates Foundation's India AIDS initiative. Tata Group chairman Ratan Naval Tata has stepped down to pass on the entire responsibility to Cyrus Mistry . Under Tata, the group went through major organisational phases — rationalisation, globalisation, and now innovation, as it attempts to reach a reported \$500 billion in revenues by 2020-21, roughly the size of what Walmart is today. 13 Approximately two third of the equity of the parent firm, Tata Sons Ltd., is held by philanthropic trusts endowed by Sir Dorabji Tata and Sir Ratan Tata, sons of Jamsetji Tata, the founder of today's Tata empire in the 1860s. Through these trusts, Tata Sons Ltd. utilizes on average between 8 to 14 percent of its net profit every year for various social causes. Even when economic conditions were adverse, as in the late 1990s, the financial commitment of the group towards social activities kept on increasing, from Rs 670 million in 1997-98 to Rs 1.36 billion in 1999-2000. In the fiscal year 2004 Tata Steel alone spent Rs 45 crore on social services. . 14 Tata is accredited to initiate various labor welfare laws. For example- the establishment of Welfare Department was introduced in 1917 and enforced by law in 1948; Maternity Benefit was introduced in 1928 and enforced by law in 1946. A pioneer in several areas, the Tata group has got the credit of pioneering India's steel industry, civil aviation and starting the country's first power plant. It had the world's largest integrated tea operation. It is world's sixth largest manufacturer of watches (Titan)

1.2. Literature review

The concept of CSR originated in the 1950's in the USA but it became prevalent in early 1970s . At that time US had lots of social problems like poverty, unemployment and pollution. Consequently a huge fall in the prices of Dollar was witnessed. Corporate Social Responsibility became a matter of utmost importance for diverse groups demanding change in the business. During the 1980's to 2000, corporations recognized and started accepting a responsibility towards society. Corporate social responsibility (CSR) focuses on the wealth creation for the optimal benefit of all stakeholders – including shareholders, employees, customers, environment and society. The term stakeholder, means all those on whom an organization's performance and activities have some impact either directly or indirectly. This term was used to describe corporate owners beyond shareholders as a result of a book titled Strategic management: a stakeholder approach by R. Edward Freeman in the year 1984. 1 According to Bowen, —CSR refers to the obligations of businessmen to pursue those policies to make those decisions or to follow those lines of relations which are desirable in terms of the objectives and values of our society. — 2 Frederick (1960) stated ‘_Social responsibility means that businessmen should oversee the operation of an economic system that fulfills the expectations of the people.’ 3 Davis (1960) argued that social responsibility is a nebulous idea but should be seen in a managerial context. He asserted that some socially responsible business decisions can be justified by a long, complicated process of reasoning as having a good chance of bringing long-run economic gain to the firm, thus paying it back for its socially responsible outlook (p. 70). 4 An ideal CSR has both ethical and philosophical dimensions, particularly in India where there exists a wide gap between sections of people in terms of income and standards as well as socio-economic status (Bajpai, 2001)5 . Goyder(2003) argues: —Industry in the 20th century can no longer be regarded as a private arrangement for enriching shareholders. It has become a joint enterprise in which workers, management, consumers, the locality, govt. and trade union officials all play a part. If the system which we know by the name private enterprise is to continue, some way must be found to embrace many interests whom we go to make up industry in a common purpose.||). 6 CSR implies some sort of commitment, through corporate policies and action. This operational view of CSR is reflected in a firm's social performance, which can be assessed by how a firm manages its societal relationships, its social impact and the outcomes of its CSR policies and actions (Wood, 1991). 7

1.3. OBJECTIVES OF THE STUDY

To understand the concept of CSR
find out the scope of CSR
know how the Tata group has fulfilled its responsibility towards all stakeholders; what specific activities, programs and strategies it has set, devised and implemented for the same.

1.4 METHODOLOGY

These project done adof[tong the secondary data which was collect from different journals ,books ,magazine and company web site

This project is done adopting the qualitative analysis method. It is based on secondary data as it is not possible to collect primary data within short period of time. I have accessed various websites, journals, books and magazines to collect different types of data. Secondary research (also known as desk research) involves the summary, collation and/or synthesis of existing research rather than primary research, in which data are collected from, for example, research subjects or experiments.

-

1.5 LIMITATIONS OF STUDY

The hindrances faced by me while doing the project-

- Due to shortage of time primary data could not be collected.
- Proper data regarding how much companies are polluting and as to what percentage of their profit they are spending for the society is not revealed.
- Business sometimes prevent the auditor of the company to detect a fraud which actually creates a bad image in the name of accountants.

Chapter no.2.

CONCEPTUAL FRAMEWORK : NATIONAL / INTERNATIONAL SCENARIO

CORPORATE SOCIAL RESPONSIBILTY IN INDIAN SCENARIO

2.1 EVOLUTION OF CSR IN INDIA:

The conditions for business operations in India vary for different areas, and consequently, so will the way CSR is perceived and implemented. . In the pre-industrialized period philanthropy, religion and charity were the key drivers of CSR. The industrial families of the 19th century had a strong inclination toward charity and other social considerations. The term CSR itself came into common use in the early 1970s. The last decade of the twentieth century witnessed a shift in focus from charity and traditional philanthropy toward more direct engagement of business in mainstream development and concern for disadvantaged groups in the society. In India, there is a growing realization that business cannot succeed in isolation and social progress is necessary for sustainable growth. An ideal CSR practice has both ethical and philosophical dimensions, particularly in India where there exists a wide gap between sections of people in terms of income and standards as well socio-economic status.

In India, the evolution of CSR refers to changes over time in cultural norms of corporations' engagement and the way businesses managed to develop positive impacts on communities, cultures, societies, and environment in which those corporations operated. CSR motives changed during the independence movement in India toward social reforms to encourage empowerment of women and rural development. In the last decade, CSR has rapidly evolved in India with some companies focusing on strategic CSR initiatives to contribute toward nation building. Gradually, the companies in India

To exhaustively study the contributions made

2.2 .SCOPE OF CSR

“The World Business Council for Sustainable Development” has described CSR as the business contribution to sustainable economic development. Building on a base of compliance with legislation and regulations.

CSR typically includes “beyond law” commitments and activities pertaining to:

- corporate governance and ethics;
- health and safety;
- environmental stewardship;
- human rights (including core labour rights);
- sustainable development;
- conditions of work (including safety and health, hours of work, wages);
- industrial relations;
- community involvement, development and investment;
- involvement of and respect for diverse cultures and disadvantaged peoples;
- corporate philanthropy and employee volunteering;
- customer satisfaction and adherence to principles of fair competition;
- anti-bribery and anti-corruption measures;
- accountability, transparency and performance reporting; and
- supplier relations, for both domestic and international supply chains.

2.3. NEED OF CSR

Many factors and influences have led to increasing attention being devoted to the role of companies and CSR. These include:

- **Sustainable development**: United Nations’ (UN) studies and many others have underlined the fact that humankind is using natural resources at a faster rate than they are being replaced. If this continues, future generations will not have the resources they need for their development. In this sense, much of current development is unsustainable—it can’t be continued for both practical and moral reasons. Related issues include the need for greater attention to poverty

alleviation and respect for human rights. *CSR is an entry point for understanding sustainable development issues and responding to them in a firm's business strategy.*

- **Globalization**: With its attendant focus on cross-border trade, multinational enterprises and global supply chains—economic globalization is increasingly raising CSR concerns related to human resource management practices, environmental protection, and health and safety, among other things. *CSR can play a vital role in detecting how business impacts labour conditions, local communities and economies, and what steps can be taken to ensure business helps to maintain and build the public good. This can be especially important for export-oriented firms in emerging economies.*

- **Governance**: Governments and intergovernmental bodies, such as the UN, the Organisation for Economic Co-operation and Development (OECD) and the International Labour Organization (ILO) have developed various compacts, declarations, guidelines, principles and other instruments that outline norms for what they consider to be acceptable business conduct. *CSR instruments often reflect internationally-agreed goals and laws regarding human rights, the environment and anti-corruption.*

- **Corporate sector impact**: The sheer size and number of corporations, and their potential to impact political, social and environmental systems relative to governments and civil society, raise questions about influence and accountability. Even small and medium size enterprises (SMEs), which collectively represent the largest single employer, have a significant impact. *Companies are global ambassadors of change and values. How they behave is becoming a matter of increasing interest and importance.*

- **Communications**: Advances in communications technology, such as the Internet and mobile phones, are making it easier to track and discuss corporate activities. Internally, this can facilitate management, reporting and change. Externally, NGOs, the media and others can quickly assess and profile business practices they view as either problematic or exemplary. *In the CSR context, modern communications technology offers opportunities to improve dialogue and partnerships.*

- **Finance**: Consumers and investors are showing increasing interest in supporting responsible business practices and are demanding more information on how companies are addressing risks and opportunities related to social and environmental issues. *A sound CSR approach can help build share value, lower the cost of capital, and ensure better responsiveness to markets.*

- **Ethics:** A number of serious and high-profile breaches of corporate ethics resulting in damage to employees, shareholders, communities or the environment—as well as share price—have contributed to elevated public mistrust of corporations. *A CSR approach can help improve corporate governance, transparency, accountability and ethical standards.*
- **Consistency and Community:** Citizens in many countries are making it clear that corporations should meet the same high standards of social and environmental care, no matter where they operate. *In the CSR context, firms can help build a sense of community and shared approach to common problems.*
- **Leadership:** At the same time, there is increasing awareness of the limits of government legislative and regulatory initiatives to effectively capture all the issues that CSR address. *CSR can offer the flexibility and incentive for firms to act in advance of regulations, or in areas where regulations seem unlikely.*

2.4. The IMPORTANCE OF CSR IN BUSINESS

There is growing consensus about the connection between CSR and business success.

“**The World Business Council for Sustainable Development (WBCSD)**” has noted that a coherent CSR strategy based on integrity, sound values and a long-term approach offers clear business benefits to companies and contributes to the well-being of society.

Key potential benefits for firms implementing CSR include:

- **Better anticipation and management of an ever-expanding spectrum of Risk :** Effectively managing governance, legal, social, environmental, economic and other risks in an increasingly complex market environment, with greater oversight and stakeholder scrutiny of corporate activities, can improve the security of supply and overall market stability. Considering the interests of parties concerned about a firm’s impact is one way of better anticipating and managing risk.
- **Improved reputation management.** Organizations that perform well with regard to CSR can build their reputation, while those that perform poorly can

damage brand and company value when exposed. Reputation, or brand equity, is founded on values such as trust, credibility, reliability, quality and consistency. Even for firms that do not have direct retail exposure through brands, their reputation for addressing CSR issues as a supply chain partner— both good and bad—can be crucial commercially.

- **Enhanced ability to recruit, develop and retain staff.** This can be the direct result of pride in the company's products and practices, or of introducing improved human resources practices, such as "family-friendly" policies. It can also be the indirect result of programs and activities that improve employee morale and loyalty. Employees are not only front-line sources of ideas for improved performance, but are champions of a company for which they are proud to work.

- **Improved innovation, competitiveness and market positioning.** CSR is as much about seizing opportunity as avoiding risk. Drawing feedback from diverse stakeholders can be a rich source of ideas for new products, processes and markets, resulting in competitive advantages. For example, a firm may become certified to environmental and social standards so it can become a supplier to particular retailers. The history of good business has always been one of being alert to trends, innovation, and responding to markets. Increasingly, mainstream advertising features the environmental or social benefits of products (e.g., hybrid cars, unleaded petrol,¹⁴ ethically produced coffee, wind turbines, etc.).

- **Enhanced operational efficiencies and cost savings.** These flow in particular from improved efficiencies identified through a systematic approach to management that includes continuous improvement. For example, assessing the environmental and energy aspects of an operation can reveal opportunities for turning waste streams into revenue streams (wood chips into particle board, for example) and for system-wide reductions in energy use, and costs.

- **Improved ability to attract and build effective and efficient supply chain relationships.** A firm is vulnerable to the weakest link in its supply chain. Like-minded companies can form profitable long-term business relationships by improving standards, and thereby reducing risks. Larger firms can stimulate smaller firms with whom they do business to implement a CSR approach. For example, some large apparel retailers require their suppliers to comply with worker codes and standards.

- **Enhanced ability to address change.** A company with its "ear to the ground" through regular stakeholder dialogue is in a better position to anticipate and respond to regulatory, economic, social and environmental changes that may

occur. Increasingly, firms use CSR as a “radar” to detect evolving trends in the market.

- **More robust “social licence” to operate in the community.** Improved citizen and stakeholder understanding of the firm and its objectives and activities translates into improved stakeholder relations. This, in turn, may evolve into more robust and enduring public, private and civil society alliances (all of which relate closely to CSR reputation, discussed above). CSR can help build “social capital.”
- **Access to capital.** Financial institutions are increasingly incorporating social and environmental criteria into their assessment of projects. When making decisions about where to place their money, investors are looking for indicators of effective CSR management. A business plan incorporating a good CSR approach is often seen as a proxy for good management.
- **Improved relations with regulators.** In a number of jurisdictions, governments have expedited approval processes for firms that have undertaken social and environmental activities beyond those required by regulation. In some countries, governments use (or are considering using) CSR indicators in deciding on procurement or export assistance contracts. This is being done because governments recognize that without an increase in business sector engagement, government sustainability goals cannot be reached.
- **A catalyst for responsible consumption.** Changing unsustainable patterns of consumption is widely seen as an important driver to achieving sustainable development. Companies have a key role to play in facilitating sustainable consumption patterns and lifestyles through the goods and services they provide and the way they provide them. “Responsible consumerism” is not exclusively about changing consumer preferences. It is also about what goods are supplied in the marketplace, their relationship to consumer rights and sustainability issues, and how regulatory authorities mediate the relationship between producers and consumers.

2.5. STAKEHOLDERS OF CSR:

CSR can involve a wide range of stakeholders:

A corporation's stakeholders can include: shareholders, non-governmental organizations, business partners, lenders, insurers, communities, regulators, intergovernmental bodies, consumers, employees and investors.

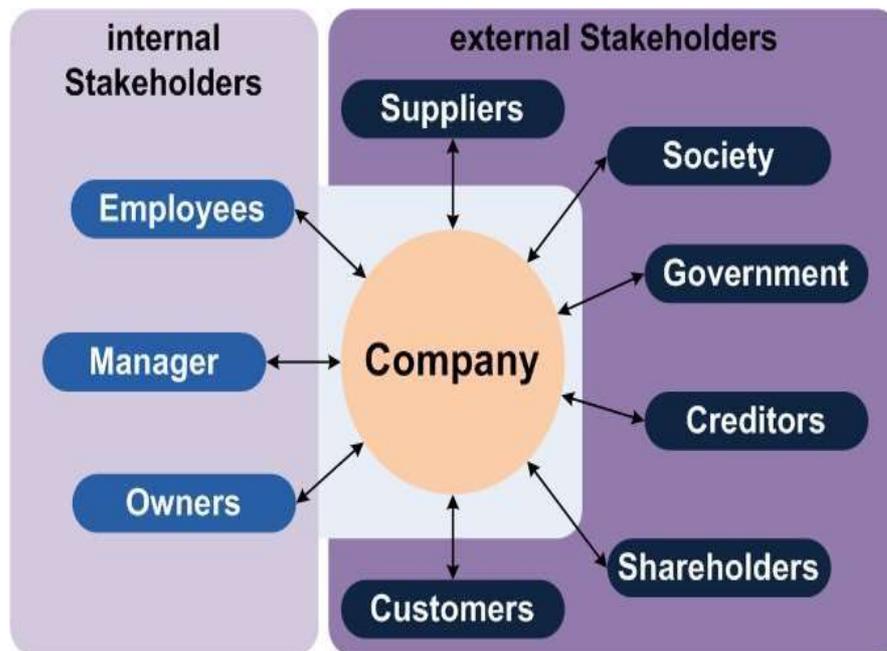


FIG.1. Stakeholders of CSR

2.6. Key CSR instruments

Human Rights:

Principle 1 - Businesses should support and respect the protection of internationally proclaimed human rights; and

Principle 2- Make sure that they are not complicit in human rights abuses.

Labour Standards:

Principle 3 - Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;

Principle 4 - The elimination of all forms of forced and compulsory labour;

Principle 5 - The effective abolition of child labour; and

Principle 6 - The elimination of discrimination in respect of employment and occupation.

Environment:

Principle 7 - Businesses should support a precautionary approach to environmental challenges;

Principle 8 - Undertake initiatives to promote greater environmental responsibility;and

Principle 9 - Encourage the development and diffusion of environmentallyfriendly technologies.

Anti-corruption:

Principle 10 -Businesses should work against all forms of corruption, including extortion and bribery.

started focusing on need-based initiatives aligned with the national priorities such as public health, education, livelihoods, water conservation and natural resource management. Intensive national level deliberations on the potential role and responsibility of the corporate sector in contributing toward addressing social issues were witnessed in the last decade. In the last five years focus on persuading companies to participate in addressing social and developmental issues, not only as a part of their social responsibility but also their business practices.

2.7. GUIDELINES ON CSR IN INDIA:

Setting an example for the private sector, guidelines regarding expenditure on CSR activities for Central Public Sector Enterprises were issued by **Department of Public Enterprises**. According to these “**Guidelines on Corporate Social Responsibility and Sustainability for Central Public Sector Enterprises**” revised by the **Department of Public Enterprises (DPE)**, Ministry of Heavy Industries and Public Enterprises every year, each CPSE shall with the approval of its Board of Directors make a budgetary allocation for CSR and Sustainability

<u>PAT OF CPSE IN THE PREVIOUS YEAR</u>	<u>RANGE OF BUDGETARY ALLOCATION FOR CSR & SUSTAINABILITY ACTIVITIES (as % of PAT in previous year)</u>
<u>Less than 100 crore</u>	<u>3%-5%</u>
<u>INR 100 crore to INR 500 crore</u>	<u>2%-3%</u>
<u>INR 500 crore & above</u>	<u>1%-2%</u>

activities/projects for the year.

Table.1. Table showing allocation of funds for CSR at different levels of PAT

Source : The revised guidelines by DPE , with effect from 1st April 2021

2.8. CSR Rules under Companies Act, 2013 ;

The Ministry of Corporate Affairs has notified **Section 135** and **Schedule VII of the Companies Act 2013** as well as the provisions of the Companies (Corporate Social Responsibility Policy) Rules, 2014 to come into effect from April 1, 2014.

With effect from April 1, 2014, every company, private limited or public limited, which either has a net worth of Rs 500 crore or a turnover of Rs 1,000 crore or net profit of Rs 5 crore, needs to spend at least 2% of its average net profit for the immediately preceding three financial years on corporate social responsibility activities. The CSR activities should not be undertaken in the normal course of business and must be with respect to any of the activities mentioned in Schedule VII of the 2013 Act. Contribution to any political party is not considered to be a CSR activity and only activities in India would be considered for computing CSR expenditure.

The net worth, turnover and net profits are to be computed in terms of **Section 198 of the 2013 Act** as per the profit and loss statement prepared by the company in terms of **Section 381 (1)(a)** and Section 198 of the 2013 Act. While these provisions have not yet been notified, it has been clarified that if net profits are computed under the Companies Act, 1956 they needn't be recomputed under the 2013 Act. Profits from any overseas branch of the company, including those branches that are operated as a separate company would not be included in the computation of net profits of a company. Besides, dividends received from other companies in India which need to comply with the CSR obligations would not be included in the computation of net profits of a company.

The CSR Rules appear to widen the ambit for compliance obligations to include the holding and subsidiary companies as well as foreign companies whose branches or project offices in India fulfill the specified criteria. There is a need for clarity with respect to the compliance obligations of a company as well as its holding and subsidiary companies.

The activities that can be undertaken by a company to fulfill its CSR obligations include eradicating hunger, poverty and malnutrition, promoting preventive healthcare, promoting education and promoting gender equality, setting up homes for women, orphans and the senior citizens, measures for reducing inequalities faced by socially and economically backward groups, ensuring environmental sustainability and ecological balance, animal welfare, protection of national heritage and art and culture, measures for the benefit of armed forces veterans, war widows and their dependents, training to promote rural, nationally recognized, Paralympics or Olympic sports, contribution to the prime minister's national relief fund or any other fund set up by the Central Government

for socio economic development and relief and welfare of SC, ST, OBCs, minorities and women, contributions or funds provided to technology incubators located within academic institutions approved by the Central Government and rural development projects. However, in determining CSR activities to be undertaken, preference would need to be given to local areas and the areas around where the company operates.

To formulate and monitor the CSR policy of a company, a CSR Committee of the Board needs to be constituted. Section 135 of the 2013 Act requires the CSR Committee to consist of at least three directors, including an independent director. However, CSR Rules exempts unlisted public companies and private companies that are not required to appoint an independent director from having an independent director as a part of their CSR Committee and stipulates that the Committee for a private company and a foreign company need have a minimum of only 2 members.

A company can undertake its CSR activities through a registered trust or society, a company established by its holding, subsidiary or associate company or otherwise, provided that the company has specified the activities to be undertaken, the modalities for utilization of funds as well as the reporting and monitoring mechanism. If the entity through which the CSR activities are being undertaken is not established by the company or its holding, subsidiary or associate company, such entity would need to have an established track record of three years undertaking similar activities.

Companies can also collaborate with each other for jointly undertaking CSR activities; provided that each of the companies is able individually report on such projects. A company can build CSR capabilities of its personnel or implementation agencies through institutions with established track records of at least three years, provided that the expenditure for such activities does not exceed 5% of the total CSR expenditure of the company in a single financial year.

The CSR Rules specify that a company which does not satisfy the specified criteria for a consecutive period of three financial years is not required to comply with the CSR obligations, implying that a company not satisfying any of the specified criteria in a subsequent financial year would still need to undertake CSR activities unless it ceases to satisfy the specified criteria for a continuous period of three years. This could increase the burden on small companies which do not continue to make significant profits. The report of the Board of Directors attached to the financial statements of the Company would also need to include an annual report on the CSR activities of the company in the format prescribed in the CSR Rules setting out inter alia a brief outline of the CSR policy, the composition of the CSR Committee, the average net profit for the last three financial years and the prescribed CSR expenditure. If the company has been unable to spend the minimum required on its CSR initiatives, the reasons for not doing so are to be specified in the Board Report.

Where a company has a website, the CSR policy of the company would need to be disclosed on such website.

Corporate India has seen in the last decade that the path towards growth is not linear. Expansion means a constant hunt for resources that go into manufacturing and invariably a conflict between man and nature.

2.9.Companies Bill 2020 and CSR

With a view to provide a framework for companies (private and public) to implement need-based CSR activities, the Government of India has included CSR-related provisions in the Companies Bill, 2012. The **Clause 135 of the Companies Bill 2012** aims at motivating companies to spend 2% of the Profit after Tax on CSR. Though spending 2% of the PAT is not mandatory but Clause 135 of the proposed Companies Bill casts a duty on the Board to specify reasons for not spending the specified amount on CSR.

The Clause 135 will be applicable to all companies that have either of the following:

- Net worth of INR 500 crores or more
- Turnover of INR 1000 crores or more
- Net profit of INR 5 crores or more

The Bill mandates companies to form a **board-level CSR Committee** comprising three or more directors with at least one independent director. The composition of the CSR Committee has to be disclosed in the annual board of director's report. The CSR Committee will be responsible for formulating and recommending a CSR policy and implementation plan. The Committee will also be responsible for regular monitoring of CSR activities. Company's board will be responsible for approving and disclosing CSR Policy in the annual Director's Report and on company's website. The Board will also be responsible for ensuring implementation of CSR activities according to the Policy.

The diagram below encapsulates the requirements of the CSR clause in the Companies Bill 2020 (clause 135):

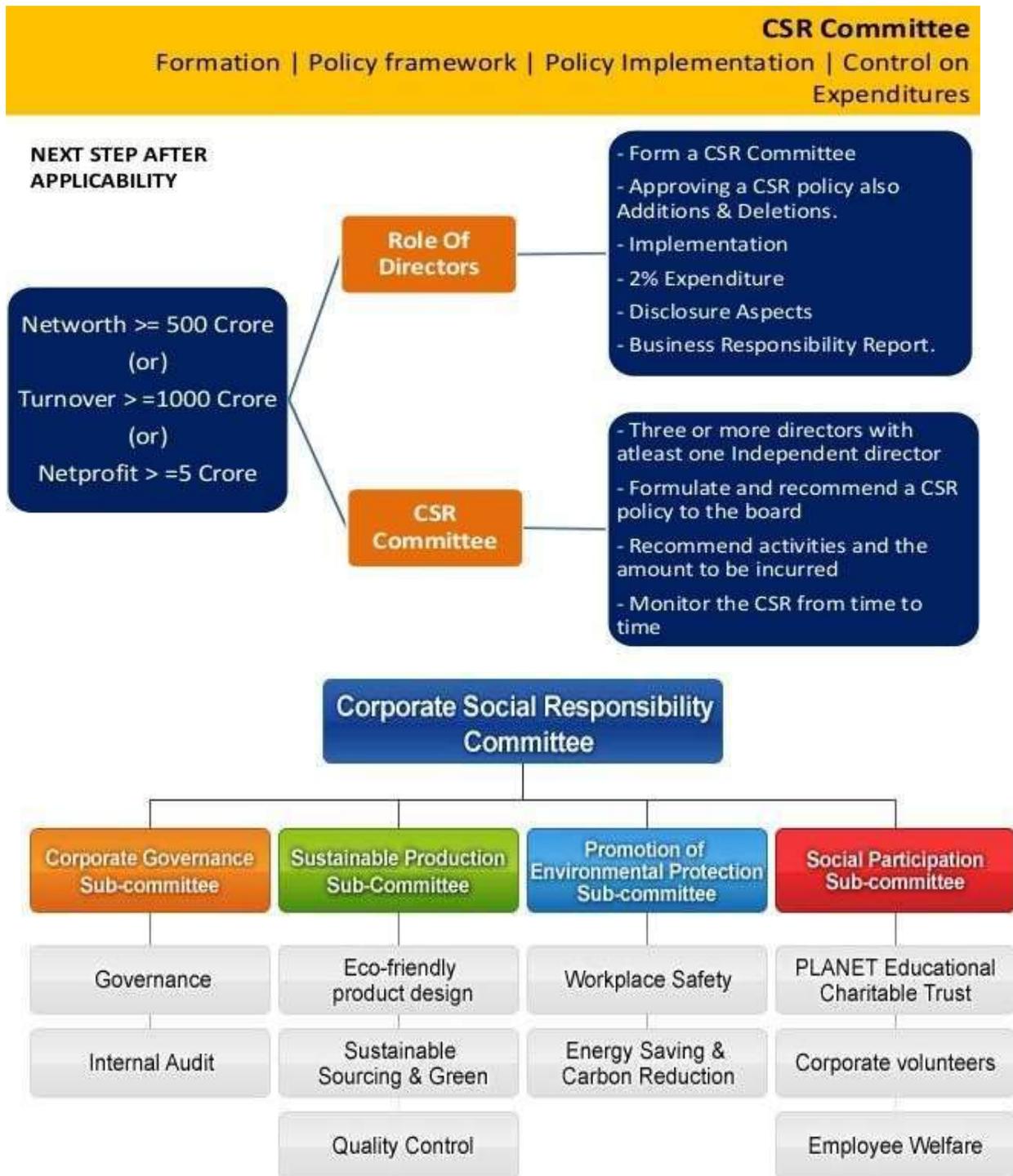


Fig.2.Formation of CSR committee & it's activities

Chapter no: 3.

DATA ,ANALYSIS AND FINDINGS

CURRENT SCENARIO : WHAT COMPANIES ARE DOING AS A PART OF CSR IN INDIA

The parameters chosen to undertake the research have been categorized broadly into — **Design, Deliver** and **Disclose**. The Design category focuses on understanding the partnership preference and the implementation mechanism for CSR activities. The Deliver category aims to identify the thematic areas that best describe the company's activities and their geographic focus. The Disclose category provides an insight on how companies are disclosing their CSR activities and sharing their learning with the public.



Covid Response

Total Spend

Rs 3.34 cr

Total Reach (Nos.)

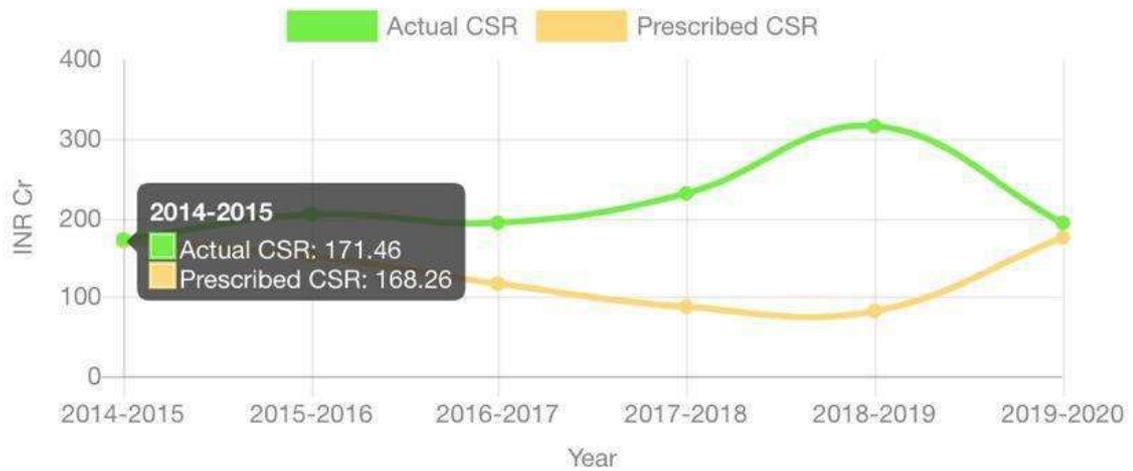
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Key Action Areas

- Extending support to tho:
- Equipping ground-zero he
- Educating masses for con and protection

CSR Financial Details (INR Cr.)

Year	2019-2020	2018-2019	2017-2018
Actual CSR	192.99 Cr	314.94 Cr	231.62 Cr
Prescribed CSR	173.53 Cr	82.40 Cr	85.62 Cr





Rural Development Projects (2019-20)

Project Budget: INR 8.66 Cr

The Company has contributed towards strategies, outcomes and prospective activities for the key obje....



Promoting Art & Culture and Preserving Heritage (2019-20)

Project Budget: INR 9.57 Cr

The Company has contributed some amount towards a vibrant Jamshedpur- Kalinganagar corridor where lo....



Promoting Sports (2019-20)

Project Budget: INR 8.16 Cr

The Company has contributed some amount towards promoting sports.....



Ensuring Environmental Sustainability Program (2019-20)

Project Budget: INR 2.76 Cr

The Company has contributed some amount towards ensuring environmental sustainability program.....

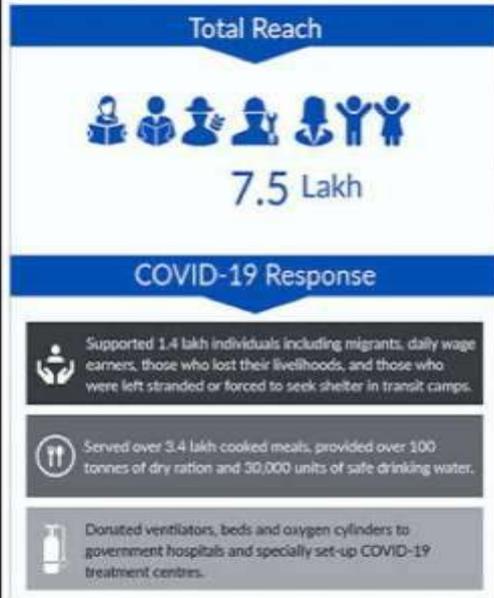


Disaster Management Activities (2019-20)

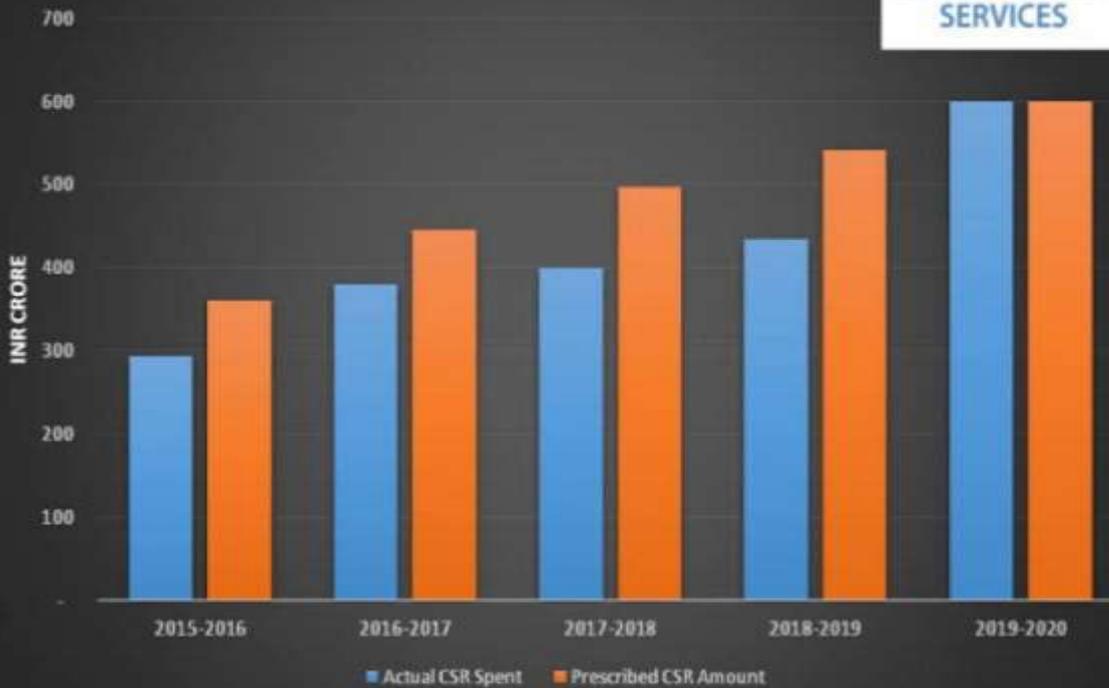
Project Budget: INR 5.88 Cr

The Company has contributed some amount towards Disaster Management activities.....

CSR Footprint @ Tata Motors- 2020-21



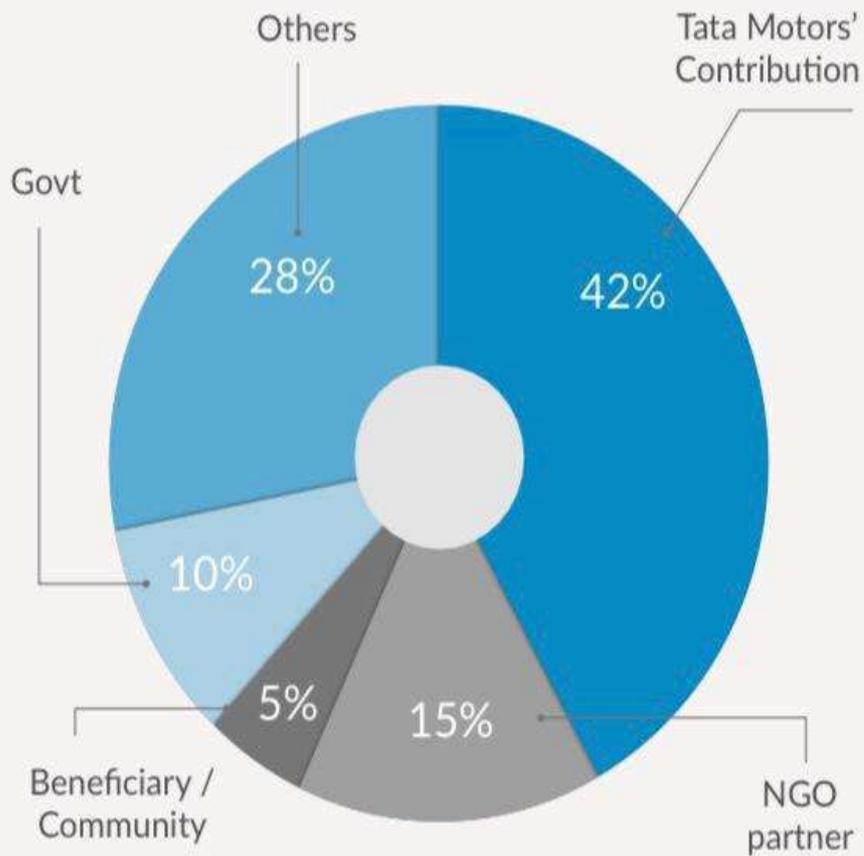
Tata Consultancy Services Prescribed and Actual CSR Spend (INR Cr.)*



TOTAL More from Less for More FY 20-21



*Based on Tata Motors' More from Less for More philosophy

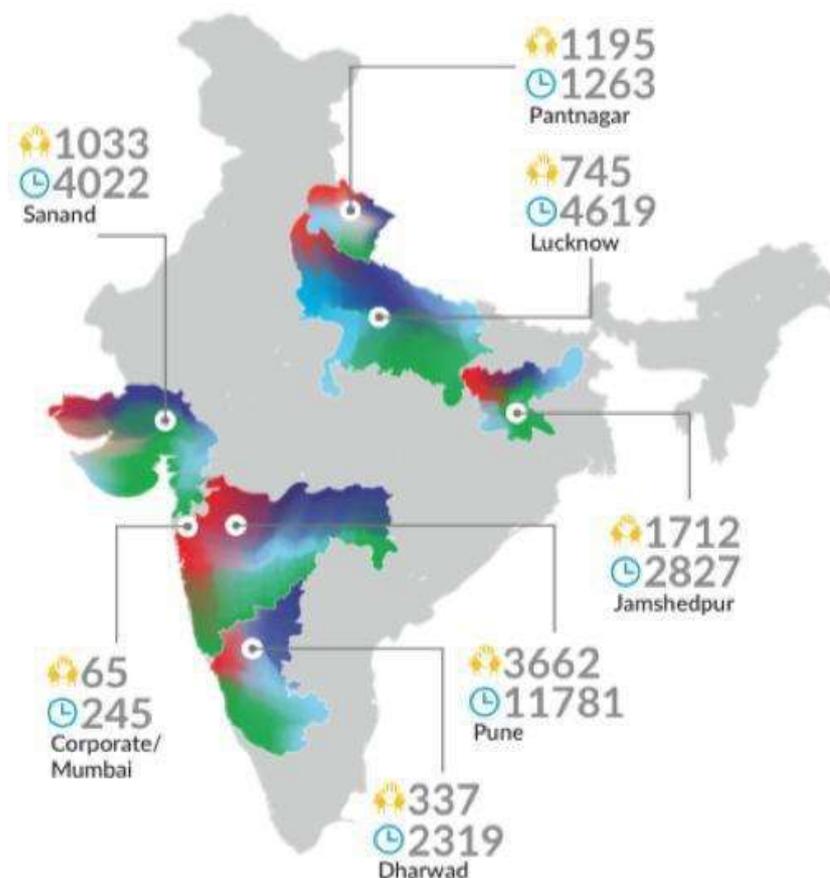


Knowledge and know-how shared

The challenges of the pandemic notwithstanding, employees of Tata Motors came out to support volunteering activities notching up a total of over 37 per cent (10, 232 of Tata Motors Employees, volunteers in 2020-21 and clocked 29011 hour for volunteering.

 **No. of Employees Volunteered**

 **Location-wise volunteering hours (Nos)**



Jamshedpur Employees in the steel city participated in 40 volunteering activities, including a unique Save Bird Life Campaign conducted by the GET Club at Jamshedpur. A Cleanliness Drive sought to areas around clean water bodies and 123 units of blood were donated besides educational institutions being supported and counseling of students.

Lucknow Senior Leaders and employees, including 30 per cent new employees, volunteered for the Company's programmes, including the Plan Head who conducted a counselling session for a rural learning center.

Mentoring and counselling sessions, session on environment, health and nutrition, etc conducted by TML employees

Dharwad Employees actively participated in a ceremony to gift scholarships to students of Govt. High School Narendra, donated blood to the District Civil Hospital Dharwad, National Red Cross Society and Navanagar Cancer Hospital; created awareness on the COVID-19 vaccine

at Karadigudda village and on Cervical Cancer at Kotur village prior to which employees had visited the homes of villagers and distributed pamphlets to encourage women to participate in the free check-up camp.

Pune 300 girls selected from rural areas as Vidyadhanam Scholars were mentored one-on-one by employees at Pune, who also reached out to communities to seek feedback from the families under Help Assess Impact on undernourished children in their homes. Seeds donated by employees were used to raise saplings for the plantation drive under Vasundhara. Employees helped develop managerial skills in the staff of 500 empaneled NGOs across the country through Partner Agency Connect sessions.

Sanad Awareness on Covid Vaccine, a de-addiction drive among communities, mask distribution, Cleanliness Drive by 35 employees across departments and a Plantation Drive for saplings were the key volunteering activity at this plant.

COMPANY PROFILE



In this part I have provided the analysis of **CORPORATE SOCIAL RESPONSIBILITY of one of** the most prestigious and reputed group of companies of our country.

Ranging from steel, automobiles and software to consumer goods and telecommunications the **Tata Group** operates more than **80 companies** . It has around 200,000 employees across India and thus has the pride to be nation's largest private employer.

Mr. Ratan N. Tata has led the eminent Tata Group successfully. He was trained as an architect at New York's Cornell University but he chose to enter the family business .He assumed the Chairmanship of the Group in 1991.

Named Business Man of the Year for Asia by Forbes in 2004, Mr. Ratan Tata serves on the board of the Ford Foundation and the program board of the Bill & Melinda Gates Foundation's India AIDS initiative.

Approximately two third of the equity of the parent firm, Tata Sons Ltd., is held by philanthropic trusts endowed by **Sir Dorabji Tata** and Sir Ratan Tata, sons of **Jamsetji Tata**, the founder of today's Tata empire in the 1860s. Through these trusts, Tata Sons Ltd. utilizes on average between 8 to 14 percent of its net profit every year for various social causes.

Even when economic conditions were adverse, as in the late 1990s, the financial commitment of the group towards social activities kept on increasing, from Rs 670 million in 1997-98 to Rs 1.36 billion in 1999-2000. In the fiscal year 2004 Tata Steel alone spent Rs 45 crore on social services.

Tata is accredited to initiate various labor welfare laws. For example- the establishment of Welfare Department was introduced in 1917 and enforced by law in 1948; Maternity Benefit was introduced in 1928 and enforced by law in 1946. A pioneer in several areas, the Tata group has got the credit of pioneering India's steel industry, civil aviation and starting the country's first power plant. It had the world's largest integrated tea operation. It is world's sixth largest manufacturer of watches (Titan).

Recognition of CSR IN TATA

"In a free enterprise, the community is not just another stakeholder in business but is in fact the very purpose of its existence."

- Jamsetji Nusserwanji , Tata Founder, Tata Group.

"Corporate Social Responsibility should be in the DNA of every organization. Our processes should be aligned so as to benefit the society. If society prospers, so shall the organization..."

-Manoj Chakravarti,

G M - Corporate Affairs & Corporate Head - Social Responsibility, Titan Industries Limited in 2004.

Corporate Social Responsibility has always been taken care of by the Tata group. The founder **Mr. Jamshedji Tata** used to grant scholarships for further studies abroad in 1892 . He also supported **Gandhiji's campaign** for racial equality in South Africa .

Tata group has given country its first science center and atomic research center .

"The wealth gathered by Jamsetji Tata and his sons in half a century of industrial pioneering formed but a minute fraction of the amount by which they enriched the nation.

Jamshed Irani, Director, Tata Sons Ltd, says,

"The Tata credo is that 'give back to the people what you have earned from them'.

So from the very inception, Jamshetji Tata and his family have been following this principle." (a statement on the Tata group's website www.tata.com) .

In July 2004, **B. Muthuraman**, Managing Director, Tata Steel Limited (TISCO) announced that in future TISCO would not deal with companies, which do not conform to the company's Corporate Social Responsibility (CSR) standards.

Speaking at the annual general meeting of the Madras Chamber of Commerce and Industry, He stated, "We will not either buy from or sell to companies that do not measure up to Tata Steel's social responsibility standards."

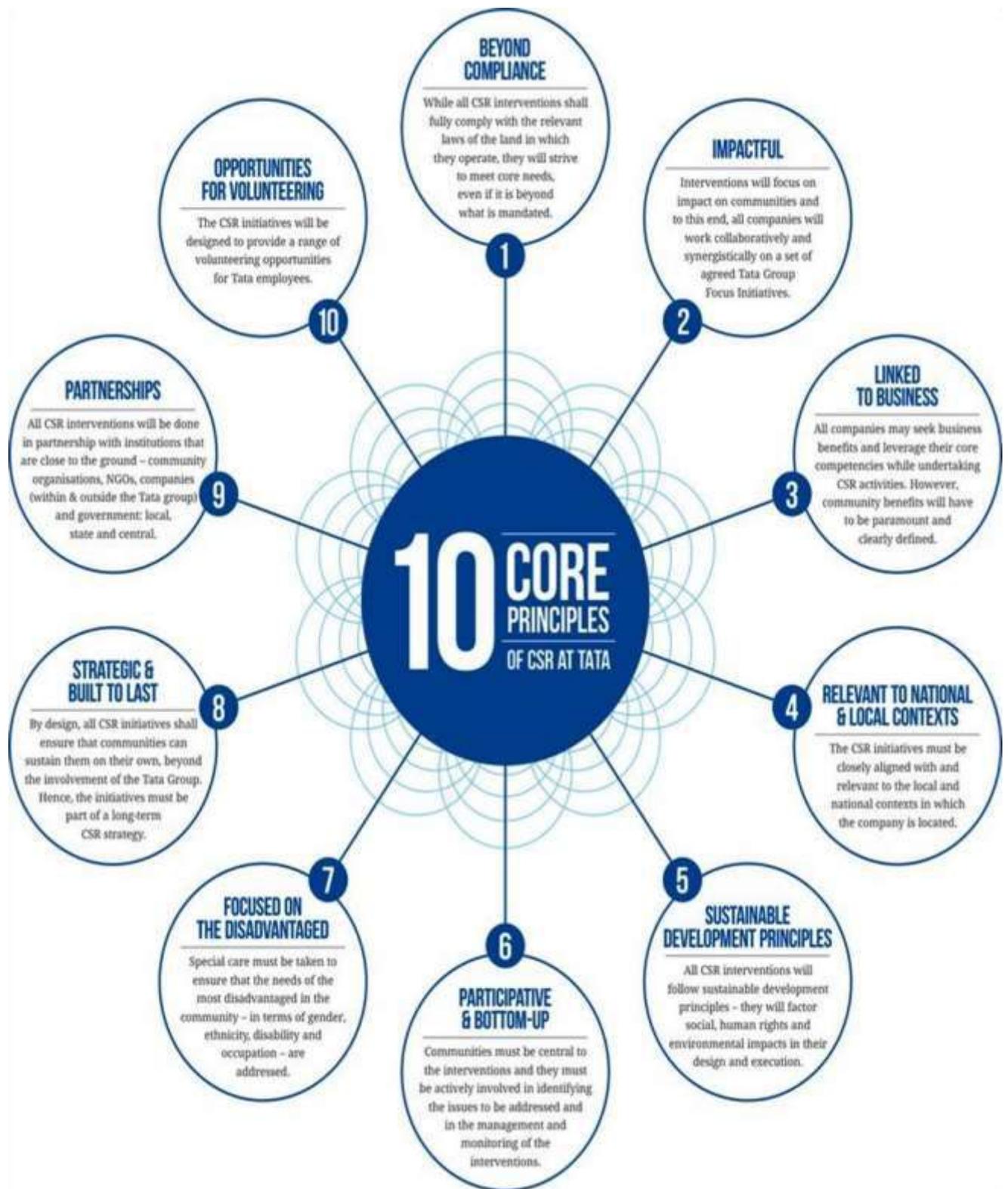


FIG.8.10 CORE PRINCIPLES OF CSR IN TATA

CSR Activities of Tata Companies & Societies

Through the following companies and societies Tata group keeps on heading towards the fulfillment of corporate social responsibility

Tata Steel

Tata Steel has adopted the Corporate Citizenship Index, Tata Business Excellence Model and the Tata Index for Sustainable Development. Tata Steel spends 5-7 per cent of its profit after tax on several CSR initiatives.

(a) Self-Help Groups (SHG's)

Over 500 self-help groups are currently operating under various poverty alleviation programs; out of which over 200 are engaged in activities of income generation through micro enterprises. Women empowerment programs through Self-Help Groups have been extended to 700 villages. From the year 2003 to 2006, the maternal and infant survival project had a coverage area of 42 villages in Gamharia block in Seraikela Kharsawa and a replication project was taken up in Rajnagar block. For providing portable water to rural communities 2,600 tube wells have been installed for the benefit of over four Lakh people.

(b) Supports Social Welfare Organizations

Tata Steel supports various social welfare organizations. They include;

- ✓ Tata Steel Rural Development Society
- ✓ Tribal Cultural Society
- ✓ Tata Steel Foundation for Family Initiatives
- ✓ National Association for the Blind
- ✓ Shishu Niketan School of Hope
- ✓ Centre for Hearing Impaired Children
- ✓ Indian Red Cross Society, East Singhbhum

(c) Healthcare Projects In its 100th year, the Tata Steel Centenary Project has just been announced. The healthcare projects of Tata Steel include facilitation of child education, immunization and childcare, plantation activities, creation of awareness of AIDS and other healthcare projects.

(d) Economic Empowerment A program aiming at economic empowerment through improvised agriculture has been taken up in three backward tribal blocks

in Jharkhand, Orissa and Chhattisgarh. An expenditure of Rs 100 crore has been estimated for the purpose and this program is expected to benefit 40,000 tribal living in over 400 villages in these three States.

(e) Assistance to government Tata Steel has hosted 12 Lifeline Expresses in association with the Ministry of Railways, Impact India Foundation and the Government of Jharkhand. It has served over 50,000 people. Five thousand people have got surgical facilities and over 1,000 people received aids and appliances. Over seven lac rural and another seven Lac urban population have been benefited by the CSR activities of Tata Steel. The National Horticulture Mission program that has been taken up in collaboration with the Government of Jharkhand has benefited more than a thousand households. In collaboration with the Ministry of Non Conventional Energy and the Confederation of Indian Industry, focus is laid on renewable energy aiming at enhancing rural livelihood.

Tata Motors :

(a) Pollution Control

Tata Motors is the first Indian Company to introduce vehicles with Euro norms. Tata Motors' joint venture with Cummins Engine Company, USA, in 1992, was a major effort to introduce emission control technology in India. To make environment friendly engines it has taken the help of world-renowned engine consultants like Ricardo and AVL. It has manufactured CNG version of buses and also launched a CNG version of its passenger car, the Indica. Over the years, Tata Motors has also made investments in the establishment of an advanced emission-testing laboratory.

(b) Restoring Ecological Balance

Tata Motors has planted 80,000 trees in the works and the township and more than 2.4 million trees have been planted in Jamshedpur region. Over half a million trees have been planted in the Poona region. The company has directed all its suppliers to package their products in alternate material instead of wood. In Pune, the treated water is conserved in lakes attracting various species of birds from around the world.

(c) Employment Generation

Relatives the employees at Pune have been encouraged to make various industrial co-operatives engaged in productive activities like re-cycling of scrap wood into furniture, welding, steel scrap baling, battery cable assembly etc. The Tata Motors Grihini Social Welfare Society assists employees' women

dependents; they make a variety of products, ranging from pickles to electrical cable harnesses etc ; thereby making them financially secure.

(d) Economic Capital

In Lucknow, two Societies - Samaj Vikas Kendra & Jan Parivar Kalyan Santhan have been formed for rural development & for providing healthcare to the rural areas. These societies have made great efforts for health, education and women empowerment in rural areas.

(e) Human Capital

Tata motors has introduced many scholarship programs for the higher education of the children. Through a scholarship program Vidyadhanam, the company supports 211 students. Out of these students 132 students are from the marginalized sections of the society. These students get books, copies and other study materials. They also undergo different kinds of workshops, creative & outdoor sessions and residential camps as well. The company has entered into Public-Private Partnership (PPP) for upgrading 10 Industrial Technical Institutes (ITI) across the country.

(f) Natural Capital

On the World Environment Day, Tata Motors has launched a tree plantation drive across India and countries in the SAARC region, Middle East Russia and Africa. As many as 25,000 trees were planted on the day. Apart from this more than 100,000 saplings were planted throughout the monsoon.

Tata Chemicals Ltd (TCL)

Tata Chemicals is making an effort for sustainability. Sustainability for the group means honesty and transparency towards stakeholders, environmental protection , generating economic value, promoting human rights and creating social capital. Tata Chemicals supports the UN Global Compact and is committed to reporting its sustainability performance in accordance with GRI (Global Reporting Initiatives) guidelines. The company runs a rural development program at Okhamandal and Babrala. Tata Chemicals Limited was one of the first organizations to hold an Impact camp, which was held at Mithapur in the year 1982, providing eye care to hundreds of patients at the Mithapur Hospital. Tata Chemicals Limited was also the first organization to run world's first hospital on wheels - the Life Line Express, through Jamnagar district for the first time between November 21, 2004 and December 21, 2004.

Titan

Corporate social responsibility is a basic element of TITAN Group's governing objective and one of its corporate values. In its corporate philosophy CSR is defined as doing less harm and more good by adopting the following practices :

- ✓ Respecting and supporting local communities
- ✓ Caring for the employees
- ✓ Being an active member of society
- ✓ Committed to sustainable development
- ✓ Putting safety(at work) first

TISCO

TISCO was awarded The Energy Research Institute (TERI) award for Corporate Social Responsibility (CSR) for the fiscal year 2002-03 in recognition of its corporate citizenship and sustainability initiatives. As the only Indian company trying to put into practice the Global Compact principles on human rights, labor and environment, TISCO was also conferred the Global Business Coalition Award in 2003 for its efforts in spreading awareness about HIV/AIDS.

Tata Consultancy Services (TCS)

TCS aims at the Tata group's philosophy of building strong sustainable businesses community .The elements that make for strong corporate sustainability at TCS include the following: A fair, transparent corporate governance , a strong strategy for long-term growth ,Best-in-class HR processes , initiatives for community betterment and welfare. In 2010-11, TCS supported its local communities in the United States: supported the victims of the 2010 Chilean earthquake, conducted IT educational programs for high school students in Cincinnati , raised support and awareness for diabetes prevention through a series of marathon sponsorships Tata Consultancy Services runs an adult literacy program. Indian government launched Saakshar Bharat, an adult education programe in 2009 and the programe will now go online via TCS' partnership. The scheme, aimed at female

literacy aims to make literate 70 million people, of which at least 85 percent are women literate and the program has already been rolled out in 167 districts across 19 states.

Tata Relief Committee

Tata Relief Committee (TRC) works to provide relief at disaster affected areas. During natural calamities there are two phases of assistance - (a) relief measures and (b) rehabilitation program. After the Gujarat earthquake the group built 200 schools in two years and they rendered help during the Orissa floods when people lost cattles. Even after the Tsunami disaster members of TRC immediately reached the places and supplied the things required.

Tata Council for Community Initiatives (TCCI)

TCCI was established in 1994 . TCCI's mission states: "We will work together to be, and to be seen as, a group which strives to serve our communities and the society at large". TCCI is also involved in assisting Tata companies maintain sustainability reporting the guidelines of Global Reporting Initiative (GRI). It is the focal point for the UN Global Compact in India, which has 42 Tata companies as signatories, the highest in the world from a single business group.

In collaboration with the United Nations Development Programme (India), TCCI has crafted the Tata Index for Sustainable Human Development , aiming at directing, measuring and enhancing the community work that Tata enterprises is undertaking for the upliftment and welfare of the people.

Tata Corporate Sustainability Policy "No success or achievement in material terms is worthwhile unless it serves the needs or interests of the country and its people. - J R D Tata

Dedications to the Nation at a Glance

- ✓ Tata Health Infrastructure
- ✓ Tata main hospital at Jamshedpur
- ✓ ICU in Joda and Balangpur
- ✓ CHC in Bari and Kuhika
- ✓ Hospitals in Gobarghati,sukinda, joda, belpahar, belipada and bamnipal
- ✓ Lifeline Express||- the hospital on wheels
- ✓ Mobile health clinics

- ✓ Centre for hearing impaired children

Tata Educational Infrastructure

- ✓ Institute of mathematics
 - ✓ Sukinda college
 - ✓ Joda college centenary Learning centre at XIMB
 - ✓ J N Tata Technical Education centre
 - ✓ School of hope
 - ✓ Shishu Niketan
-
- ✓ Balwadi schools assisted by Tata Steel

Tata Sports Infrastructure

- ✓ Tata athletics academy
- ✓ Tata archery academy
- ✓ Tata Football academy
- ✓ Tata steel adventure foundation
- ✓ Sports feeder centres
- ✓ Stadium at keonjhar

CHAPTER NO. : 4

CONCLUSION AND

RECOMMENDATIONS

4.1 CONCLUSION

While successfully completing this project , I have identified that Corporate Soc

No company in this world contributes towards the society without keeping in mind the objective of Project Maximisation. When a company contributes a part of their profit towards the society , they also create a brand value of their own name.

During the analysis, it is found that there are four areas where tata group of companies have performed excellent in Social Responsibility and these four areas got 'A' grade. These areas are Health, Education, CommunityWelfare and Environment and their PSSR is 84.62%, 83.33%, 73.08% and 70.51% respectively. Moreover it is found that four areas where companies have performed satisfactory in Social Responsibility and these four areas got B' grade. These areas are Human Resource Development, Safety, Infrastructure and Charity and their PSSR is 43.59%, 39.74%, 38.46% and 35.90% respectively. Apart fromthat it is found that there are six areas where companies have performed poor inSocial Responsibility and these four areas got 'C' grade. These areas are Quality, Employment, Agriculture, Art &Cultural, Sports and Beauty and their PSSR is 19.23%, 14.10%, 14.10%,

4.2RECOMMENDATIONS

Various recommendations has come to my mind while doing thisproject,

- Adequate monitoring of recent implementations and their

disclosure in financial statements will help in maintaining a transparency of the company.

- The selection of area of corporate social responsibility must be need based.
- The choice of selection of corporate social responsibility must be based on requirement of respective geographical area of the states or nations.
- The detailed study on economic, social, medical, transport, education problems and other areas must be undertaken and all companies should work in those areas.
- The central and state government should provide some incentive to those companies which perform their duties for social responsibility.
- India is considered as young country. The young population is very significant. Thus India has to focus on problem like education and health. These two components would enhance economic status of the country. Another important area of corporate social responsibility is environment. The protection of environment will be the gift to the next generation.

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A STUDY ON IMPACT OF COVID-19 ON E
COMMERCE: A CASE STUDY OF
FLIPKART

**(SUBMITTED FOR THE PARTIAL FULFILMENT OF
REQUIREMENT OF DEGREE OF M.COM IN ACCOUNTS AND
FINANCE)**

SUBMITTED BY:

SUSHMA KUMARI

Registration Number:1071921401411

College Roll Number: 102

SUPERVISED BY:

MR VIJAY ANAND SAH

MONTH AND YEAR OF SUBMISSION: 13th SEPTEMBER 2021

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I am highly indebted to MR Vijay Anand Sah Sir for his guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project. I came to know about so many new things.

At last, but not the least I would like to thanks my family and friends who helped me a lot in finalizing this project within the limited time frame.

Submitted By:
SUSHMA KUMARI

Supervisor's Certificate

This is to certify that Ms. SUSHMA KUMARI a student of MASTER DEGREE OF COMMERCE in Accounting & Finance of BHAIRAB GANGULLY COLLEGE under the University of WEST BENGAL has worked under my supervision and guidance for her Project Work and prepared a Project Report with the title **“A Study on Impact Of Covid 19 on E-commerce: A case study of Flipkart”** which she is submitting, is her genuine and original work to the best of my knowledge.

DATE:

PLACE:

SIGNATURE:

Student's Declaration

I hereby declare that the Project Work with the title “**A Study on Impact Of Covid 19 on E-commerce: A case study of Flipkart**” submitted by me for the partial fulfilment of the Master degree of Commerce in Accounting & Finance under the University of West Bengal is my original work and has not been submitted earlier to any other University /Institution for the fulfilment of the requirement for any course of study. I also declare that no chapter of this manuscript in whole or in part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the references.

Name:

Registration:

Signature:

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CHAPTER 1 - INTRODUCTION

The term E-COMMERCE means Electronic Commerce. The term E-commerce was coined back in the 1960s, with the rise of electronic commerce – the buying and selling of goods through the transmission of data – which was made possible by the introduction of the electronic data interchange. Fast forward fifty years and **e-commerce has changed the way in which society sells goods and services.**

Business transaction that involve the exchange of money are covered by the term e-commerce. E-business includes all aspects of running a business that sells goods and services, including marketing, earning and retaining customers, procurement, developing business partners and customers education. In order to be successful, e-commerce and e-businesses must have quality storefronts that are simple to navigate and peruse, with accurate and thorough catalogue information. E- business became an extension of e-commerce to encompass all aspects of business became an extension of e-commerce, but E-commerce does not cover all aspects of e-business.

Need of the study:

Nowadays retails stores are facing more competition in the retail business. Good stores design increasing the more visitors to the stores and increase the goodwill of the store and also plays major role to use customer giving preferences and selection of the store. And as industry research has shown ,there is much need to know the customer expectation, customer

preferences and store choices and we will find out the solutions for designing effective stores which will getting more customers and getting more profits.

Review of literature:

Keywords search on “E-commerce adoption in India” “e- business in India” “E-commerce and India” and e-business and India” in various database like EBSCO, ProQuest, and Emerald Management extra found the following ten

Ecommerce /e-business research articles done in Indian context

Raven et al. compared Indian and China’s approach in adoption of e-business. Based on the literature survey and secondary data , the study analysed various factors influencing the growth of e-business in two countries. The factors examined include government policy and focus, existing technology infrastructure regulatory environment, experience and understanding of business operations, and culture, among others.

Malhotra and singh studied the determinants of Internet banking adoption by banks in India. Patel data of 88 banks in India covering the financial years 1997-1998 to 2004-2005 was collected through CMIE (centre for monitoring Indian economy) database. Logistic regression analysis was used, the dependent variable is categorical with a value of 1 if the bank adopted Internet banking during the study period and 0 otherwise.

Study by Tarafdar and Vaidya examined the factor that determine the organisation inclination on adopt E-commerce (EC). The study propose a framework based on the qualitative data on four financial firms in India collected through multiple case study design. Face to face interviews was used to collect primary data and existing database, company documents, press reports and websites are used to collect primary data and existing database, company documents, press reports and websites are used to collect secondary data.

Viswanathan and Pick examined the issue of e-commerce in India and Mexico from the framework of developing countries as suggested by Tallon and Kramer. The framework included critical factors that might impact the diffusion of e-commerce.

OBJECTIVES OF THE STUDY:

- To know the status of E-commerce worldwide.
- To know the impact of covid 19 on the market of E commerce.
- Finding out the customers satisfaction and awareness of Flipkart.
- Finding the perception among the competitors.

LIMITATIONS OF THE STUDY

It's not possible for every market study to make it accurate due to many hurdles in the collections and computation of data. Some limitations of the study are:

- The sampling frame to conduct the study has been restricted to the area of TOLLYGUNGE South Kolkata.
- Respondents shows reluctance towards giving correct information.
- Findings are based on the assumptions that has been described by the respondents in the Questionnaire.
- Time was a major constraints.

CHAPTER 2 - Conceptual Framework

‘E-commerce’ and ‘online shopping’ are often used interchangeably but at its core e-commerce is much broader than this – it **embodies a concept for doing business online**, incorporating a multitude of different services e.g. **making online payments, booking flights etc.**

E-commerce has **experienced rapid growth since its humble beginnings** with e-commerce sales projected to grow to 599.2 billion USD by 2024. The COVID-19 outbreak saw e-commerce sales spike 25% in March 2020 alone. The power of e-commerce should not be underestimated as it continues to pervade everyday life and present significant **opportunities** for small, medium, and large businesses and online investors. We don’t need to look far to see the potential of e-commerce businesses. Amazon, for example, which set the standard for customer-orientated websites as well as a lean supply chain, is selling over 4000 items a minute from SMBs alone.

HISTORY AND TIMELINE

The term was coined and first employed by **Dr. Robert Jacobson**, Principal Consultant to the California State Assembly's Utilities & Commerce Committee, in the title and text of California's Electronic Commerce Act, carried by the late Committee Chairwoman Gwen Moore (D-L.A.) and enacted in 1984.

A timeline for the development of e-commerce:

- 1971 or 1972: The ARPANET is used to arrange a cannabis sale between students at the Stanford Artificial Intelligence Laboratory and the Massachusetts Institute of Technology, later described as "the seminal act of e-commerce" in John Markoff's book *What the Dormouse Said*.
- 1979: Michael Aldrich demonstrates the first online shopping system.
- 1981: Thomson Holidays UK is the first business-to-business (B2B) online shopping system to be installed.
- 1982: Minitel was introduced nationwide in France by France Télécom and used for online ordering.
- 1983: California State Assembly holds first hearing on "electronic commerce" in Volcano, California. Testifying are CPUC, MCI Mail, Prodigy, CompuServe, Volcano Telephone, and Pacific Telesis. (Not permitted to testify is Quantum Technology, later to become AOL.) California's Electronic Commerce Act was passed in 1984.
- 1984: Gateshead SIS/Tesco is first B2C online shopping system and Mrs Snowball, 72, is the first online home shopper
- 1984: In April 1984, CompuServe launches the Electronic Mall in the US and Canada. It is the first comprehensive electronic commerce service.
- 1989: In May 1989, Sequoia Data Corp. Introduced Compumarket, the first internet based system for e-commerce. Sellers and buyers could post items for sale and buyers could search the database and make purchases with a credit card.

- 1990: Tim Berners-Lee writes the first web browser, WorldWideWeb, using a NeXT computer.
- 1992: Book Stacks Unlimited in Cleveland opens a commercial sales website (www.books.com) selling books online with credit card processing.
- 1993: Paget Press releases edition No. 3 of the first app store, The Electronic AppWrapper
- 1994: Netscape releases the Navigator browser in October under the code name Mozilla. Netscape 1.0 is introduced in late 1994 with SSL encryption that made transactions secure.
- 1994: Ipswitch IMail Server becomes the first software available online for sale and immediate download via a partnership between Ipswitch, Inc. and OpenMarket.
- 1994: "Ten Summoner's Tales" by Sting becomes the first secure online purchase through NetMarket.
- 1995: The US National Science Foundation lifts its former strict prohibition of commercial enterprise on the Internet.
- 1995: Amazon.com is launched by Jeff Bezos.
- 1995: eBay is founded by computer programmer Pierre Omidyar as AuctionWeb. It is the first online auction site supporting person-to-person transactions.
- 1995: The first commercial-free 24-hour, internet-only radio stations, Radio HK and NetRadio start broadcasting.
- 1996: The use of Excalibur BBS with replicated "Storefronts" was an early implementation of electronic commerce started by a group of SysOps in Australia and replicated to global partner sites.
- 1998: Electronic postal stamps can be purchased and downloaded for printing from the Web.
- software Napster launches. ATG Stores launches to sell decorative items for the home online.
- 1999: Global e-commerce reaches \$150 billion.
- 2000: The dot-com bust.
- 2001: eBay has the largest userbase of any e-commerce site.
- 2002: eBay acquires PayPal for \$1.5 billion. Niche retail companies Wayfair and Net Shops are founded with the concept of

selling products through several targeted domains, rather than a central portal.

- 2003: Amazon.com posts first yearly profit.
- 2004: DHgate.com, China's first online B2B transaction platform, is established, forcing other B2B sites to move away from the "yellow pages" model.
- 2007: Business.com acquired by R.H. Donnelley for \$345 million.
- 2014: US e-commerce and Online Retail sales projected to reach \$294 billion, an increase of 12 percent over 2013 and 9% of all retail sales. Alibaba Group has the largest Initial public offering ever, worth \$25 billion.
- 2015: Amazon.com accounts for more than half of all e-commerce growth, selling almost 500 Million SKU's in the US.
- 2017: Retail e-commerce sales across the world reaches \$2.304 trillion, which was a 24.8 percent increase than previous year.
- 2017: Global e-commerce transactions generate \$29.267 trillion, including \$25.516 trillion for business-to-business (B2B) transactions and \$3.851 trillion for business-to-consumer (B2C) sales

BUSINESS APPLICATIONS

Some common business applications are:

- B2B e-commerce (business-to-business)
- B2C e-commerce (business-to-consumer)
- Conversational commerce: e-commerce via chat
- Digital Wallet
- Document automation in supply chain and logistics
- Electronic tickets
- Enterprise content management
- Group buying
- Pretail
- Print on demand
- Social networking

- Teleconference
- Usenet newsgroup
- Virtual assistant
- Domestic and international payment systems

GOVERNMENT REGULATION WORLD WIDE

- In the **United States**, California's Electronic Commerce Act (1984), enacted by the Legislature, and the more recent California Privacy Act (2020) enacted through a popular election proposition, control specifically how electronic commerce may be conducted in California. In the US in its entirety, electronic commerce activities are regulated more broadly by the Federal Trade Commission (FTC). These activities include the use of commercial e-mails, online advertising and consumer privacy.
- In **Australia**, Trade is covered under Australian Treasury Guidelines for electronic commerce and the Australian Competition & Consumer Commission¹ regulates and offers advice on how to deal with businesses online, and offers specific advice on what happens if things go wrong.
- In the **United Kingdom**, The Financial Services Authority (FSA) was formerly the regulating authority for most aspects of the EU's Payment Services Directive (PSD), until its replacement in 2013 by the Prudential Regulation Authority and the Financial Conduct Authority. The UK implemented the PSD through the Payment Services Regulations 2009 (PSRs), which came into effect on 1 November 2009.
- In **India**, the Information Technology Act 2000 governs the basic applicability of e-commerce.

- In **China**, the Telecommunications Regulations of the People's Republic of China (promulgated on 25 September 2000), stipulated the Ministry of Industry and Information Technology (MIIT) as the government department regulating all telecommunications related activities, including electronic commerce. On the same day, The Administrative Measures on Internet Information Services released, is the first administrative regulation to address profit-generating activities conducted through the Internet, and lay the foundation for future regulations governing e-commerce in China.

CHAPTER 3: E-COMMERCE IN INDIA

India has an Internet user base of about 696.77million as of May 2020, about 40% of the population. Despite being the second-largest user base in world, only behind China (650 million, 48% of population), the penetration of e-commerce is low compared to markets like the United States (266 million, 84%), or France (54 M, 81%). In India, cash on delivery is the most preferred payment method, accumulating 75% of the e-retail activities.

▪ GROWING DEMAND

- India s E-commerce Order volume increased by 36% in the last quarter of 2020 with the personal care, beauty and wellness being the largest beneficiary.
- Tier 2 and3 cities accounted for a 90% YOY incremental volume and value growth in e-commerce market in the last quarter of 2020. Also these cities reported significant shares in the overall E- Commerce sale volume from 32% to 46% and from 26% to 43% in the last quarter of 2020 over the same period last year.

ATTRACTIVE OPPORTUNITIES:

- Despite depressed consumer spending economic slowdown and uncertainty created due to COVID -19 E commerce players are expecting high growth in the year 2021.

- Online grocery and pharmacy are also expecting a huge bulk of sale in the year 2021.

POLICY SUPPORT

- 100% FDI is allowed in B2B E commerce.
- 100% FDI is allowed under the automatic route in the market place model of E commerce.

INCREASING INVESTMENT

- **The** recent rise in digital literacy has led to an influx of Investment in E commerce firms.

1. ADVANTAGES OF E COMMERCE

- **SAVES TIME:** Online shopping saves us a lot of time. We can buy any of our favourite products from home only.
- **COST EFFECTIVE:** The products can be brought at much discounted rate through shopping online. This is because online offers huge discounts and lucrative products.
- **OTHER FACILITIES:** The goods are freely and directly delivered at our doorstep without any extra charge. Moreover if we don't like them we can return it any time without purchasing it.

- **SHOP ANY STORE WORLDWIDE** : Never again be limited geographically .Many merchants don't have physical stores in every state and certainly not in every country. When you shop online you can browse through stores around the block or around the globe.
- **SHIPS YOUR GIFTS DIRECTLY**: When you order online u can deliver gifts or even have gifts at their doorstep at any time or even receive them at our door steps. It means you can avoid a long waits at the post office and you can delivered it fast.

2. MARKET SIZE AND GROWTH: The ecommerce industry was reported at \$24 billion in 2017 and was recognised as the fastest growing industry in India. The ecommerce market grew to \$38.5 billion in 2018. It is estimated that one in every three Indian shops via smartphone and online retailers deliver to 20,000 pin-codes out of the 100,000 pin-codes in India. As per Goldman Sach, India's e-commerce industry will reach \$99 billion in size while online retail is expected to more than double to around 11% by 2024 from 4.7% in 2019 while increasing at 27% compound annual growth rate (CAGR). The online grocery segment that is below \$2 billion will reach \$29 billion in size by 2024. Online grocery orders will grow from 3,00,000 per day in 2019 to more than 5 million per day by 2024. Non grocery eCommerce penetration will be 16.1 percent by 2021.

STATUS OF E-COMMERCE DURING COVID 19

⋮

The demand for warehousing of 5,000 to 10,000 square feet size will increase due to COVID-19 lock-downs which lead to a surge in online orders of essential items for same day delivery especially in tier-1

cities like Mumbai, Kolkata, Bengaluru, Chennai and New Delhi. Flipkart will debut a hyperlocal service called Flipkart Quick in Bengaluru to start 90 minutes deliveries. Amazon observed spike in page views with four times increase in “Add to Cart” during the lockdown, leading to doubling of sales. It also started selling auto insurance in partnership with Acko General Insurance which is available to users through Amazon app and mobile website. With opening of 10 new warehouse, the count of Amazon warehouse in India stands at 60 across 15 states that has an area equivalent to more than 100 football fields.

The worldwide spread of the COVID-19 pandemic has disrupted how people buy products and services and how they perceive e-commerce. The standardized lockdown rules across India and the growing hesitation among consumers to go outside and shop for essential goods have tilted the nation towards e-commerce.

Consumers have switched from shops, supermarkets, and shopping malls to online portals for the purchase of products, ranging from basic commodities to branded goods.

As people have embraced social distancing as a way to slow the spread of the pandemic, there has naturally been a drop-off in brick-and-mortar shopping. That would seem to mean there would likely be an increase in online shopping as people turn to ecommerce to purchase the items they might have otherwise purchased in person.



3. GOVERNMENT RECENT INITIATIVES:

While Indian e-commerce is growing at a stellar rate, initiatives such as Digital India, Skill India, Startup India and Make in India are also contributing to the growth of the online trade.

Several of Narendra Modi-led BJP government's initiatives are providing a fillip to the growth of the Indian e-commerce industry. While Indian e-commerce is growing at a stellar rate and is the fastest growing online business industry in the world, initiatives such as Digital India, Skill India, Startup India and Make in India are also contributing to the growth of the online trade, CARE Rating said in a report. The industry has witnessed an annual growth rate of 51%, which is the highest globally, and from \$24 billion in 2018, the industry is expected to touch \$200 billion by 2026; over eightfold growth in eight years, according to ASSOCHAM-Forrester study paper as well Retail Association of India (RAI). Indian e-commerce is also flourishing on the back of higher internet penetration, increasing quality of internet in the country, advancements in payments and computing on mobility platforms, changing consumer behaviour and shopping patterns and the availability of products priced at lower rates on e-commerce platforms. "E-commerce is probably creating the

biggest revolution in the retail industry, and this trend will continue in the years to come,” the CARE Ratings report said.

4. ACHIEVEMENTS

Top 6 Most Significant Achievement Factors in E-commerce Business

1. Platform and theme.
2. E-commerce plugins.
3. Search engine optimization.
4. Website content.
5. Check-out Process.

TOP 10 INDIA’S E COMMERCE COMPANY

- Amazon Development Centre India Pvt Ltd.
- Brainbees Solutions Pvt Ltd (Firstcry.com)
- Flipkart Internet Pvt Ltd (Walmart)
- Nykaa E-Retail Pvt Ltd.
- India MART Inter MESH Ltd.
- Snapdeal Pvt Ltd (Jasper Infotech)
- Just Dial Ltd.
- MakeMyTrip Ltd.
- Myntra Designs Pvt ltd.
- One 97 communications Ltd.

CHAPTER 4 : FLIPKART



Flipkart is an Indian grown E-commerce company which is also considered as Amazon of India. So it is no more good to pick out an Indian E-commerce company to have a detailed analysis on.

FLIPKART SUCCESS STORY

Flipkart is an Indian e-commerce company, headquartered in Bangalore, Karnataka, India, and incorporated in Singapore as a private limited company. The company initially focused on online book sales before expanding into other product categories such as consumer electronics, fashion, home essentials, groceries, and lifestyle products. In 2011, Flipkart is among India's dominant E-commerce platforms. It was started in October 2007 with its headquarters residing in Bengaluru.

Founded by **Sachin Bansal** and **Binny Bansal**, the online venture had initially begun as an online bookstore but as the firm's fame escalated, it grew and expanded its activities.

The platform started selling a variety of other products like music, mobile phones, as well as movies. With e-commerce gradually revolutionizing the world of retail and garnering its momentum in India, Flipkart expanded at a rapid pace steadily supplementing various new item categories in its collection.

Both being 2005 graduates from IIT Delhi, were officially exposed to the retail sector while working at Amazon. The two met at the workplace and explored their mutual interest in bringing about a change in the e-commerce industry of India.

This led to both quitting their jobs at Amazon in 2007, setting off to create a similar e-commerce company such as the one they worked for but focused specifically on the Indian user base. The two wished to offer Indians an online store that was created in India which led to the making of what we all now known as **Flipkart**. Presently, the company facilitates over 80 million+ products across the range of over 80 categories from mobile phones & accessories, computers, laptops, books and e-books, home appliances, electronic goods, clothes and accessories, sports and fitness, baby care, games, and toys, jewellery, footwear, and so on.

In the month of November 2020, as per Walmart, it registered a record number of monthly active customers. In order to ascertain prompt delivery to its user base, the firm presently contracts over 1 million square feet of

space in various areas which include Mumbai, Hyderabad, Bengaluru, Lucknow, Ahmedabad, etc.

FLIPKART BUSINESS MODEL

Comprising more than 150 million products in 80 categories, Flipkart stands as one of the dominant e-commerce companies in the nation.

The platform adopts social media platforms like Twitter, YouTube as well as Instagram for promoting their items. Being a **Business to Consumer model** firm, it offers its users the freedom to select their sellers and items from an extensive assortment of options.

One of the USP of this Platform is its Pricing.

FUNDING

The initial development budget was INR ₹400,000 (US\$5,600). It later raised funding from venture capital firms Accel India (receiving US\$1 million in funding in 2009) and Tiger Global (US\$10 million in 2010 and US\$20 million in June 2011). On 24 August 2012, Flipkart announced the completion of its 4th round of funding, netting a total of US\$150 million from MIH (part of the Naspers Group) and ICONIQ Capital. The company announced on 10 July 2013 that it had raised an additional US\$200 million from existing investors, including Tiger Global, Naspers, Accel Partners and Iconic Capital. By August 2015, after raising another US\$700 million, Flipkart had raised a total of \$3 billion over 12 rounds of funding from 16 major investors. In April 2017, Flipkart underwent another round of funding, receiving \$1.4 billion in funding from investors including eBay, Microsoft, and Tencent. On 10 August 2017, SoftBank Vision Fund invested another US\$2.5 billion in Flipkart.

On 19 September 2018, Flipkart Marketplace Singapore infused ₹3,463 crore into Flipkart Internet. The transaction was done in two tranches, according to regulatory filings.

REGIONAL MARKET

The company is also busy switching to selling movies, music, mobile phones and game beside books. Flipkart is also deepening its presence in book by selling by targeting the regional language book market , which has largely been untapped .More books are read in regional languages .It is tough to get a book supplier on a board. But once that is in place, this business will further explode says Sachin.

Things are easy said than done! To realise our dreams and also in a great manner is really a great task. The founder of Flipkart have amazingly conquered their dreams with success of Flipkart. Flipkart is something that really opened up the Indian e commerce market and that also in a big way.

Flipkart began with selling books since books are easy to procure and the target market which reads the books is in abundance, books provide more margin and are easy to pack and deliver, do not get damaged in transit and most importantly books are not very expensive.

So, the amount of money a customer has to spend to one's service for one time is very minimal. Flipkart sold books only for the first two years. Flipkart started with the consignment model i.e, they had tied with two distributors of Bangalore. Whenever a customer ordered a book they personally procure the books with the dealer pack the book in their office and then delivered the same. In the initial months the founder personal number used to be the customer's support service number .So in the start they tried their best ,focus on website -easy to browse and and order hassle free.

Since there were no any established players in the market this allowed them to grow and they did it in fact they grew very rapidly.

The company started with 2 employees and has around 4500 employees . Flipkart started with customers consignment as discussed above ,since most of the customers issues like delivery days etc. results from procurement model ,the company started opening its own warehouse as they need huge investments. The company opened its first warehouse in Bangalore and then later opened in cities like Kolkata ,Mumbai ,Chennai and Delhi.

COMPETITORS OF FLIPKART

Digitalisation of several entities has made it easy for consumers to shop online and make their purchasing easy. Flipkart is the largest E-commerce portal in India and carries out approximately 20 sales per minutes .Some of the top competitors of Flipkart in the industry include the following:

1. AMAZON



2. SNAPDEAL



3. ALIBABA



4. PAYTM



5. MYNTRA



6. JABONG



7. SHOPCLUES



WHAT MAKES FLIPKART A SUCCESS?

First Mover Advantage: Flipkart still enjoys the top-of-the-mind brand recall as far as buying books is concerned. Other portals such as Uread and Dial-a-Book are still struggling to register their brands into the consumer's mind. Over the years, Flipkart has diversified quickly; they now sell electronics to mobiles to home appliances.

Cash on Delivery: One area where Flipkart has scored strong is reading the virtual Indian consumer mind. Though the ecommerce user has matured, a large segment is still hesitant to make transactions using credit/debit card. The cash-on-delivery model has undoubtedly got them with going with the web conservatives.

Well-Marketed: It initially started with word of mouth and social media, and the Bansals have carried on the momentum well. Apart from investing in technical, operational and logistical capabilities, Flipkart, like any other strong brand, have invested a lion's share in advertising, thus giving the brand a significant visibility.

Easy to Buy: Again, Flipkart has understood the factors that dissuade an online user in India, by allowing them to buy products without registering. Alternatively, there's Facebook and Twitter sign-in. I can tell from my own experience that the delivery is superfast if the product is in stock.

E-commerce in the DNA: A critical factor in Flipkart's success, especially during the initial years, is that the founders are ex-Amazon employees, hence bringing in the required expertise and skillset needed to run and grow an ecommerce portal. Sure they possess great entrepreneurial skills too, which when blended with vertical knowledge, has spun great success for the 5 year old Flipkart.

FLIPKART'S OVERALL MARKETING STRATEGY

Flipkart is India's answer to Amazon. And just like Amazon, the company has rapidly become one of India's original unicorns. Founded by two friends, Sachin and Binny Bansal, as recently as 2007 in Bengaluru, the company is now owned by Walmart and is one of India's huge success stories. The winning Flipkart marketing strategy.

Let's talk about Flipkart's broad marketing strategy. On the face of it, their main principle seems to be focused on being present at every single touch point their customers are present at. Today this means using the majority of their budget on digital channels and marketing. Moreover, since India is a mobile-first country, this is most definitely paying off.

Flipkart also invests heavily in star power and influencer marketing. India loves Bollywood and Flipkart uses this to sell and raise awareness about their products. Ranbir Kapoor, Alia Bhatt, Amitabh Bachchan and Shraddha Kapoor have all been prominently featured in Flipkart TV ads and in their online campaigns. This shows that Flipkart not only has deep pockets, but also has an eye on the pulse of the market.

In recent years, Flipkart has increased its budget spend on digital marketing considerably. Earlier, they were spending crores in multichannel marketing campaigns that resulted in a large amount of cashburn. Since Kalyan Krishnamurthy took over Flipkart in 2017, there has been a large-scale revamp of its marketing strategy - it's become leaner and heavily based on digital, which has worked out well for them.

A study published in Livemint in 2017 outlines the very beginning of the transformation wherein potential customers showed a greater awareness of Flipkart's Big Billion Day sale as compared to other retailers.

WHERE FLIPKART MUST CATCH UP?

Having heaped praise on Flipkart, there are a few less-critical areas where Flipkart would need to tighten the noose as the ecommerce industry in India gains traction – like a better user interface, better logistical support for electronic goods, innovation (taking cue from Amazon-innovated Kindle), scalability, and most of all profitability.

FLIPKART FUTURE ROAD MAP

Flipkart said it plans to expand its grocery services to more than 70 cities in the next coming years the Walmart-owned company looks to cash in on the burgeoning e-grocery segment in the country.

Flipkart, which competes with US e-commerce major Amazon and billionaire Mukesh Ambani-led Reliance in the country's digital commerce space, has expanded its grocery services to more than 50 cities, including Kolkata, Ahmedabad and Vellore.

This expansion will provide users of seven large cities and more than 40 neighbouring cities access to high-quality grocery products, offers, quick deliveries and the most seamless grocery shopping experience.

The pandemic has led to millions of people turning to e-commerce for their grocery purchases that has driven the sharp growth in the e-grocery not only in metros but also from tier II cities and beyond.

E-grocery is projected to grow to touch USD 24 billion GMV (Gross Merchandise Value) by 2025 from about USD 3.3 billion in 2020, as per consulting firm Red Seer.

Players like Big Basket, Grofers and others too compete with giants like Flipkart, Amazon and Reliance in the e-grocery segment in the country.

Flipkart has also expanded its services to cities beyond the metros such as Mysore, Kanpur, Warangal, Allahabad, Aligarh, Jaipur, Chandigarh, Rajkot, Vadodara, Vellore, Tirupati and Daman, through a satellite-expansion marketplace model.

"Grocery continues to be one of the fastest-growing categories, with the increase in demand for quality food and household supplies from users. In line with this, we have invested in scaling up our grocery operations across the country, strengthening ecosystem partnerships," Flipkart Senior Vice President - Grocery, General Merchandise and Furniture

Flipkart Grocery has more than 7,000 products available across over 200 categories.

According to Flipkart, its grocery operations will also give a fillip to the local food processing industry, connecting farmers producers to lakhs of consumers through the tech enabled marketplace.

Recently, Flipkart Group CEO Kalyan Krishnamurthy said the company is working on scaling up its loyalty programme, grocery and fashion business as part of its efforts to strengthen its position in the burgeoning Indian e-commerce market.

CHAPTER 5 : RESEARCH DESIGN

The type of design that has been used for making this project is META - ANALYSIS DESIGN.

Meta-analysis is a **quantitative, formal, epidemiological study design used to systematically assess the results of previous research to derive conclusions about** that body of research.

The study is being conducted for online shopping in TOLLYGUNGE area of South Kolkata, West Bengal to find out the customer preferences in Choosing Flipkart. The purpose of this study is find out preferences of customer in choosing Flipkart based on customer's income, satisfaction levels.

DATA COLLECTION METHOD

- **PRIMARY DATA**

Primary data was collected through the survey method (questionnaire observation and interview) of the respondents. Observations regarding the rise of online shopping trends . The questionnaire aimed at studying the customers preferences and feedback for the online shopping sites Flipkart.

- **SECONDARY DATA**

Secondary data was collected through various data and articles available on the internet.

SAMPLING SIZE:

Sample size: For the research the sample size of: -

- 50 respondents were taken out of which 80% of the respondents are the frequent user of online shopping.
- The geographical area is limited within an area of Tollygunge, South Kolkata.

SAMPLING PROCEDURE:-

The tools used for analysing data are **rating methods ; pie charts graphs; line diagrams** etc.

Questionnaire is distributed to the individual respondents and special attention has been given to make him/her comfortable in answering the questions.

DATA ANALYSIS.

Data analysis is done by compilation and tabulation of the data. The following statistical tools are applied for analysing the data:-

- * Averages
- * Percentages
- * Indices
- * Ratio's
- * Growth trends
- * Simple Ranking.

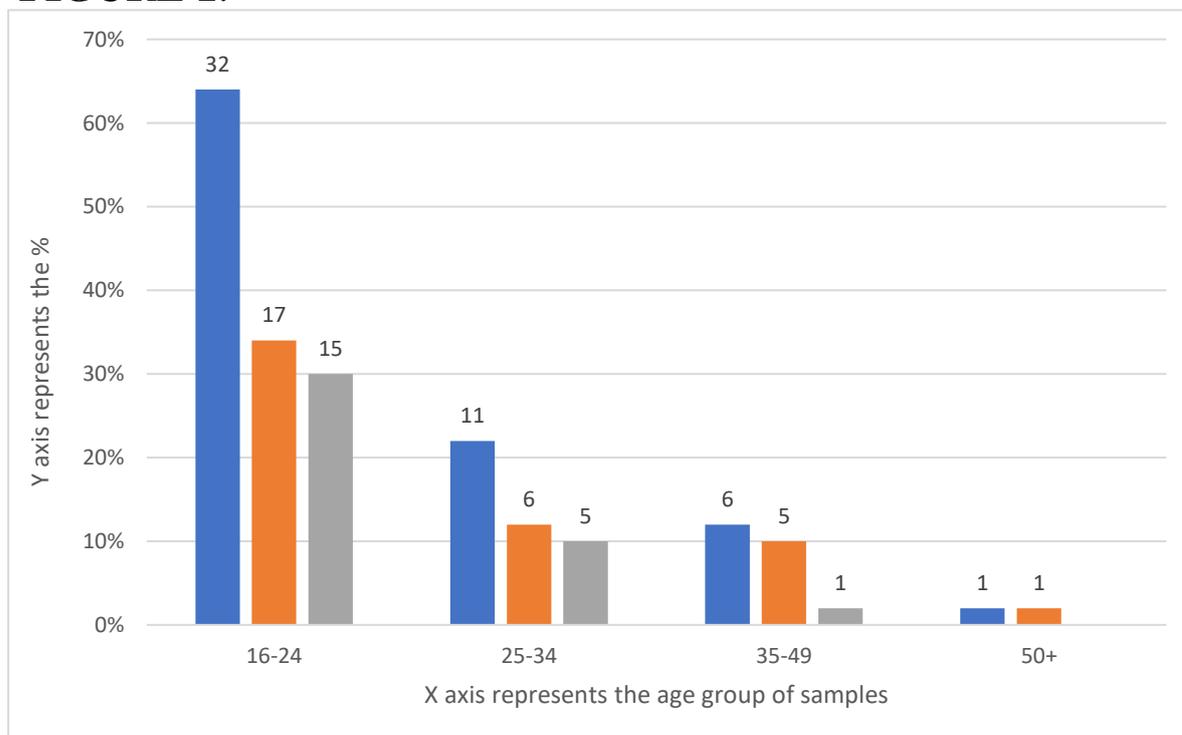
PRESENTATION OF DATA AND ANALYSIS

On the basis of answers received from questionnaire annexed the following analysis has been made :-

TABLE:1

AGE GROUP (in years)	total samples (in %)	Total samples (in no.)	male sample (in %)	Male samples (in no)	female sample (in %)	Female sample (in no)
16-24	64%	32	34%	17	30%	15
25-34	22%	11	12%	6	10%	5
35-49	12%	6	10%	5	2%	1
50+	2%	1	2%	1	-----	-----
TOTAL	100%	50		29		21

FIGURE 1:



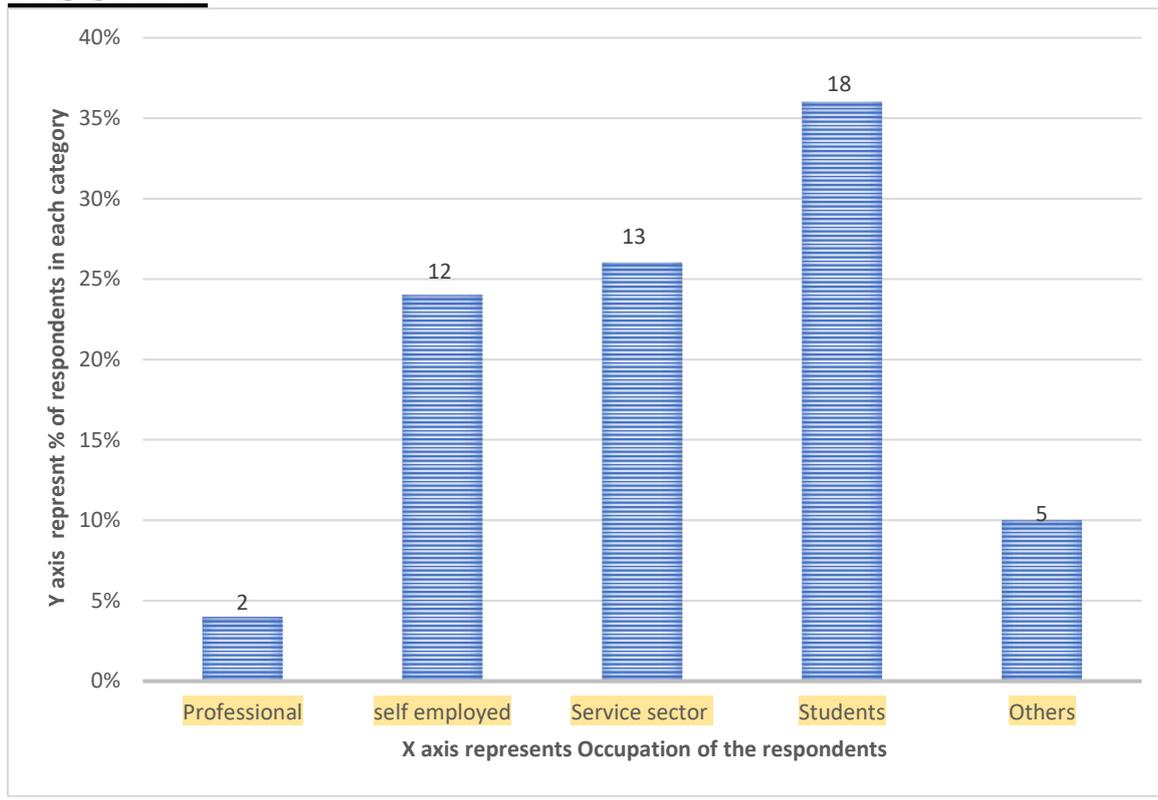
The above figure 1 ,shows the age group and Gender of the number of customers who were taken as samples for the sample study by analysing the same we could conclude the following:

- 64% of the samples belong to the age group of 16-24 years which contained 34% male samples and 30% female sample.
- 22% of the sample belong to the age group of 25-34 years which contain 12% male sample and 10% female samples.
- 12% of the samples belong to the age group of 35-49 years which contribute 10 % male samples and 2% female samples.
- 2% of the sample belong to the age group of 50+ year, which contain 2% male sample only.

TABLE 2

<u>OCCUPATION</u>	<u>% OF RESPONDENTS</u>	<u>NO OF RESPONDENTS</u>
Professional	4%	2
Self employed	24%	12
Service sector	26%	13
student	36%	18
Others	10%	5
TOTAL	100%	50

FIGURE 2



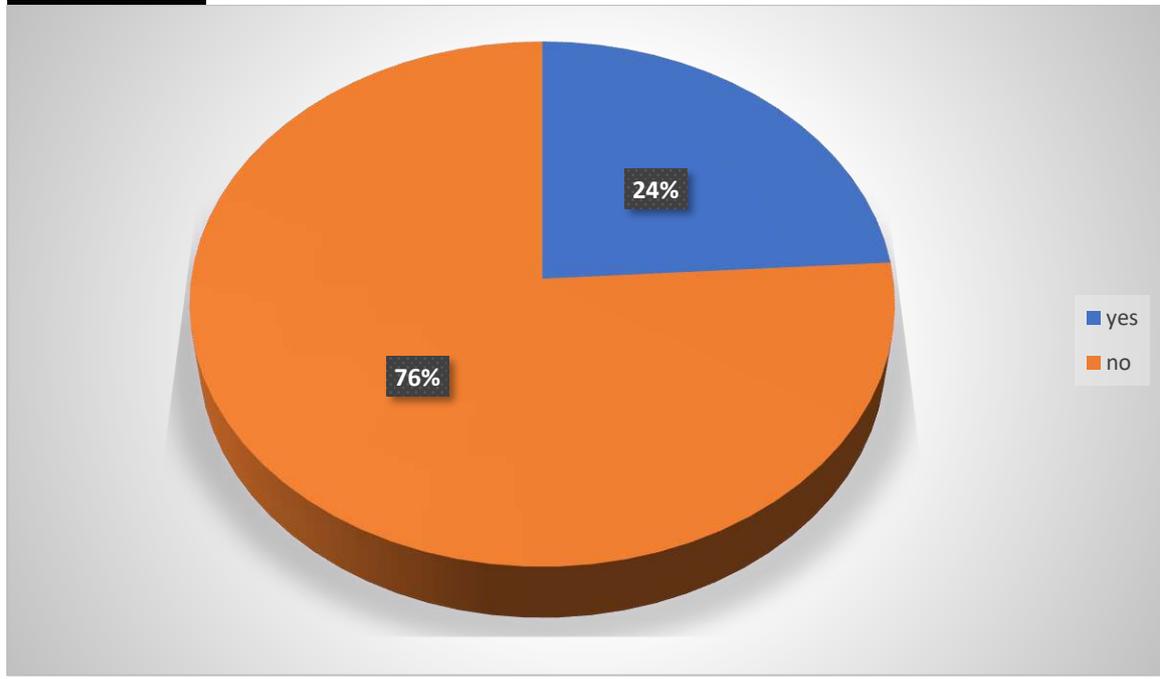
The above figure represents the Occupation of the customers who were taken as taken as samples for the sample study. By analysing the same we could conclude the following:

- 4% of the samples belongs were professionals.
- 24% of the samples were self employed.
- 20% of the samples were from service sector.
- 36% of the samples were students.
- 10% of the samples were others.

TABLE 3 : Does covid affect E-commerce market

Respondents	yes	No
50	12	38

FIGURE 3



From the figure 3, it can be analysed that :

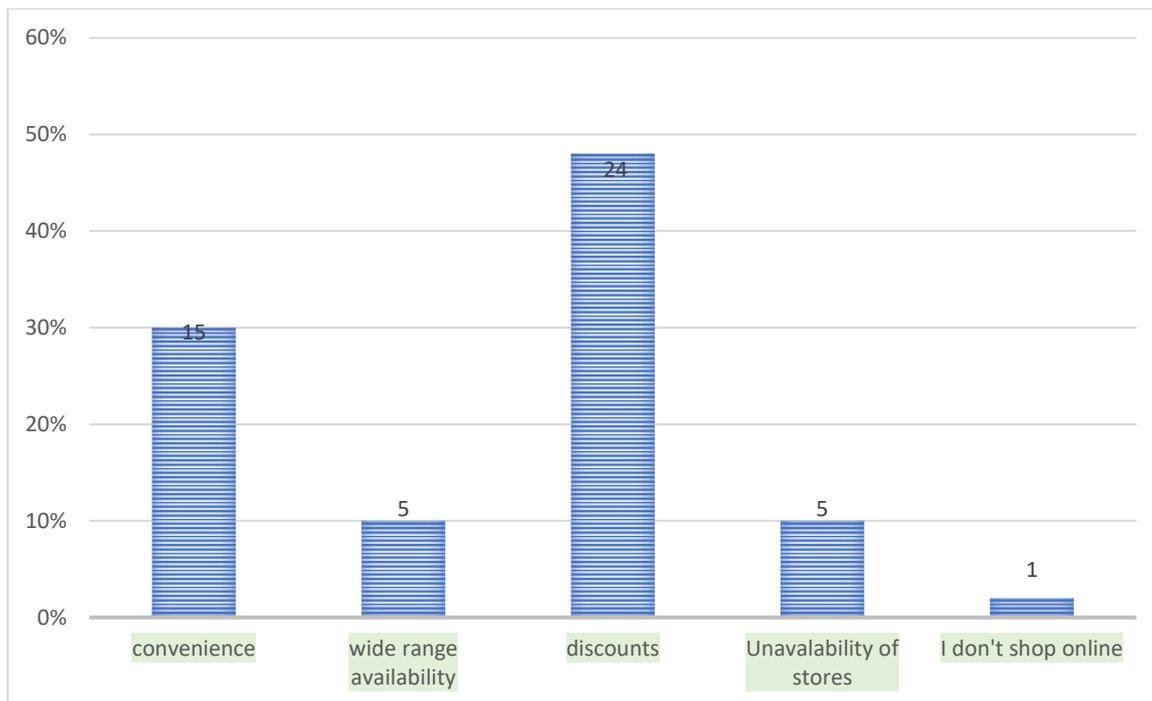
- 76% of the respondents thinks that Covid failed to affect the E commerce market.
- While rest 24% of the respondents feels that covid pandemic affect the E commerce market.

TABLE 4 :Reason for shopping online?

Reasons	No of respondents
Convenience	15
Wide range availability	5
Discounts	24
Unavailability of stores nearby	5

I do not shop online	1
TOTAL	50

FIGURE 4:



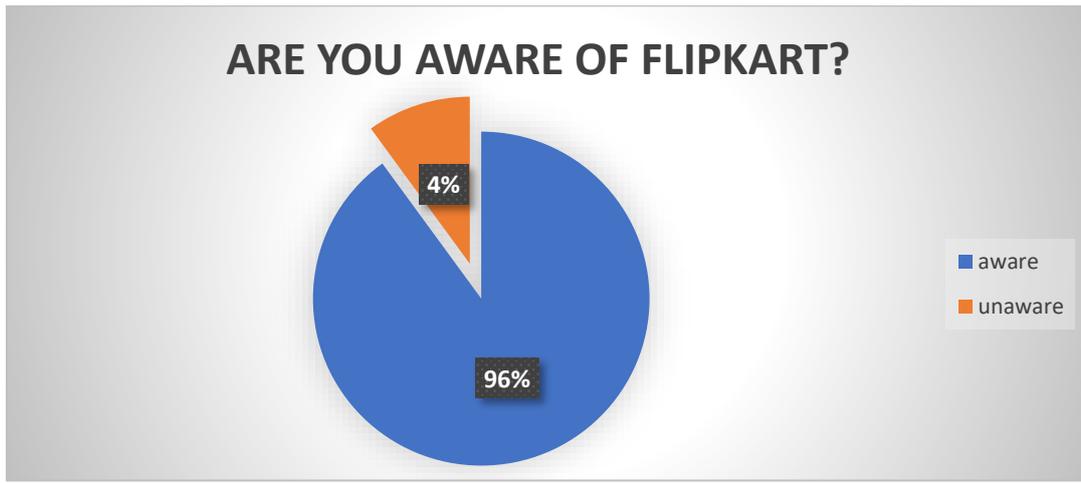
From the above figure we conclude that:

- 30% of total respondents choose online shopping mode because of convenience.
- 10% of total respondents choose online shopping due to availability of wide range facility being available.
- 48% of total respondents rely on online shopping because of highly discounts facility.
- 10% of total respondents shop online because of less no of availability of stores in this area.
- 2% of total respondents have never buy anything online.

TABLE 5:

<u>Response</u>	<u>% of Respondents</u>	<u>No of respondents</u>
Aware	96%	48
Unaware	4%	2
Total	100%	50

FIGURE 5



From figure 5 it can be concluded that :

- 96% of the respondents are aware of the Flipkart.
- 4% of the respondents are not aware of the Flipkart.

TABLE 6: How often you shop online?

	<u>Frequency in %</u>	<u>No of respondents</u>
More than once in a month	44%	22
Once in 1 - 2 months	34%	17
Once in 3-6 months	14%	7
Once in 7-12 months	6%	3
Never	2%	1
Total	100%	50

FIGURE 6



From figure 6 we summarize that:

- 44% of the respondents do online shopping more than once in a month.
- 34% of the samples collected do online shopping once in 1-2 months.
- 14% of the respondents do online shopping once in 7-12 months.
- 6% of the respondents buy online once in 7-12 months.
- 2% of the samples collected never buy online.

TABLE 7 : Which features you like in Flipkart?

<u>Features</u>	<u>Respondents in %</u>	<u>No of respondents</u>
Ease for searching the item you are looking for	10%	5
Discounts	48%	24
Customer services	12%	6
Cash on delivery	14%	7
Exchange offer	10%	5
Packaging	4%	2
I have never shopped at Flipkart	2%	1
TOTAL	100%	50

FIGURE 7



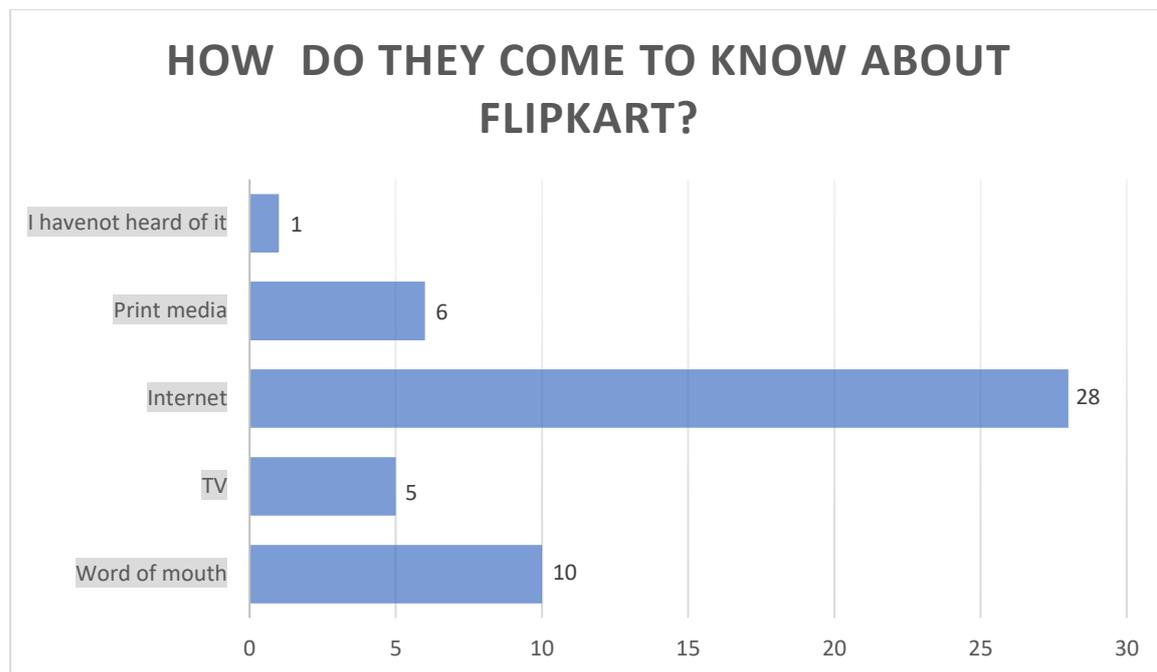
From the above figure we conclude that:

- 10% of the total respondents like Flipkart because of its Ease of searching products features.
- 48% of the total respondents like Flipkart because of its Discounts being offered to its customers.
- 12% of total samples likes Flipkart because of its extraordinarily good customer services.
- 14% of total respondents lure towards Flipkart because of its cash on delivery Features being given to its customers.
- 10% of the sample attracted towards Flipkart because of its Easy exchange offer facility.
- 4% of the customers like Flipkart because of its packaging.
- 2% of the total sample collected never shopped from Flipkart.

TABLE 8:How do they come to know about Flipkart ?

SOURCE	NO. of respondents
Word of Mouth	10
TV	5
Internet	28
Print Media	6
I have not heard of it.	1
TOTAL	50

FIGURE 8 :



From the above Figure We conclude that :-

Out of total 50 respondents:

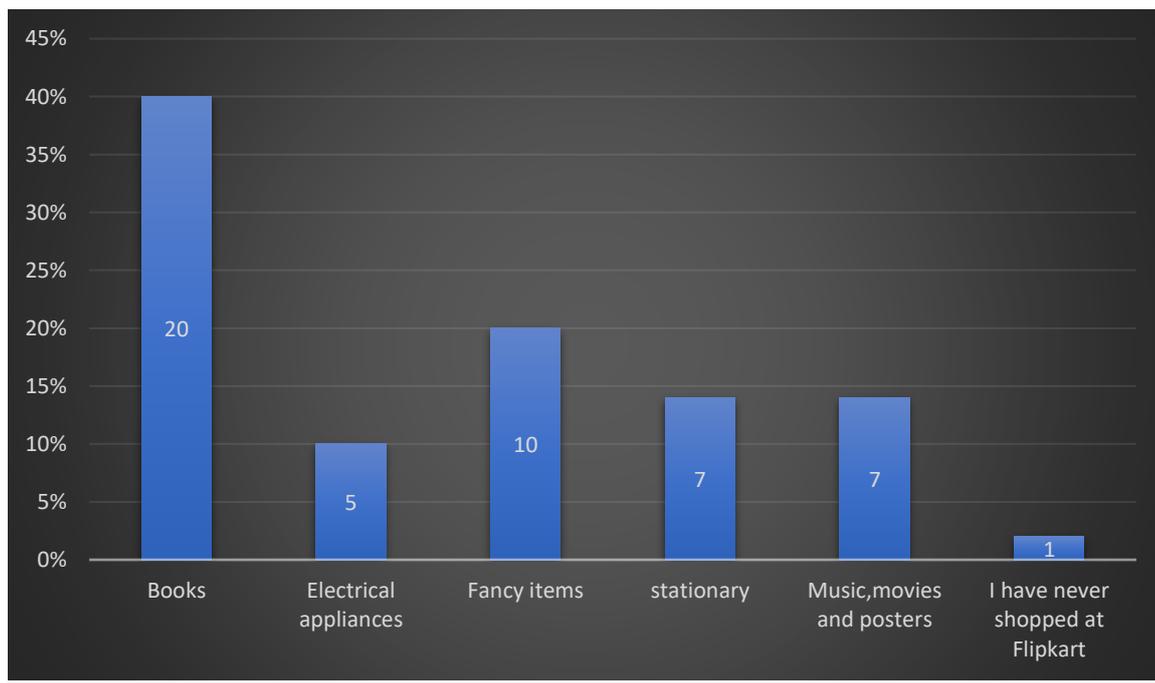
- 10 respondents get to know about Flipkart by Word of mouth.
- 5 of them know about Flipkart through TV.
- 28 which is the highest number of respondents get to know about Flipkart through Internet.
- 6 of them get to know about it through Print media.
- 1 respondent have no idea about Flipkart.

TABLE 9: What do they prefer buying from flipkart?

ITEMS	<u>RESPONDENTS(In %)</u>	<u>RESPONDENTS(in no)</u>
BOOKS	40%	20
ELECTRICAL APPLIANCES	10%	5
FANCY ITEMS	20%	10

STATIONARY	14%	7
MUSIC,MOVIES AND POSTERS	14%	7
I HAVE NEVER SHOPPED AT FLIPKART	2%	1
TOTAL	100%	50

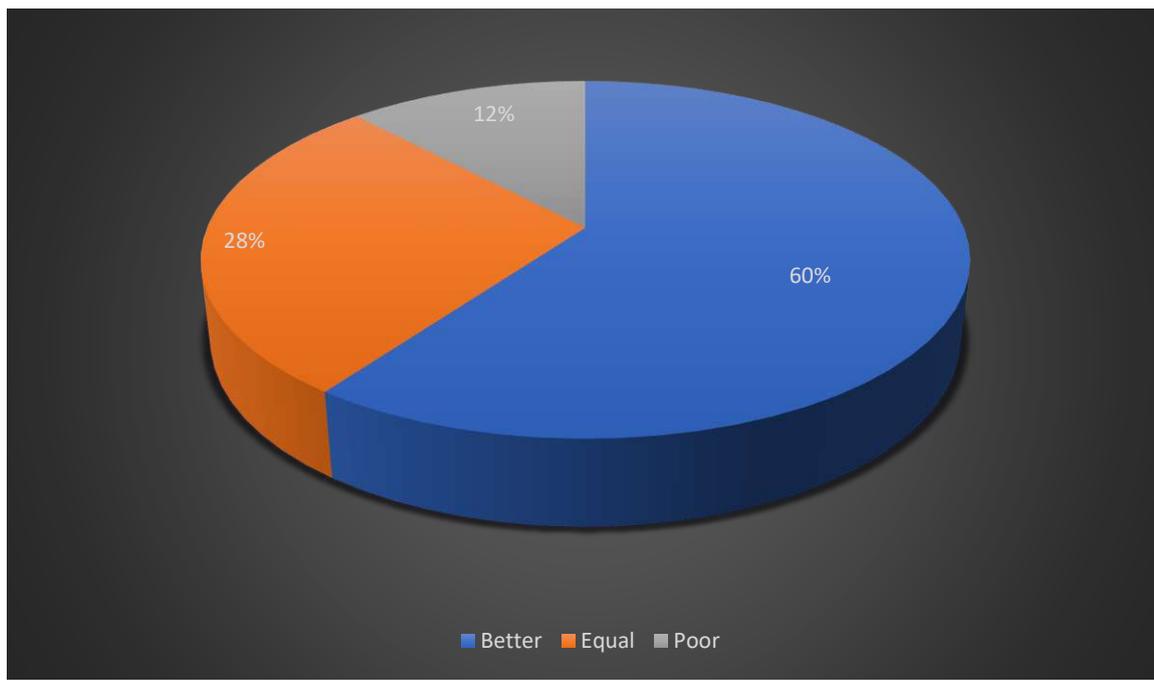
FIGURE 9:



The above figure shows that:

- 40% of total samples collected prefer Flipkart for buying books.
- 10% of total samples collected prefer Flipkart for buying electrical appliances.
- 20% of total samples collected prefer Flipkart for buying fancy items .
- 14% of total samples collected rely on Flipkart for buying stationary items.
- 14% of the total samples collected rely on Flipkart for buying music and posters
- 2% of total samples collected never shopped from Flipkart.

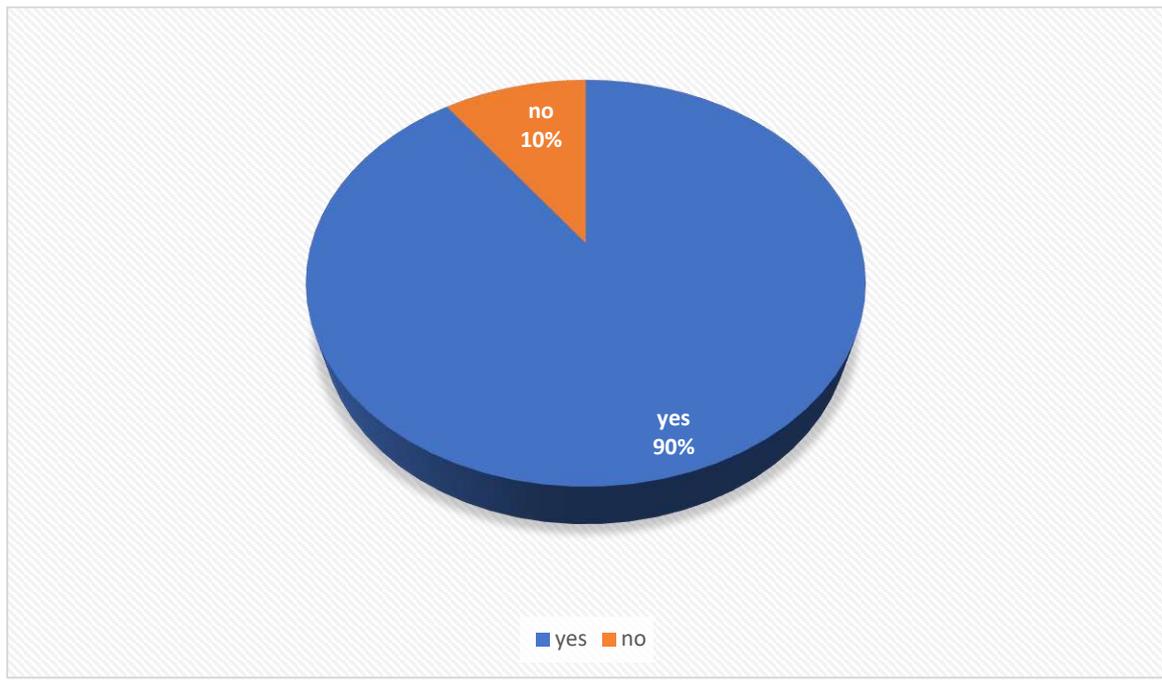
FIGURE 10: Overall experience with flipkart



From the above figure we conclude that:

- 60% of the respondents i.e,30 respondents have a better experience shopping with Flipkart.
- 28% of the respondents i.e, 14 respondents have equal experience shopping with Flipkart.
- 12% of the respondents i.e,6 respondents have poor experience shopping with Flipkart.

FIGURE 11: Will You recommend flipkart to others?



From the above figure we find that:

- 90% of the total respondents have said that they will recommend Flipkart to others.
- 10% of them will not recommend it to others.

FINDINGS :

1. As E commerce market enhances every single day there are also people who don't have basic knowledge about online shopping and how they actually work.
2. The last one and half year where the world including India were battling covid and facing severe depression phase in the economy E commerce sector is the only one which has evident a hike in their income and massive growth.
3. More than 48% of total respondents lure towards only online shopping because of the reason that they get high dicounts as compared to shopping through physical stores.
4. More than 44% of the total respondents shop for more than once in a single month.
5. Among all respondents,the student category sample has recorded the highest percentage whop shop through online.
6. More than 56% of the respondents come to know about Flipkart through Internet followed by Word of mouth.
7. 60% of the total Respondents have really a good experience shopping with Flipkart.
8. Around 90% of total respondents seems satisfied with the products being offered by Flipkart and they are ready to recommend it to their friends or other.

9. Majority of the respondents feel safe shopping online while the rest category belongs to those persons who are not really familiar with advancement and technology.
10. The respondents looks very happy and satisfied with the products and features being offered by the Flipkart.

CONCLUSIONS

Internet shopping has become an effective way of boosting Indian economy by increasing demand, expanding consumption and promoting employment. It has improved operations through enhanced use of electronic book keeping and records management. India's online shopping percentage are increasing every year. A recent ASSOCHAM report have said that over 120 million Indian consumer are expected to shop through online this year.

At last, it can be said that Flipkart foresaw that a growing customer base meant an increased demand for products and need for variety. Flipkart embarked on acquiring sellers in order to offer a broader product selection to customers. Flipkart went an extra miles to satisfy its customers by making its warehouse available to sellers for maintaining their inventories, thus enabling faster shipping. The company is currently valued at around 38 billion dollars which is around to 27000 crore in Indian rupees. This has led to generate a massive interest in e commerce sector and has also helped in creating a lot of job opportunities and growth of Indian economy as well.

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QUESTIONNAIRE:

1. **Name of the Respondent :**

2. **Age of the Respondent:**

16-24

25-34

35-49

50+

3. **Gender of the Respondent:**

Male

Female

4. **Occupation of the Respondent:**

Professional

Self Employed

Service Sector

Student

Others

5. **Does Covid affect Ecommerce Market?**

YES

NO

6. **What are the reasons for shopping Online?**

Convenience

Wide range availability

Discounts

Unavailability of Stores

I do not shop online

7. **Are you aware of Flipkart?**

YES

NO

8. How often do You shop online?

- More than once in a month
- Once in 1-2 months
- Once in 3-6 months
- Once in 7-12 months
- Never

9. Which features do you like in Flipkart?

- Ease of searching the item you are looking for
- Discounts
- Customer services
- Cash on delivery
- Exchange Offer
- Packaging
- I have never shopped at flipkart.

10. How do you come to know about flipkart?

- Word of mouth
- TV
- Internet Print media
- I haven't heard of it

11. What do you prefer buying from Flipkart?

- Books
- Electrical appliances
- Fancy Items
- Stationary
- Music, Movies and posters.
- I haven't shopped at Flipkart.

12.Overall experience with Flipkart.

Better

Equal

Poor

13.Will you recommend Flipkart to others?

YES

NO



Project Report

A study on Corporate Social Responsibility activities of Tata Group of Companies

(Submitted for the Degree of M.Com. in (Accounting & Finance) from Bhairab Ganguly College under the West Bengal State University)

Submitted by:

Name of the Student : Swarnayan Das
Registration No : 1071913401412
Roll : 103
Semester : 4th (M.Com)
Session : 2019-21

Submitted at:

Bhairab Ganguly College
Belghoria
(Under W.B.S.U.)

Supervised by:

Mr. Vijay Anand Sah
Asst. Professor
Department of Commerce

Supervisor's Certificate

This is to certify that Swarnayan Das a student of M.COM. 4th Semester in Accounting and Finance of Bhairab Ganguly College, Bheghoria, has completed a project titled a study on corporate social responsibility activities of Tata Group of Companies under my supervision and guidance. His project work is genuine and original to the best of my knowledge.

Place : Kolkata
Date : 07/09/2021

Prof. V.A.Sah
Department of Commerce

Student's Declaration

I hereby declare that the project work with the title a study on corporate social responsibility activities of Tata Group of Companies submitted by me for the partial fulfillment of the requirements of degree of M.Com. in Accounting & Finance at Bhairab Ganguly College under the West Bengal State University is my original work and has not been submitted earlier to any other University/Institution for the fulfillment of the requirements of any course of study.

I also declare that no chapter of this manuscript in whole or in part has been incorporated in this report from any earlier work done by me or others. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the reference.

Place : Kolkata

Date :07/09/2021

Name : Swarnayan Das

Registration No :1071913401412

Roll No :

Acknowledgement

I take this opportunity to pay my sincere thanks to all the people who have helped me directly or indirectly to complete my project successfully.

First of all I would like to express my sincere gratitude to Mr. Vijay Anand Sah, Asst. Professor in Commerce, Bhairab Ganguly College, Belgharia who in spite of his busy schedule provided his valuable guidance and sufficient material needed for the completion of the project.

I am also grateful to Prof. (Dr.) Subhranil Som, Principal, Bhairab Ganguly College, Belgharia for providing me the opportunity to work on the project.

Place : Kolkata

(Swarnayan Das)

Date :07/09/2021

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Chapter 1

Introduction

1.1 Background

The concept of social responsibility was traced back to the ancient times. The first stage of the CSR development happened thousand years BC where authorities introduced different rules and regulations where the workers were severely punished for being careless and injured someone during their work. "In Ancient Rome senators grumbled about the failure of businesses to contribute sufficient taxes to fund their military campaigns."(History of Corporate Social Responsibility and Sustainability) During the industrial revolution the concept grew to a whole new level and the significance of business in society started to increase exponentially. By the 1920s the new stage began that social responsibility was not seen as an ethic but became a whole new concept, however the magnitude of the concept was undervalued. As Dean of Harvard Business School Wallace B. Donham: "Business has not learned how to handle these changes, nor does it recognize the magnitude of its responsibilities for the future of civilization."(History of Corporate Social Responsibility and Sustainability)

The ideology of corporate social responsibility (CSR) has emerged as a response to pressure from the business side of growing leftist sentiment and the trade union movement in the last third of the XIX century. Incurred if the institutions of civil society demanded from businesses providing social guarantees to the workers and to ensure protection of their labor and the decline of trade unions in the mid XX century for business owners updated the task of preserving and maintaining the loyalty of motivation of subordinates, which again forced them to turn to CSR. It was then that the concept has become firmly established in the theory and practice of corporate governance in the U.S.

However the effect of globalization cannot be under estimated as it played a significant role in CSR, which forced companies to look for more creative ways of positioning information in a crowded world. Thus, CSR was the result of deep transformation of relations of private business and society in a post-industrial economy.

1.2 Research Problem

Currently the concept of Corporate Social Responsibility is a subject of debate and criticism. Defenders argue that it has a solid business case, and corporations receive many benefits because they work for a broader and more long-term than their own short-term gain momentary. Critics argue that social responsibility moves away from the fundamental economic role of businesses, and distracts the company from its main goal.

Thus, there are two main approaches to the study of corporate social responsibility. On one hand we have the notion of M. Friedman, who relies on formal rationality. On the other hand, we have representatives of the second approach, the liber idea of CSR. The researchers are relying on objective research. They recognize that the social responsibility of business is complex and cannot be reduced to the bare economic interest of profit maximization.

In analyzing both views this study will find out to what extend does Milton Friedman's traditional view of the CSR increase financial profits of the company.

Before we elaborate on these two opposite approaches to the study of corporate responsibility, it should be noted that the leaders and managers of today's companies are increasingly aware of the positive impact of socially responsible behavior to achieve not only strategic but also financial goals of the business.

1.3 Literature Review

The concept of CSR originated in the 1950's in the USA but it became prevalent in early 1970s. At that time US had lots of social problems like poverty, unemployment and pollution. Consequently a huge fall

in the prices of Dollar was witnessed. Corporate Social Responsibility became a matter of utmost importance for diverse groups demanding change in the business. During the 1980's to 2000, corporations recognized and started accepting a responsibility towards society. Corporate social responsibility (CSR) focuses on the wealth creation for the optimal benefit of all stakeholders – including shareholders, employees, customers, environment and society. The term stakeholder means all those on whom an organization's performance and activities have some impact either directly or indirectly. This term was used to describe corporate owners beyond shareholders as a result of a book titled Strategic management: a stakeholder approach by R. Edward Freeman in the year 1984.

1. According to Bowen (1953), CSR refers to the obligations of businessmen to pursue those policies to make those decisions or to follow those lines of relations which are desirable in terms of the objectives and values of our society.
2. Frederick (1960) has stated that social responsibility means that businessmen should oversee the operation of an economic system that fulfills the expectations of the people.
3. Davis (1960) has argued that social responsibility is a nebulous idea but should be seen in a managerial context. He asserted that some socially responsible business decisions can be justified by a long, complicated process of reasoning as having a good chance of bringing long-run economic gain to the firm, thus paying it back for its socially responsible outlook (p. 70).
4. Bajpai (2001) has mentioned that an ideal CSR has both ethical and philosophical dimensions, particularly in India where there exists a wide gap between sections of people in terms of income and standards as well as socio-economic status.
5. Goyder (2003) has argued that Industry in the 20th century can no longer be regarded as a private arrangement for enriching shareholders. It has become a joint enterprise in which workers, management, consumers, the locality, govt. and trade union officials all play a part. If the system which we know by the name private enterprise is to continue, some way must be found to embrace many interests whom we go to make up industry in a common purpose.)).
6. According to Wood (1991), CSR implies some sort of commitment, through corporate policies and action. This operational view of CSR is reflected in a firm's social performance, which can be assessed by how a firm manages its societal relationships, its social impact and the outcomes of its CSR policies and actions.

1.4 Objectives of the study

The main objectives of this project are-

- To understand the concept and nature of corporate social responsibility.
- To examine the corporate social responsibility practices at international level.
- To study the status of CSR practices in India.
- To explore the CSR activities of some of the companies.

1.5 Research Methodology

Research can be classified in many different ways on the basis of the methodology of research, the knowledge it creates, the user group, the research problem it investigates etc,

1.5.1 Basic Research

This research is conducted largely for the enhancement of knowledge, and is research which does not have immediate commercial potential. The research which is done for human welfare, animal welfare and plant kingdom welfare. It is called basic, pure, fundamental research. The main motivation here is to expand man's knowledge, not to create or invent something. According to

Travers, “Basic Research is designed to add to an organized body of scientific knowledge and does not necessarily produce results of immediate practical value.” Such a research is time and cost intensive.

1.5.2 Applied Research

Applied research is designed to solve practical problems of the modern world, rather than to acquire knowledge for knowledge's sake. The goal of applied research is to improve the human condition. It focuses on analysis and solving social and real life problems. This research is generally conducted on a large scale basis and is expensive. As such, it is often conducted with the support of some financing agency like the national government, public corporation, World Bank, UNICEF, UGC, Etc. According to Hunt, “applied research is an investigation for ways of using scientific knowledge to solve practical problems” for example:- improve agriculture crop production, treat or cure a specific disease, improve the energy efficiency of homes, offices, how can communication among workers in large companies be improved? Applied research can be further classified as problem oriented and problem solving research.

1.5.3 Problem oriented research

Research is done by industry apex body for sorting out problems faced by all the companies. E.g.:- WTO does problem oriented research for developing countries, in India agriculture and processed food export development authority (APEDA) conduct regular research for the benefit of agri-industry.

- As the name indicates, Problem identifying researches are undertaken to know the exact nature of problem that is required to be solved.
- Here, one clarification is needed when we use the term ‘Problem’, it is not a problem in true sense. It is usually a decision making dilemma or it is a need to tackle a particular business situation.
- It could be a difficulty or an opportunity.
- For e.g.:-Revenue of Mobile company has decreased by 25% in the last year. The cause of the problem can be any one of the following:
 - Poor quality of the product.
 - Lack of continuous availability.
 - Not so effective advertising campaign.
 - High price.
 - Poor caliber / lack of motivation in sales people/marketing team.
 - Tough competition from imported brands.
 - Depressed economic conditions
- In the same case, suppose the prime cause of problem is poor advertising campaign & secondary cause is higher pricing.
- To tackle the problem of poor advertising, we have to answer questions like, what can be the new advertising campaign, who can be the brand ambassador, which media, which channel, at what time & during which programmed advertisements will be broadcast.

1.5.4 Problem solving

This type of research is done by an individual company for the problem faced by it. Marketing research and market research are the applied research. For e.g.:- Videocon international conducts research to study customer satisfaction level, it will be problem solving research. In short, the main aim of problem solving research is to discover some solution for some pressing practical problem.

1.5.5 Quantitative Research

This research is based on numeric figures or numbers. Quantitative research aims to measure the quantity or amount and compares it with past records and tries to project for future period. In social sciences, “quantitative research refers to the systematic empirical investigation of quantitative properties and phenomena and their relationships”. The objective of quantitative research is to develop and employ mathematical models, theories or hypothesis pertaining to phenomena.

The process of measurement is central to quantitative research because it provides fundamental connection between empirical observation and mathematical expression of quantitative relationships. Statistics is the most widely used branch of mathematics in quantitative research. Statistical methods are used extensively with in fields such as economics and commerce.

1.5.6 Qualitative Research

Qualitative research presents non-quantitative type of analysis. Qualitative research is collecting, and interpreting data by observing what people do and say. Qualitative research refers to the meanings, definitions, characteristics, symbols, metaphors, and description of things. Qualitative research is much more subjective and uses very different methods of collecting information, mainly individual, in-depth interviews and focus groups.

The nature of this type of research is exploratory and open ended. Small number of people is interviewed in depth and or a relatively small number of focus groups are conducted. Qualitative research can be further classified in the following type.

I. Phenomenology:-a form of research in which the researcher attempts to understand how one or more individuals experience a phenomenon.

E.g.: -we might interview 20 victims of Bhopal tragedy.

II. Ethnography: - this type of research focuses on describing the culture of a group of people. A culture is the shared attributes, values, norms, practices, language, and material things of a group of people.

E.g.: -the researcher might decide to go and live with the tribal in Andaman island and study the culture and the educational practices.

III. Case study:-is a form of qualitative research that is focused on providing a detailed account of one or more cases.

E.g.: -we may study a classroom that was given a new curriculum for technology use.

IV. Grounded theory: - it is an inductive type of research, based or grounded in the observations of data from which it was developed; it uses a variety of data sources, including quantitative data, review of records, interviews, observation and surveys

V. Historical research:-it allows one to discuss past and present events in the context of the present condition, and allows one to reflect and provide possible answers to current issues and problems.

E.g.: -the lending pattern of business in the 19th century.

In addition to the above, we also have the descriptive research. Fundamental research, of which this is based on establishing various theories. Also the research, is classified in to

1. Descriptive research-Descriptive research can be explained as a statement of affairs as they are at present with the researcher having no control over variable. Moreover, “descriptive research may be characterized as simply the attempt to determine, describe or identify what is, while analytical research attempts to establish why it is that way or how it came to be”.

Descriptive research is “aimed at casting light on current issues or problems through a process of data collection that enables them to describe the situation more completely than was possible without employing this method”.

In its essence, descriptive studies are used to describe various aspects of the phenomenon. In its popular format, descriptive research is used to describe characteristics and/or behavior of sample population.

An important distinctive trait of descriptive research compared to alternative types of studies relates to the fact that while descriptive research can employ a number of variables, only one variable is required to conduct a descriptive study. Three main purposes of descriptive studies can be explained as describing, explaining and validating research findings.

Descriptive studies are closely associated with observational studies, but they are not limited with observation data collection method, and case studies, as well as, surveys can also be specified as popular data collection methods used with descriptive studies.

2. Exploratory research- Exploratory research, as the name states, intends merely to explore the research questions and does not intend to offer final and conclusive solutions to existing problems. Conducted in order to determine the nature of the problem, this type of research is not intended to provide conclusive evidence, but helps us to have a better understanding of the problem. When conducting exploratory research, the researcher ought to be willing to change his/her direction as a result of revelation of new data and new insights.

Exploratory research design does not aim to provide the final and conclusive answers to the research questions, but merely explores the research topic with varying levels of depth. It has been noted that “exploratory research is the initial research, which forms the basis of more conclusive research. It can even help in determining the research design, sampling methodology and data collection method” Exploratory research “tends to tackle new problems on which little or no previous research has been done”. Unstructured interviews are the most popular primary data collection method with this type of research.

Looking into the objectives of the study the research design employed for the study is descriptive research design. This research design is adopted to have greater accuracy and in depth analysis of the research study. Secondary data have been comprehensively used for the study.

1.5.7 Types of Data: Primary and Secondary data

There are many ways of classifying data.

A common classification is **based upon who collected the data.**

Primary data: Data collected by the investigator himself/ herself for a specific purpose.

Examples: Data collected by a student for his/her thesis or research project.

(In movies) The hero is directly told by the heroine that he is her “ideal man”.

Some Advantages of using Primary data:

- The investigator collects data specific to the problem under study.
- There is no doubt about the quality of the data collected (for the investigator).
- If required, it may be possible to obtain additional data during the study period.

Some Disadvantages of using Primary data (for reluctant/ uninterested investigators):

- The investigator has to contend with all the hassles of data collection.
- deciding why, what, how, when to collect
- getting the data collected (personally or through others)
- getting funding and dealing with funding agencies
- Ethical considerations (consent, permissions, etc.)
- Ensuring the data collected is of a high standard-
- all desired data is obtained accurately, and in the format it is required in
- there is no fake/ cooked up data
- unnecessary/ useless data has not been included
- Cost of obtaining the data is often the major expense in studies

Secondary data: Data collected by someone else for some other purpose (but being utilized by the investigator for another purpose).

Examples: Census data being used to analyze the impact of education on career choice and earning.

(In movies) The hero reads a fictional account of the heroine’s “ideal man” (written for a course in English composition) that seems to describe him accurately. He seeks confirmation from his friends, concluding that *he* is her “ideal man”. (He never asks her directly, but assumes the “facts” are correct).

Some Advantages of using Secondary data:

1. The data’s already there- no hassles of data collection
2. It is less expensive
3. The investigator is not personally responsible for the quality of data (“I didn’t do it”)

Some disadvantages of using Secondary data:

1. The investigator cannot decide what is collected (if specific data about something is required, for instance).
2. One can only hope that the data is of good quality
3. Obtaining additional data (or even clarification) about something is not possible (most often)

Exhaustive literature survey regarding the topic and related concepts has been done. Secondary data inclusive of quantitative and qualitative data as well collected from various sources including books, research papers, newspapers, articles, magazines, and websites is used for the purpose of study.

1.6 Limitations of the study

Following are the chief limitations of the project:

- The study runs through time constrains.
- Since the project is entirely based on the secondary data, obtaining additional data or even clarification about something is most often not possible.
- As it is the beginner's step so the project is based on very limited knowledge.
- One can only hope that the data is of good quality.

1.7 Scheme of work

This study consists of the following chapters:

Chapter I – INTRODUCTION: - This chapter comprises of background of the study, research problem, literature review, objectives of the study, research methodology, limitations of the study, and further scope of the study.

Chapter II –CONCEPTUAL FRAMEWORK:-This chapter explains the meaning of Corporate Social Responsibility, types, importance, advantages, and disadvantages

Chapter III –INTERNATIONAL AND NATIONAL SCENARIO

Chapter IV- TATA GROUP AND CSR

Chapter V – DATA ANALYSIS AND INTERPRETATION

Chapter VI – SUMMARY OF FINDINGS:-This chapter covers the findings, conclusion recommendation portion of the project.

1.8 Scope for Further Research

1. A comparative study of Corporate Social Responsibility practices of different countries across the globe could be undertaken.
2. Corporate Social Responsibility is a relatively dynamic area of research in modern management; hence there is vast scope for validation and standardization of tools relating to Corporate Social Responsibility Practices of various companies.
3. Further study may focus on identifying and comparing the perception of line managers, staff managers and employees on Corporate Social Responsibility practices of the company.
4. Based on earlier research conducted relating to CSR, companies can be advised to device their policies about CSR regularly

Chapter 2

Conceptual Framework

2.1 Meaning

Corporate social responsibility, or CSR, is a corporation's obligation to its stakeholders, which are any groups/people that have a stake or interest in a company's success and products. This includes customers, employees, suppliers, investors and the communities surrounding the business. Stakeholders have varying needs to be met. Whereas a customer's greatest concern may be the safety of a company's products, an employee's need might be for a fair wage and safe working conditions. An investor may be concerned with profits and the bottom line, while the community may care about a business limiting the pollution it causes. Thus, corporate social responsibility means maximizing the good and minimizing the bad effects your company has on these stakeholders' diverse interests.

2.2 Types of Corporate Social Responsibility

There are four types of CSR according to its beneficiaries:

2.2.1 Environment-Focused Corporate Social Responsibility (CSR)

This type of CSR focuses on reducing detrimental effects of the corporation's operations on the environment. The corporation innovates in its manufacturing stage to reduce the production of environment harming by-products. It also promotes the use of non-renewable energy sources to prevent harm caused to the environment by burning of fossil fuels.

2.2.2 Community-Based Corporate Social Responsibility (CSR)

The corporation joins hands with other organizations (usually Non-Profit ones) to ensure the welfare of a local community's people. These organizations either fund or receive funding from corporations to perform tasks that can improve the living conditions of the community's people.

2.2.3 Human Resource (HR)-Based Corporate Social Responsibility (CSR)

Corporations focus on the well-being of their own staff and improve their living conditions. The companies may extend compassionate leaves like paternity leaves so that the employee can look after his newborn. They can also provide medical insurance to their employees to take care of accidents caused due to occupational hazards.

2.2.4 Charity Based Corporate Social Responsibility (CSR)

In a charity-based CSR, corporations donate to organizations or individuals (usually through a charity partner) to improve their financial condition and for their general upliftment. This is the most common form of a CSR activity. Most corporations provide direct financial support to organizations or individuals who require such assistance.

2.3 Importance of Corporate Social Responsibility

Corporate Social Responsibility is a self-regulatory form of corporate conscience included into business models whereby it is guaranteed that the business is keenly accommodating with the force of law and ethical standards according to national and international norms. The term has been in use since the 1960s and maintained its usage extensively to shield legal and moral responsibility. Ever since its inception this sustainability strategy has been opted by companies to reflect their competitiveness. Their overall aim is to impact the society positively while get the most out of the

creation of shared value for the shareholders, stakeholders and even employees. However CSR has two threads – the first type holding the common definition of CSR by the public in general. For example, companies providing funding for valuable social causes. The second type is more headed for laying down a real plan like employment creation and economic development through environmental initiatives, manufacturing products, using safe materials, etc. To cite a bright example of this, we may bring in light the “cola wars” between Coke and Pepsi, one of the oldest rivalries in business. Both have a vigorous approach towards market share yet their CSR strategies are slightly different, if not all similar, like introduction of sustainable packaging as well as policy of zero net water usage.

Despite CSR’s capacity of fetching a lot to the corporate desk, a fair number of companies show high dissatisfaction towards this responsibility with some disclosing to have adopted CSR in the first place as marketing tactic and some, considering CSR as a coerced burden whose absence may have brought much more to the companies in the long run. Hence, to understand what importance CSR holds in today’s era and whether its graft is worth the outcome or not, we must look at some of the following points.

2.3.1 Advanced Public Image

Companies which are perceived as less self-regarding are actually favored by customers. It may be psychological but somehow people find companies with social responsibilities as more approachable. Sending out messages about your corporation’s philanthropic attitude will do good to design the public image as it reflects an empathetic side of the company. Corporations can do that by supporting nonprofit organizations or through donations.

2.3.2 Boosts Government Relations

To be in the good books of politicians and government regulators, companies must present a positive public perception on its seriousness about social responsibility. This is not only the best way to make easier contacts with government officials but also to avoid various investigations and probes or even public campaigns.

2.3.3 Customer & Employee Engagement

It becomes easier to talk to customers or pursue them when you have a rather good message to share. When customers get interested eventually in your cause, they’re slowly going to believe the ambitions of your company. Obviously this is no maneuvering but with a little effort on social responsibilities, a company reaches more public in new ways than it might do without CSR. Likewise, today’s generation is ambitious and they’re in the constant lookout for being associated with companies that have a good public image and is always in the media for its positive decisions.

2.3.4 Brand Distinction

This is one of the reasons why companies from past incorporated CSR in the first place. But since it is a common phenomenon now, corporations are trying out new ways to build up their goodwill by experimenting on their social responsibilities. They’re not only taking it seriously but bringing in a lot of creativity so that they serve their visionary purpose along with creating a distinct image for themselves in the market.

2.3.5 Positive Workplace Environment

Corporations that care about the lives outside the barriers of their business kind of inspire and motivate employees to walk into work each day eagerly. This enhances the relationship between the highest management to the lowest paid workers as they go on to believe that a united approach could do wonders.

Along with these there are other advantages of establishing CSR like retaining investors who want to constantly know that their funds are being used properly, creating strong partnership between nonprofit organizations and companies and dig out the best of their workforce. With so many benefits and a vision to be a company that people look upon must be the ultimate goal of every corporation after all.

2.4 Advantages Corporate Social Responsibility

2.4.1 Improvement in the image of the Corporation

The most obvious advantage that a corporation can obtain by implementing CSR policies is that of an increased goodwill value. This serves a dual purpose – Firstly, people will want to buy the product that the corporation is selling because of its good and clean image. Secondly, other enterprises will want to do business and be associated with the corporation. This increases the corporation's prestige to such a high level that its name may become synonymous with reliability and goodness.

People always want to be associated with the best and the most popular, so in that respect, the corporation rises in stature and becomes an important player in its market.

2.4.2 Increased Attraction and Retention of Employees

Companies having solid CSR commitments find it easier to recruit and retain employees. People want to work for companies that care about the well-being of their employees and provide good working conditions. Compassionate attitude towards employees is highly desired by both new recruits and old employees alike. Appraisals, financial assistance in times of need, and attention given to personal achievements and special days (like birthdays) make employees want to remain with the company.

This is a huge advantage when there is a tight labor market situation. This will reduce the cost of training new recruits and free up incentives for existing employees. Incentives induce efficient work out from employees. In short, if the company's workforce is happy, the company gets more profits due to increased efficiency in production.

2.4.3 Regulatory Authorities become less hostile

A corporation with strong CSR programs will not be scrutinized by regulatory authorities as much as companies without CSR programs. The authorities will be lenient in their regulation because they feel that the company must be complying with all regulations as it is supported by firms and people alike for its welfare work. A company with strong CSR programs will always work within regulations to get benefits (other than profits) from these CSR programs.

The authorities will give fast-track preference to this company. It may also forego cumbersome paperwork that is required to set up projects if it thinks that this project is going to help the community to improve.

2.4.4 Attracts more Capital Inflow from Various Sources

A company's image plays a huge role in attracting investors. If the company is engaged in CSR programs, its image gets a massive boost, and so, people invest in its operations heavily. This company will attract capital even from abroad in the form of FII, thus, helping the country to get

valuable foreign exchange. It will also attract investment from other firms and industries, and it will become a name that can be trusted easily.

Even the Government of the country may be willing to invest in the company, leading to lesser regulation and red-tapism.

2.4.5 Generation of Clean and Renewable Energy from Environmental CSR

If the company has invested in an environmental CSR program, it will make sure that its operations do not harm the environment in any way. Inventing machines and techniques to reduce the harmful effects of its operational activities will give the community a clean environment. It will also give the company a chance to explore the usage of renewable energy for its operations.

This will reduce the cost of acquiring fossil fuels and can reduce the cost of production by a one-time investment in renewable energy production.

2.4.6 Positive Publicity

A popular business principle is that any publicity is good publicity. You should be known to the people to sell your product. A good CSR program will always give good publicity and even act as an advertisement for the company.

It also sets the company apart from its competitors. They may be selling a similar product at lower rates, but you are keeping the interests of your environment and community intact, and so the people do not mind a little extra charge for this thoughtfulness.

2.5 Disadvantages of Corporate Social Responsibility

2.5.1 Shift from the Profit-Making Objective

Milton Friedman, an economist, is the biggest critic of CSR. He says that CSR shifts the focus of the company from the objective that made it a financial entity in the first place – profit-making. The company forgets about its obligations towards its shareholders that they have to make profits for them. Instead of focusing on making profits, they engage in CSR programs and use up funds for community welfare.

So basically, instead of an income, the company is affecting an outflow of cash and not fulfilling its profit-making obligations.

2.5.2 Company Reputation takes a hit

According to CSR policies, companies have to disclose shortcomings of even their own products if they are found to violate the CSR program. For example, car manufacturing companies calling back their vehicles in large numbers when they find glitches in the model after having sold them wallops their reputation.

This creates inconvenience to the customers, and they lose trust in the manufacturer.

2.5.3 Customer Conviction

Initially, customers like to see the companies that they trust are engaged in social welfare programs. They like the fact that these programs are for a good cause. Later, they grow wary of it. If they don't see instant results from these programs, they think that these are nothing but PR stunts. So it

becomes difficult to convince customers that the results will take some time in coming and that they should continue believing in the good intentions of the company.

These attempts of convincing become fruitless day by day because some customers are impatient and have a constant desire to be appeased.

2.5.4 Increase in Cost of Production

More often than not, CSR programs increase the expenditure of the company. This increased expenditure is reflected in the increased prices of the product for which, ultimately, the customers have to pay.

Large corporations can absorb this increased expenditure. They may not increase their products' prices, but small businesses have no other option but to increase their products' prices to meet their increased expenses.

2.6 The Pyramid of Corporate Social Responsibility

One way to view corporate social responsibility is through Carroll's pyramid, which he claims present the concept such that social responsibility will be accepted by a conscientious business person. There are four kinds of social responsibility—economic, legal, ethical, and philanthropic—which can be depicted in a pyramid, as presented in the following picture. Carroll contends that all of these responsibilities have always existed to some degree, but ethical and Philanthropic responsibilities have become significant only in recent years.

Economic responsibilities relate to business's provision of goods and services in society. Profits result from this activity and are necessary for any other responsibilities to be carried Out. It is assumed that corporations will be as profitable as possible, maintain a strong competitive position, and maintain a high level of operating efficiency.

Legal responsibility relates to society expects business to conform to laws and regulations formulated by governments that act as the ground rules under which business must operate. Corporations are expected to pursue profits within the framework of the law, this establishes what are considered fair operations. Society expects that all goods and services and relationships with stakeholders will meet at least minimal legal requirements.

Ethical responsibilities include those activities that are not expected or prohibited by



Source: This article was published in *Business Horizons* journal, July/August 1991 by Archie Carroll, "The Pyramid of Corporate Social Responsibility," 42. Copyright Elsevier & Kelley School of Business, Indiana University.

society as economic or legal responsibilities. Standards, norms, or expectations that reflect concern for select stakeholder input is fair, just, or in keeping with their moral rights. Ethics or values may be reflected in laws or regulations, but ethical responsibilities are seen as embracing the emerging values and norms that society expects of business even if not currently required by law. These responsibilities are more difficult for business to deal with as they are often ill defined or under continual public debate. Ethical responsibilities also involve the fundamental ethical principles of moral philosophy, such as justice, human rights, and Utilitarianism. The changing or emerging ethical responsibilities are constantly pushing legal Responsibilities to broaden or expand, while at the same time expecting business's ethical behavior to go beyond mere compliance with laws and regulations.

Philanthropic responsibilities involve being a good corporate citizen and include active participation in acts or programs to promote human welfare or goodwill. Examples are contributions to the arts, charities, and education. Such responsibilities are not expected in an ethical or moral sense, making philanthropy more discretionary or voluntary on the part of business even though society may have such expectations of business. Carroll views the pyramid as a basic building-block structure, with economic performance

as the foundation. At the same time, business is expected to obey the law, behave ethically, and be a good corporate citizen. Although the responsibilities are portrayed as separate elements, in practice they are not mutually exclusive; however, the separation aids managers to appreciate the different obligations that are in a constant but dynamic tension with one another. For example, there are particular tensions between economic and ethical responsibilities. In summary, Carroll views the total social responsibility of business as involving the simultaneous fulfillment of the four responsibilities—which, stated in pragmatic terms, means that the corporation Should strive to make a profit, obey the law, be ethical, and be a good corporate citizen.¹² Carroll's pyramid represents one of the earliest attempts to integrate the economic and Social responsibilities of the corporation. Evidence is accumulating that supports consideration Of economic (tangible) and social (intangible) responsibilities:

- Economic (profits) and social responsibilities (ethics) are not mutually exclusive.
- Research shows that economic and social responsibilities are often inseparable.
- Corporations that consider social responsibilities seriously tend to outperform solely Profit-seeking corporations.

There is resistance to this convergence of economic and social responsibilities. Managers Who incorporate social responsibilities into decision making are sometimes labeled as “do-gooders” Who are ignoring profits? There are segments of society that suggest there is nothing Good about business and that it cannot be ethical or concerned about social issues. It is argued That business should stay out of social responsibilities, as it is often difficult to judge what is right or wrong and managers are not prepared to make such decisions. An outcome of this shift toward integrating economic, social, and environmental responsibilities has been the emergence of new concepts.

Chapter 3

International and National Scenario

Global scenario

The world corporate social responsibility is ever growing and changing. Some of the prominent developments, trends and initiatives from around the world in recent past with respect to CSR are enlisted below.

With increasing competition and globalization there is an increased level of pressure for transparency and disclosure. According to CorporateRegister.com more than 5500 companies issues sustainability report around the world in 2011. This figure was around 800 a decade ago the big accounting firms are extending their contribution to audit all these disclosures and are also sponsors for fourth edition of the Global reporting Initiative Guidelines (these are guidelines that outline standard CSR disclosure). In 2012 a new initiative, the Global Initiative for Sustainability Rating, was undertaken to standardize the rating framework.

CSR is now being viewed as differently by companies who plan to both collaborate and compete on CSR issue. The “Pulse Survey” conducted by Reputation Institute in 2011 indicates that CSR contributes more than 40% to company’s reputation and thereby multi stakeholder networks that promotes CSR collaboration. The collaboration is mainly on issues which are so massive that collaboration makes it more efficient to work on them.

The increasing drift towards globalization has stretched the scope of CSR. For example, the addition of clause for conflict minerals in Dodd-Frank Financial Reform Act has opened new arena for corporate responsibility by making many businesses to track four minerals back to their sources so as to make sure that they don’t add to conflict in minefields of Central Africa. The example points out to the trend that corporate world is accountable for responsible behavior in all aspects of supply chain.

There is a strong positive correlation between CSR and employment engagement. ‘The Society of Human Resources Management’ conducted a research by comparing companies with strong sustainability initiatives with those having weaker programs and the results shows that in companies with stronger sustainability programs morale was 55% better, business processes were 43% more efficient, employee loyalty was 38% better and image of company was 43% stronger.

United Nations recently (September, 2013), through its Global Compact, signed a deal with Pearl Initiative (United Arab Emirates based private sector organization that works towards improving transparency, accountability and business practices in the Arab world) to raise CSR performance of Arab world by implementation of number of programs throughout countries in Middle East and North Africa. This will cover areas such as transparent reporting, corporate governance, responsible investment, anti-corruption and supply chain integrity. The partnership hopes that the region will eventually adopt ‘universally accepted principles for responsible business practices.’ Among 45 companies from 17 countries that signed up the initiative initially Bahrian Travel (Sudan), Barrick Gold Corporation (Canada), Empresa de Energia de Bogota (Colombia), Mas Holdings (Sri Lanka), Mousour (Egypt), Rajawali Corpora (Indonesia), Sinopec (China), and Toks (Mexico).

In a recent initiative the US clothing retailers have promised to have safety standards for Bangladesh suppliers in place. The businesses that are part of 'Alliance for Bangladesh Worker Safety' confirmed that the initiative taken up by the retailers is now up and successfully running. The standards for Safety are laid down and communicated to factory managers along with safety training being organized for workers. The factory inspections will be the future step with factory owners being accountable for safety renovations in the factory employment US\$50 million low cost Inan fund provided by Alliance members. A similar initiative, 'Accord on Fire and Building Safety in Bangladesh', has been joined by more than 30 mainly European brands and retailers.

'The international Organization for Standardization' will soon come up with global standard defining the responsible use of private security companies. The ISO standards will include all areas of operation of security firms, including the risk of human rights abuses. The standards will give outline of the management systems and will provide guidance to private security companies on areas such as how to manage risks and how to comply with human rights codes. It will also educate companies about demonstrating accountability to the International Code of Conduct for Private security service Providers, which was set up in 2010 and has around 600 signatories.

"The Companies Bill 2011" that will make it compulsory for companies to spend 2% of their profits on CSR has finally been approved by Indian parliament and with this India has become the first nation to set out mandatory spending levels on corporate responsibility. The bill was passed by lower house, the Lok Sabha, in December 2012, but was subjected to certain delays. The terms of the legislation state all businesses with a market capitalization of more than five billion rupees(US\$82 million)or average annual net profits over a three-year period of 500 crore rupees (US\$ 9 million)must spend at least 2% of their profits on CR activities. There is no legal sanction if the fail to do so, but if they don't then they must provide an urgent explanation to the government as to why not. However, there are still some questions that remain unanswered including the definition of corporate responsibility that government would consider. As it stands the Bill appears to allow companies themselves to determine what 'CR activity' is.

CSR in India

CSR is not a new concept in India. Ever since their inception, corporate like the Tata Group, the Group, and Indian Oil Corporation, to name a few have been involved in serving the community. Through donations and charity events, many other organizations have been doing their part for the society. The basic objective of CSR in these days is to maximize the company's overall impact on the society and stakeholders. CSR policies, practices and programs are being comprehensively integrated by an increasing number of companies throughout their business operations and processes. A growing number of corporate feel that CSR is not just another form of indirect expense but is important for protecting the goodwill and reputation, defending attacks and increasing business competitiveness.

Companies have specialized CSR teams that formulate policies, strategies and goals for their CSR programs and set aside budgets to fund them. These programs are often determined by social philosophy which have clear objectives and are well defined and are aligned with the mainstream business. The programs are put into practice by the employees who are crucial to this process. CSR programs ranges from community development to development in education, environment and healthcare etc.

For example, a more comprehensive method of development is adopted by some corporations such as Bharat Petroleum Corporation Limited, Maruti Suzuki India Limited. Provision of improved medical and sanitation facilities, building schools and houses, and empowering the villagers and in process making them more self-reliant by providing vocational training and a knowledge of business operations are the facilities that these corporations focus on. Many of the companies are helping other peoples by providing

them good standard of living. Mahindra & Mahindra carries out different CSR activities which focus on girl child, farmers and youth through programmes in domains like public health, education and environment. UltraTech Cement is involved in CSR activities across 407 villages in India with an aim to create self-reliance and sustainability.

Also, corporate increasingly join hands with non-governmental organizations (NGOs) and use their expertise in devising programs which address wider social problems. Similarly, Greenply Industries Limited under the leadership of Shobhan Mittal, CEO and joint-Managing Director, formed Greenply Foundation to carry out CSR activities for the company. Greenply CSR has partnered with Rural Development Institute (RDI) of the Himalayan Institute Hospital Trust (HIHT) and started a healthcare initiative in Tizit, Nagaland which aims to influence reproductive and sexual health behavior of women and adolescents in the area.

Another initiative of Green ply Foundation is the 'Carpenter Guru' mobile application which is a part of the Carpenter Training program designed and implemented by the Foundation. Training is conducted by the Foundation for carpenters, in order to equip them with modern carpentry techniques, knowledge of modern material and skills to improve their livelihoods. More than 1,500 carpenters and contractors across Delhi, Kolkata and Bhopal have directly benefitted from this training program so far.

CSR has gone through many phases in India. The ability to make a significant difference in the society and improve the overall quality of life has clearly been proven by the corporate. Not one but all corporate should try and bring about a change in the current social situation in India in order to have an effective and lasting solution to the social woes. Partnerships between companies, NGOs and the government should be facilitated so that a combination of their skills such as expertise, strategic thinking, manpower and money to initiate extensive social change will put the socio-economic development of India on a fast track.

Law

Under the Indian Companies Act, 2013, any company having a net worth of rupees 500 crore or more or a turnover of rupees 1,000 crore or more or a net profit of rupees 5 crore or more has to spend at least 2% of last 3 years average net profits on CSR activities as specified in Schedule VII of the Companies Act, 2013 and as amended from time to time. The rules came into effect from 1 April 2014.

SEBI, as per its notification on August 13, 2012, has mentioned that enterprises are accountable to the larger society and "adoption of responsible business practices in the interest of the social set-up and the environment are as vital as their financial and operational performance". SEBI has mandated the inclusion of Business Responsibility Reports as part of the annual reports of the Top 100 listed entities based on market capitalization at BSE and NSE. It is mandatory to make these reports available on the website of the company. In 2016, SEBI extended this requirement to the Top 500 listed companies.

Chapter 4

Tata Group and CSR

Ranging from steel, automobiles and software to consumer goods and telecommunications the Tata Group operates more than 80 companies. It has around 200,000 employees across India and thus has the pride to be nation's largest private employer. Mr. Ratan N. Tata has led the eminent Tata Group successfully. He was trained as an architect at New York's Cornell University but he chose to enter the family business. He assumed the Chairmanship of the Group in 1991. Named Business Man of the Year for Asia by Forbes in 2004, Mr. Ratan Tata serves on the board of the Ford Foundation and the program board of the Bill & Melinda Gates Foundation's India AIDS initiative. Tata Group chairman Ratan Naval Tata has stepped down to pass on the entire responsibility to Cyrus Mistry. Under Tata, the group went through major organizational phases — rationalization, globalization, and now innovation, as it attempts to reach a reported \$500 billion in revenues by 2020-21, roughly the size of what Walmart is today.

Approximately two third of the equity of the parent firm, Tata Sons Ltd., is held by philanthropic trusts endowed by Sir Dorabji Tata and Sir Ratan Tata, sons of Jamsetji Tata, the founder of today's Tata empire in the 1860s. Through these trusts, Tata Sons Ltd. utilizes on average between 8 to 14 percent of its net profit every year for various social causes. Even when economic conditions were adverse, as in the late 1990s, the financial commitment of the group towards social activities kept on increasing, from Rs 670 million in 1997-98 to Rs 1.36 billion in 1999-2000. In the fiscal year 2004 Tata Steel alone spent Rs 45 crore on social services.

Tata is accredited to initiate various labor welfare laws. For example- the establishment of Welfare Department was introduced in 1917 and enforced by law in 1948; Maternity Benefit was introduced in 1928 and enforced by law in 1946. A pioneer in several areas, the Tata group has got the credit of pioneering India's steel industry, civil aviation and starting the country's first power plant. It had the world's largest integrated tea operation. It is world's sixth largest manufacturer of watches (Titan).

4.1 Recognition of CSR

In a free enterprise, the community is not just another stakeholder in business but is in fact the very purpose of its existence." - Jamsetji Nusserwanji, Tata Founder, Tata Group.

"Corporate Social Responsibility should be in the DNA of every organization. Our processes should be aligned so as to benefit the society. If society prospers, so shall the organization..." - Manoj Chakravarti, G M - Corporate Affairs & Corporate Head - Social Responsibility, Titan Industries Limited in 2004.

Corporate Social Responsibility has always been taken care of by the Tata group. The founder Mr. Jamshedji Tata used to grant scholarships for further studies abroad in 1892. He also supported Gandhiji's campaign for racial equality in South Africa. Tata group has given country its first science center and atomic research center. "The wealth gathered by Jamsetji Tata and his sons in half a century of industrial pioneering formed but a minute fraction of the amount by which they enriched the nation. Jamshed Irani, Director, Tata Sons Ltd, says, "The Tata credo is that 'give back to the people what you have earned from them'. So from the very inception, Jamshetji Tata and his family have been following this principle." (a statement on the Tata group's website www.tata.com) .

In July 2004, B. Muthuraman, Managing Director, Tata Steel Limited (TISCO) announced that in future TISCO would not deal with companies, which do not conform to the company's Corporate Social Responsibility (CSR) standards. Speaking at the annual general meeting of the Madras Chamber of Commerce and Industry, He stated, "We will not either buy from or sell to companies that do not measure up to Tata Steel's social responsibility standards."

4.2. Introducing Changes in the Company's Article and Rules for Sustaining CSR Clause No. 10 of Tata Group

“A Tata Company shall be committed to be a good corporate citizen not only in compliance with all relevant laws and regulations but also by actively assisting in the improvement of the quality of life of the people in the communities in which it operates with the objective of making them self reliant. Such social responsibility would comprise, to initiate and support community initiatives in the field of community health and family welfare, water management, vocational training, education and literacy and encourage application of modern scientific and managerial techniques and expertise. This will be reviewed periodically in consonance with national and regional priorities. The company would also not treat these activities as optional ones but would strive to incorporate them as integral part of its business plan. The company would also encourage volunteering amongst its employees and help them to work in the communities. Tata companies are encouraged to develop social accounting systems and to carry out social audit of their operations.”

Amendments were made to the Articles of Association of the major Tata group companies in the 1970s. Newly included was an article stating that the "company shall be mindful of its social and moral responsibilities to consumers, employees, shareholders, society and the local community. To institutionalize the CSR charter, a clause on this was put into the group's 'Code of Conduct.' This clause states that group companies had to actively assist in improving quality of life in the communities in which they operated. All the group companies were signatories to this code. CSR was included as one of the key business processes in TISCO. It was one of the eight key business processes identified by TISCO's management and considered critical to the success of the company.

4.4 CSR Activities of Tata Companies & Societies

Through the following companies and societies Tata group keeps on heading towards the fulfillment of corporate social responsibility –

4.4.1 Tata Steel

Tata Steel has adopted the Corporate Citizenship Index, Tata Business Excellence Model and the Tata Index for Sustainable Development. Tata Steel spends 5-7 per cent of its profit after tax on several CSR initiatives.

a) Self-Help Groups (SHG's)

Over 500 self-help groups are currently operating under various poverty alleviation programs; out of which over 200 are engaged in activities of income generation thorough micro enterprises. Women empowerment programs through Self-Help Groups have been extended to 700 villages. From the year 2003 to 2006, the maternal and infant survival project had a coverage area of 42 villages in Gamharia block in Seraikela Kharsawa and a replication project was taken up in Rajnagar block. For providing portable water to rural communities 2,600 tube wells have been installed for the benefit of over four Lakh people.

b) Supports Social Welfare Organizations

Tata Steel supports various social welfare organizations. They include;

- Tata Steel Rural Development Society
- Tribal Cultural Society
- Tata Steel Foundation for Family Initiatives
- National Association for the Blind
- Shishu Niketan School of Hope
- Centre for Hearing Impaired Children
- Indian Red Cross Society, East Singhbhu

c) Healthcare Projects

In its 100th year, the Tata Steel Centenary Project has just been announced. The healthcare projects of Tata Steel include facilitation of child education, immunization and childcare, plantation activities, creation of awareness of AIDS and other healthcare projects.

d) Economic Empowerment

A program aiming at economic empowerment through improvised agriculture has been taken up in three backward tribal blocks in Jharkhand, Orissa and Chhattisgarh. An expenditure of Rs 100 crore has been estimated for the purpose and this program is expected to benefit 40,000 tribal living in over 400 villages in these three States

e) Assistance to government

Tata Steel has hosted 12 Lifeline Expresses in association with the Ministry of Railways, Impact India Foundation and the Government of Jharkhand. It has served over 50,000 people. Five thousand people have got surgical facilities and over 1,000 people received aids and appliances. Over seven lacks rural and another seven Lac urban population have been benefited by the CSR activities of Tata Steel. The National Horticulture Mission program that has been taken up in collaboration with the Government of Jharkhand has benefited more than a thousand households. In collaboration with the Ministry of Non Conventional Energy and the Confederation of Indian Industry, focus is laid on renewable energy aiming at enhancing rural livelihood.

4.4.2 Tata Motors:

a) Pollution Control

Tata Motors is the first Indian Company to introduce vehicles with Euro norms. Tata Motors' joint venture with Cummins Engine Company, USA, in 1992, was a major effort to introduce emission control technology in India. To make environment friendly engines it has taken the help of world-renowned engine consultants like Ricardo and AVL. It has manufactured CNG version of buses and also launched a CNG version of its passenger car, the Indica. Over the years, Tata Motors has also made investments in the establishment of an advanced emission-testing laboratory.

b) Restoring Ecological Balance

Tata Motors has planted 80,000 trees in the works and the township and more than 2.4 million trees have been planted in Jamshedpur region. Over half a million trees have been planted in the Poona region. The company has directed all its suppliers to package their products in alternate material instead of wood. In Pune, the treated water is conserved in lakes attracting various species of birds from around the world.

c) Employment Generation

Relatives the employees at Pune have been encouraged to make various industrial co-operatives engaged in productive activities like re-cycling of scrap wood into furniture, welding, steel scrap baling, battery cable assembly etc. The Tata Motors Grihini Social Welfare Society assists employees' women dependents; they make a variety of products, ranging from pickles to electrical cable harnesses etc; thereby making them financially secure.

d) Economic Capital

In Lucknow, two Societies - Samaj Vikas Kendra & Jan Parivar Kalyan Santhan have been formed for rural development & for providing healthcare to the rural areas. These societies have made great efforts for health, education and women empowerment in rural areas.

e) Human Capital

Tata motors have introduced many scholarship programs for the higher education of the children. Through a scholarship program Vidyadhanam, the company supports 211 students. Out of these

students 132 students are from the marginalized sections of the society. These students get books, copies and other study materials. They also undergo different kinds of workshops, creative & outdoor sessions and residential camps as well.

The company has entered into Public-Private Partnership (PPP) for upgrading 10 Industrial Technical Institutes (ITI) across the country.

f) Natural Capital

On the World Environment Day, Tata Motors has launched a tree plantation drive across India and countries in the SAARC region, Middle East Russia and Africa. As many as 25,000 trees were planted on the day. Apart from this more than 100,000 saplings were planted throughout the monsoon.

4.4.3 Tata Chemicals Ltd (TCL)

Tata Chemicals is making an effort for sustainability. Sustainability for the group means honesty and transparency towards stakeholders, environmental protection, generating economic value, promoting human rights and creating social capital. Tata Chemicals supports the UN Global Compact and is committed to reporting its sustainability performance in accordance with GRI (Global Reporting Initiatives) guidelines. Its main operations for environment protection include optimal use of resource, finding and/or generating alternative sources of fuel and raw materials, and maximizing reuse and recycling. All in all they have the policy of avoid, reduce and reuse'. The company runs a rural development program at Okhamandal and Babrala.

Tata Chemicals Limited was one of the first organizations to hold an Impact camp, which was held at Mithapur in the year 1982, providing eye care to hundreds of patients at the Mithapur Hospital. Tata Chemicals Limited was also the first organization to run world's first hospital on wheels - the Life Line Express, through Jamnagar district for the first time between November 21, 2004 and December 21, 2004.

4.4.4 Tata Tea

Tata Tea has been working hard since the 1980s to fulfill the needs of specially-able people. It has set up the **Srishti Welfare Centre at Munnar, Kerala**; its various programs provide education, training and rehabilitation of children and young adults with special needs.

Srishti has four projects:

- a) The DARE School
- b) The DARE strawberry preserve unit
- c) Athulya
- d) Aranya.

Tata Tea's welfare officers help identify and encourage relatives or children of employees who are handicapped to join the Welfare Centre for special education and rehabilitation.

- **The DARE**

It provides the students with training in basic academics, self-help skills and skills like gardening, cooking, weaving etc. Children are taught to paint and some of the paintings are printed and sold as greeting cards. The sales proceeds of which are used back into the units.

- **The DARE strawberry**

It preserves unit trains youngsters to make natural strawberry preserve. The trainees are paid for the work; they receive social cover, free medical aid and other benefits.

- **Athulya**

It has two units –

- (i) A vocational training center that imparts training in stationery-making
- (ii) A handmade paper-making unit which trains physically challenged persons in the art of making recycled paper

- **Aranya**

This project was started to nurture the lives of the disabled and also to revive the ancient art of natural dye. Individuals are given training in various natural dyeing techniques including block printing, tie and dye, batik work, etc. Their products are sold in and outside the country. Tata Tea's Jaago Re! Campaign exemplifies the Social-Cause Marketing Initiatives.

4.4.5 Titan

Corporate social responsibility is a basic element of TITAN Group's governing objective and one of its corporate values. In its corporate philosophy CSR is defined as doing less harm and more good by adopting the following practices:

- Respecting and supporting local communities
- Caring for the employees
- Being an active member of society
- Committed to sustainable development
- Putting safety(at work) first

Titan has employed 169 disabled people in blue collar workforce at Hosur.

4.4.6 TISCO

TISCO was awarded The Energy Research Institute (TERI) award for Corporate Social Responsibility (CSR) for the fiscal year 2002-03 in recognition of its corporate citizenship and sustainability initiatives. As the only Indian company trying to put into practice the Global Compact principles on human rights, labor and environment, TISCO was also conferred the Global Business Coalition Award in 2003 for its efforts in spreading awareness about HIV/AIDS.

4.4.7 TELCO

TELCO, Puna has started community development activities for the benefit of TELCO families and local residents in 1973 with the following objectives:

1. To create social awareness in all the employees and their families, to promote congenial mutual relations amongst them, to improve personal and environmental hygiene and health
2. To help the families of employees develop better living standards by organizing extension education programs, training in various trades/skills and providing opportunities to earn additional income. TELCO is fighting against Leprosy at Jamshedpur.

4.4.8 Tata Consultancy Services (TCS)

TCS aims at the Tata group's philosophy of building strong sustainable businesses community .The elements that make for strong corporate sustainability at TCS include the following: A fair, transparent corporate governance, a strong strategy for long-term growth, Best-in-class HR processes, initiatives for community betterment and welfare.

In 2010-11, TCS supported its local communities in the United States: supported the victims of the 2010 Chilean earthquake, conducted IT educational programs for high school students in Cincinnati, raised support and awareness for diabetes prevention through a series of marathon sponsorships

Tata Consultancy Services runs an adult literacy program. Indian government launched Saakshar Bharat, an adult education program in 2009 and the program will now go online via TCS'partnership. The scheme, aimed at female literacy aims to make literate 70 million people, of which at least 85 percent are women literate and the program has already been rolled out in 167 districts across 19 states.

4.4.9 Tata Archery Academy

The Tata Archery Academy was established in Jamshedpur in 1996. The academy has all the training facilities like highly efficient coaches, archery grounds, equipment from India and abroad. It also provides hostel and multi gymnasium facilities for its cadets.

After a rigorous selection process being carried all over India, the Academy selects boys and girls between the age group of 13 to 18 years for the four years course and it provides the training during which the cadets

are also imparted with formal education. Some of the major championships where the of the Tata Archery Academy cadets have participated and have won several medals are Junior world Archery Championship, Senior World Archery Championship, Asian Archery Championship, Commonwealth Games and Asian Games.

4.4.10 TQMS

Tata Quality Management Services (TQMS - a division of Tata Sons) had been entrusted with the task of institutionalizing the Tata Business Excellence Model (TBEM). The TBEM provides each company with a wide outline to help it improve business performance and attain higher levels of efficiency and productivity. It aims to facilitate the understanding of business dynamics and organizational learning. TBEM is a customized to-Tata' adaptation of the globally renowned Malcolm Baldrige model. TBEM model focuses on seven core aspects of operations: leadership, strategic planning, customer and market focus, measurement, analysis and knowledge management, human resource focus, process management and business results. Performance is measured in absolute points; companies have to achieve a minimum of 500 points (out of 1,000) within four years of signing the BEBP agreement.. TQMS helps Tata companies use the model to gain insights on their business strengths and opportunities for improvement. This is managed through an annual process of assessment and assurance. The model, through its regular and calibrated updates, is used by Tata companies to stay in step with the ever-changing business environment.

TBEM based performance excellence goals:

Basically TBEM Criteria is designed to help organizations use an integrated approach to performance management that results in delivery of ever-improving value to customers and stakeholders, contributing to organizational sustainability improvement of overall organizational effectiveness organizational and personal learning.

4.4.11 TCSR

Tata Chemicals Limited (TCL) set up the Tata Chemicals Society for Rural Development (TCSR) in 1980 to promote its social objectives for the communities in and around Mithapur, where its facility is located. This service was further extended to the communities in and around its Babrala and Haldia facilities. Through Tata Chemicals Society for Rural Development (TCSR) Tata Chemicals works to improve the quality of life of the people and communities. It also aims at supporting sustainable development, which is the central theme of the company's corporate philosophy. It works to protect and nurture the rural populations in and around TCL's facilities, and assists people in attaining self-sufficiency in natural resource management, livelihood support. It also aims at the building of health and education infrastructure i.e. schools and hospitals, maternity centers etc.

The initiatives that TCSR is involved in include:

- Agricultural development
- Animal husbandry
- Watershed development
- Education
- Rural energy
- Women's programs
- Relief work

4.4.12 Tata Relief Committee

Tata Relief Committee (TRC) works to provide relief at disaster affected areas. During natural calamities there are two phases of assistance - (a) relief measures and (b) rehabilitation program.

After the Gujarat earthquake the group built 200 schools in two years and they rendered help during the Orissa floods when people lost cattle's. Even after the Tsunami disaster members of TRC immediately reached the places and supplied the things required.

4.4.13 Tata Council for Community Initiatives (TCCI)

TCCI was established in 1994. TCCI's mission states: "We will work together to be and to be seen as, a group which strives to serve our communities and the society at large". TCCI is also involved in assisting Tata companies maintain sustainability reporting the guidelines of Global Reporting Initiative (GRI). It is the focal point for the UN Global Compact in India, which has 42 Tata companies as signatories, the highest in the world from a single business group.

In collaboration with the United Nations Development Programme (India), TCCI has crafted the Tata Index for Sustainable Human Development, aiming at directing, measuring and enhancing the community work those Tata enterprises is undertaking for the upliftment and welfare of the people.

4.5 Tata Corporate Sustainability Policy

"No success or achievement in material terms is worthwhile unless it serves the needs or interests of the country and its people. - J R D

Tata The corporate policy of the group encompasses the sustainable development of all the stakeholders. The major points included in the corporate policy are following:

- Demonstrate responsibility and sensitivity to biodiversity and the environment
- Comply with rules and regulations relating to environment
- constantly upgrade technology and apply state-of-the-art processes and practices with institutional arrangements that will combat larger issues like climate change and global warming
- Create sustainable livelihoods and build community through social program pertaining to health, education, empowerment of women and youth, employee volunteering,
- Find ways to enhance economic human, social and natural capital for bringing and maintaining a balance among business, society and environment.

4.6 Dedications to the Nation at a Glance

4.6.1 Tata Health Infrastructure

- Tata main hospital at Jamshedpur
- ICU in Joda and Balangpur
- CHC in Bari and Kuhika
- Hospitals in Gobarghati, sukinda, joda, belpahar, belipada and bamnupal
- Lifeline Express- the hospital on wheels
- Mobile health clinics
- Centre for hearing impaired children

4.6.2 Tata Educational Infrastructure

- Institute of mathematics
- Sukinda college
- Joda college centenary Learning centre at XIMB
- J N Tata Technical Education centre
- School of hope
- Shishu Niketan

4.6.3 Tata Sports Infrastructure

- Tata athletics academy
- Tata archery academy
- Tata Football academy
- Tata steel adventure foundation
- Sports feeder centers
- Stadium at keonjhar

4.6.4 Preservation of culture & Heritage

- Contribution to setting up national Center for performing arts Mumbai

- Tribal cultural centers showcases legacy of nine tribes Jharkhand and Orissa.
- Gramshree mela activities

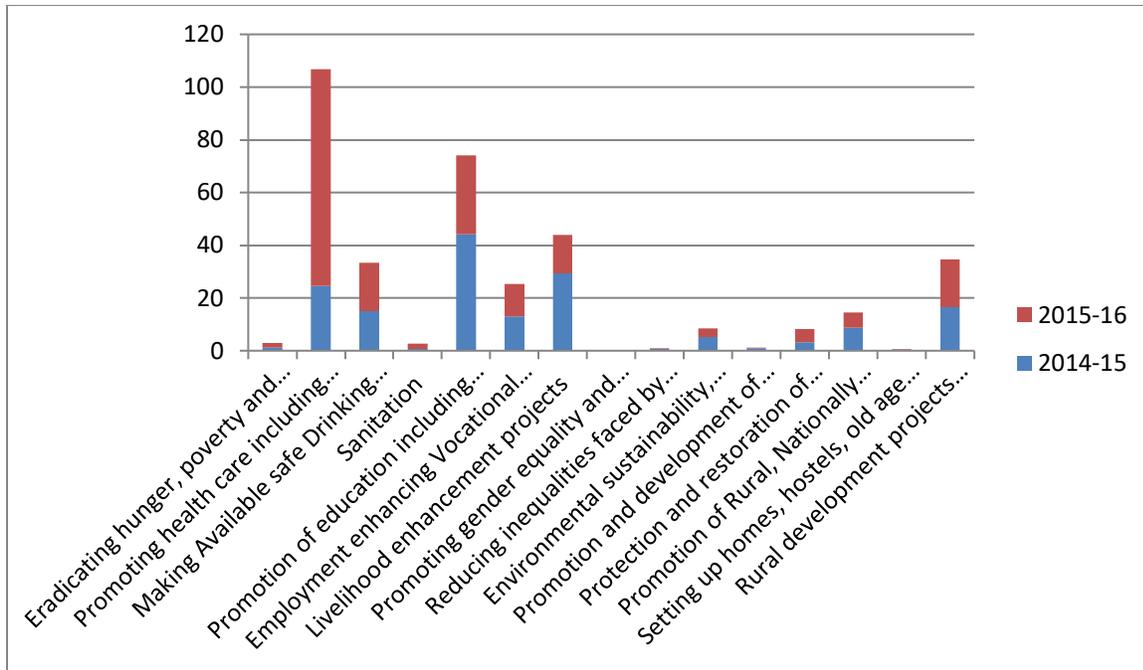
Chapter 5

Data Analysis and Interpretation

TATA STEEL

(RS. in crore)

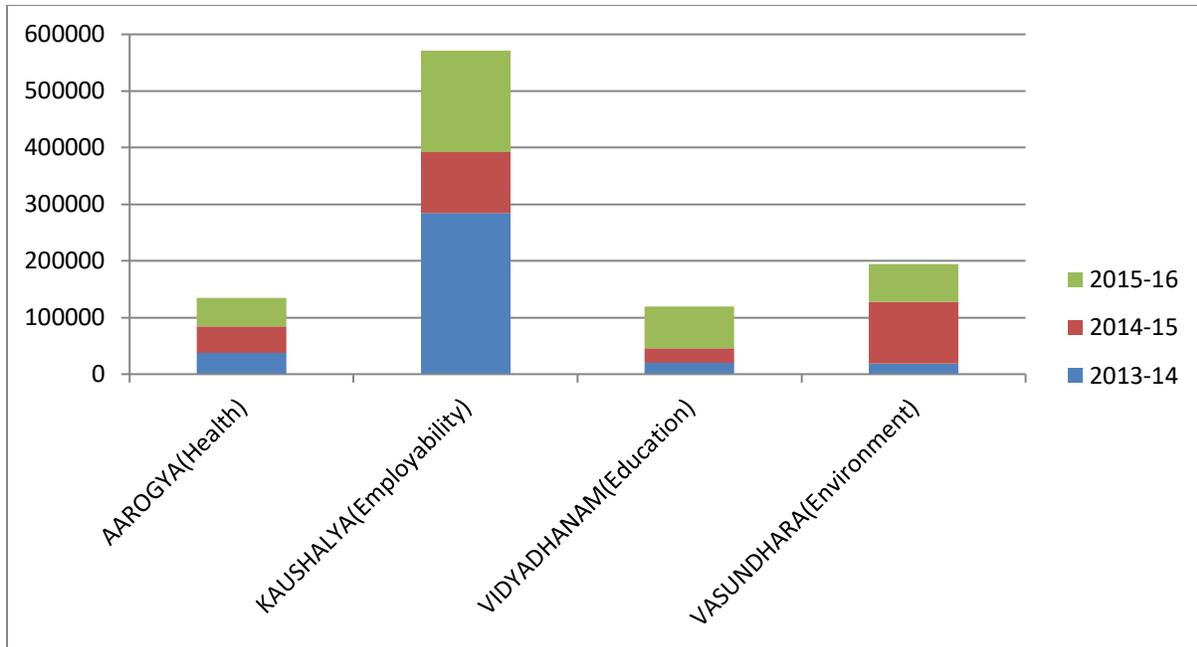
CSR project or activity identified	2014-15	2015-16
1.Eradicating hunger, poverty and malnutrition	1.21	1.65
2.Promoting health care including preventive Healthcare	24.48	82.34
3.Making Available safe Drinking Water	14.93	18.31
4.Sanitation	0.57	2.14
Total	41.19	104.44
5.Promotion of education including special education	44.25	29.93
Total	44.25	29.93
6.Employment enhancing Vocational skills especially to Women, Children, Differently able	13.06	12.28
7.Livelihood enhancement projects	29.34	14.64
8.Promoting gender equality and empowering women	0.01	0.03
9.Reducing inequalities faced by socially and economically backward groups	0.67	0.35
Total	43.08	27.30
10.Environmental sustainability, protection of flora & fauna, agro forestry, animal welfare, resource conservation, maintaining quality of soil, air, water	5.11	3.27
Total	5.11	3.27
11.Promotion and development of traditional arts and handicrafts	0.85	0.41
12.Protection and restoration of national heritage, Promotion of art, culture, handicrafts, setting up public libraries etc	3.22	4.95
Total	4.07	5.36
13.Promotion of Rural, Nationally recognized, Paralympics and Olympic sports especially training	8.61	5.99
14.Setting up homes, hostels, old age homes, day care centers for women, orphan, elderly	0.34	0.43
15.Rural development projects (infrastructure and other developments)	16.64	18.00
Total	16.98	18.43
Total Direct expenses of projects & programmers (A)	163.29	194.72
Overhead Expenses (restricted to the 5% of total CSR expenditure) (B)	8.17	9.74
Total (A) + (B)	171.46	204.46



In this above chart it is recognize that the expenses of CSR activity of TATA STEEL is reportedly increased in financial year 2015-16 compare to preceding financial year 2014-15. In financial year 2014-15 the company incurred 171.46 crore where as in the financial year 2015-16 the company incurred 204.46 crore. That means is the company increases their CSR activity expenditure in 2015-16 by 19.2465% (approx) or 33 crore relating to the preceding year 2014-15.

TATA MOTORS

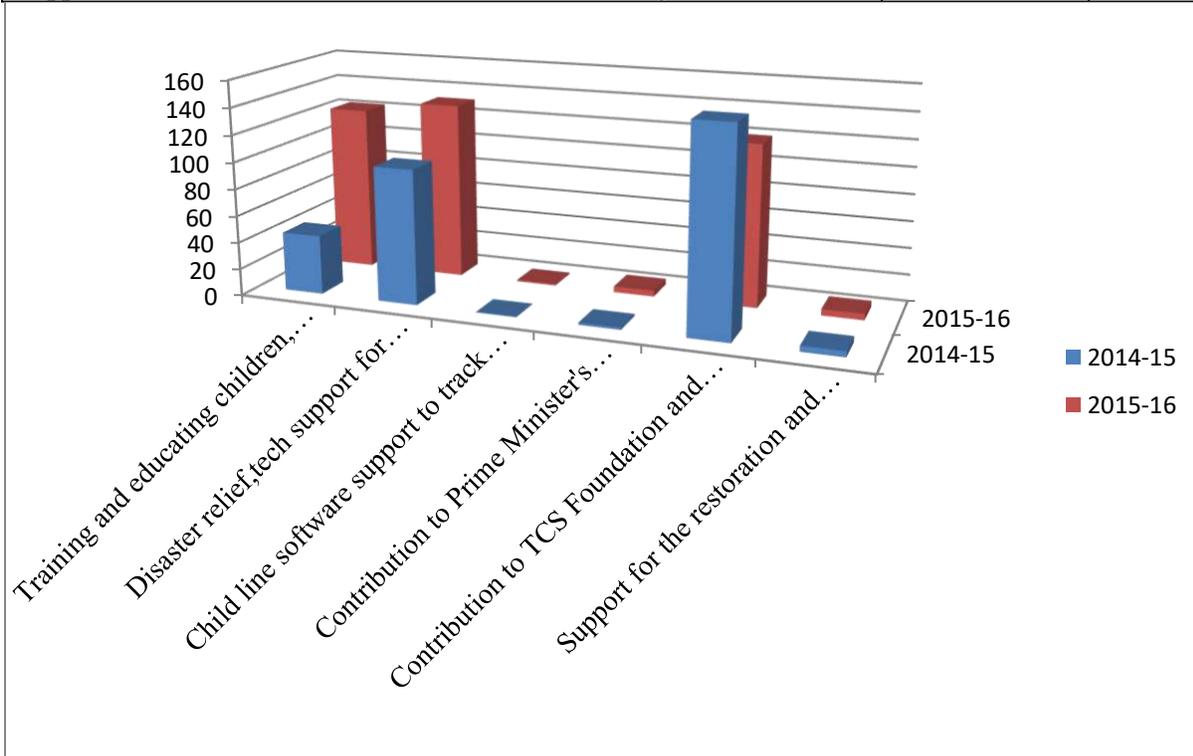
Name of the Project	2013-14	2014-15	2015-16
AAROGYA(Health)	More than 2,84,000 persons were benefited in 2013-14	Addressing Child Malnutrition=1102 Health Awareness among Females=9385 Preventive & Curative Health Services=98083	<i>Amruthdhara</i> has made a difference to 16,000 people while 178,200 have benefitted from their health programmed.
VIDYADHANAM(Education)	More than 37,000 children were benefited in 2013-14	Scholarships (Secondary Classes)=1502 Special Coaching(Secondary Classes)= 24784 School Infra improvement= 12175 Co-curricular activities=8314	Their education programmed has helped 51,000 students.
KAUSHALYA(Employability)	More than 20,000 youth were benefited in 2013-14	Professional Driver Training(Novice and Refresher)= 22171 Motor Mechanic Vehicle Training=784 Training in Non-Auto Trades=1110 Training in Agriculture & Allied Trades=1837	During the year, they skilled 73,000 youth. They also engage with community-based groups of women and farmers to help them earn supplementary incomes through our agriculture and allied programmers.
VASUNDHARA(Environment)	More than 18,500 people participated in our environmental awareness programmed in 2013-14	Environmental Awareness among Students= 15263 Solar Study Lamps for Students=8500 Tree Plantation=85140	Their sessions have witnessed 12,600 participants. They have also planted 67,000 trees on wastelands in an attempt to increase the green cover.
AMRUTDHARA(Drinking Water Project)		Drinking Water Projects 16163	



In this above bar chart it is compared that the CSR activity of TATA MOTORS in different years and different field of social activity. Here in the project aarogya, More than 2, 84,000 were benefitted (2013-14), and a comparative study from 2014 to 2016 has demonstrated that through developmental health programmes, like ‘Amruthdhara’ etc. the health standards are improved day by day. Through this Vidyadhanam project, more than 37, 000 children were benefitted (2013-14), and it increased over the years through special Coaching classes programmes, School improvements and co curricular activities. The other programmes like “KAUSHALYA” “VASUNDHARA” and “AMRUTDHARA”, it clearly shows that the company’s expenditure over CSR is gradually increased and they are trying to gather more number of people to come under the tree by giving employment, environmental support etc.

TCS

CSR Project or Activity identified	2014-15 (Rs in Crore)	2015-16 (Rs. In Crore)
Training and educating children, women, elderly, differently-able, scholarships, special education and increasing employability	43.9	123.18
Disaster relief, tech support for hospitals including cancer institute's, financing hygienic sanitation	100	131.93
Child line software support to track missing children	0.26	1.09
Contribution to Prime Minister's National Relief Fund & other Central Government Funds	1.59	4.44
Contribution to TCS Foundation and other Trusts engaged in socio-economic development and relief work	150	120.00
Support for the restoration and renovation of the heritage structure	4.2	4.70



In the above chart it is compared that two financial years' (FY 2014-15 and 2015-16) CSR data of TCS and we found that that the company spent in financial year 2015-16 for Training and educating children, women, elderly, differently-able, scholarships, special education and increasing employability in a significant way related to preceding year 2014-15. TCS spend rupees 79.28 crore more than previous year 2014-15. The others programmes like Disaster relief, tech support for hospitals including cancer institute's, financing hygienic sanitation, Child line software support to track missing children etc the company spent well related to previous year.

Chapter 6

Summary of Findings

6.1 Findings

This study has important implications for Information Technology industry with regards to Corporate Social Responsibility. The findings obtained from the research are as follows.

1. 35 companies replied that CSR is a part of their business strategy
2. More and more companies are realizing that CSR has become a part of their business strategy.
3. Tata group distinctly emerges as a performer in not only adopting CSR, but also in managing it.
4. The managers of selected companies are not provided with any training to deal with social issues. The training to develop expertise while dealing with social issues is not considered important was the opinion of respondents.
5. The companies follow code of ethics to a great extent with respect to their stakeholders. This means that the companies are desirous of maintaining strong and ethical relations with their respective stakeholders.
6. Tata Group includes supporting educational institutions, cultural development, rural development, and providing relief to the poor.
7. Tata Group gives importance to Human Resource as a part of Corporate Social Performance. This indicates that these companies treat employees as valuable assets and team members, and not just contract employees.
8. Due to globalization the world has shrunk because of which crossing the border of the country for doing business has become a common feature
9. The government perceives CSR as a contribution to the nation's sustainable development goals. Essentially, it is about how a business takes into account the economic, social and environmental impact of the way in which it operates.
10. The study postulates that an organization cannot simply adopt and implement the corporate social responsibility practices without considering important factors.
11. This study highlights the culture of the firm and its business ethics as factors for CSR activates. A combination of these variables will influence the degree to which an organization can be deemed to be CSR oriented.
12. Ethical climate for decision making is highly accepted by all the companies
13. Acceptance of CSR by the companies having higher annual turnover is more than the companies having lower annual turnover.
14. The companies under study also keep record of E-Waste and make efforts to curtail it.

6.2 Conclusion

Social changes in society are successful when they consciously and responsibly involved the most significant force. Interaction of political, social and economic subjects, based on the principles of social partnership, ensures stable and gradual development of the state. With the increasing importance of non-financial factors of sustainable development, such as social stability, environmental safety, updated theoretical and practical aspects of social responsibility.

Relevance of research associated with the processes of globalization, reinforcing the role of large companies in the economic development. Nation-states are gradually yielding to pressure multinational corporations and economic independence, and social policy. Counter this trend is to be co-ordinate action, ensuring the achievement of indicators of social responsibility, which comply with international standards and principles of sustainable development.

Market globalization, the transformation of the national in the world, identifies the need for an economic entity of innovation in engineering, technology, labor and management, based on the use and application of science and best practices. At the center of all these phenomena is the intellectual capital - the quality

of the labor force and motivation. The lack of comprehensive scientific developments in the field of modern management, social technologies complicates the interaction of domestic enterprises, government and society. In the implementation of socially responsible policy, the role of corporate governance, ensuring the achievement of social, economic and environmental goals of the enterprise. Science-based decision management problems can provide an enabling social and psychological condition of the enterprise, to influence the development of relations with stakeholders in a timely manner to prevent social tensions, without violating the principles of economic efficiency.

Social responsibility is also manifested in the implementation of commitments made at the level of functional units of the organization, especially top management. Develop procedures for social policy, social programs, the performance criteria must comply with the rules and principles of public law. One way of forming objective information about the social impact of the company is to evaluate the effectiveness of non-financial risks, including - social. Actual development of common approaches to assessing the effectiveness of the implementation of socially responsible policies. Evaluation of the quality management affects the position of the company in the financial markets, maintaining a conflict-existence of society, sustainable development.

6.3 Suggestions

In the light of the findings of the study the following actions can be recommended for more effectiveness in Corporate Social Responsibility, the IT companies can perform.

1. The companies should make a deliberate attempt to formulate and incorporate social objectives into their economic objectives and Mission Statement.
2. Public disclosure of corporate information and activities involving social as well as economic matters should be made mandatory. Companies having a higher annual turnover should develop "corporate leadership" that would help low annual turnover companies to develop corporate citizenship in order to fulfill the role of citizenship.
3. There should be a willingness to discuss activities with third party or corporate rating organization i.e. accept formal and informal inputs from outside groups, which can be incorporated in decision making process. The managers should be given formal training in developing expertise in social performance. In case the organization cannot afford to allow their managers to fulfill social obligations then the management should use the expertise of external parties. It is strongly suggested that the companies create a CSR Officer, who would be involved in CSR activities for the company.
4. The high annual turnover companies should take the initiative to build a network of Industries to enhance environmental protection.
5. Philanthropy practiced by the companies should benefit the public at large, and not just some specific group or community, which is generally the practice. This could be achieved by working in association with NGOs.
6. Before tie- up with Non Government Organization company should asses the quality and performance of NGO
7. Every year budget must be increased because there is a greater scope and need in the society for its development.
8. Every year before allocating funds, there should be an appropriate survey conducted as to where the funds would be channelized; as sometimes the pattern of spending is regular and monotonous. After all CSR is Management Paradise hence there is a need for it to be undertaken carefully and with variations considering the evaluation at beneficiary level.
9. Company can take guidance from ISO 26000 for CSR
10. Company should follow the guidance in respect of CSR given by Ministry of Corporate Affairs
11. Company should avail services from the Consultants who are expert in CSR consulting field.

12. New Companies should contact established companies for CSR activity to perform in proper direction.
13. The positive approach of CSR by corporate for the development of the society will provide a great benefit to community in terms of customer satisfaction, economic development, job opportunity and overall improvement in standard of living.
14. At the same time corporate will also enjoy many benefits in terms of good image in the society, brand loyalty by customer, maximum profit and healthy competition in the global environment

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PROJECT REPORT

(Submitted for the Degree of M.Com in Accounting and Finance under
the West Bengal State University)

Title of the Project

Travel and Tourism of India
(Survive, Revive and Thrive in times of Covid-19)

Submitted By:

Name of the Candidate: **VIVEK KUMAR TRIVEDI**

Registration Number: **1071911401409**

Name of the College: **BHAIRAB GANGULY COLLEGE**

College Roll Number: **100**

Supervised By:

Name of the Supervisor: **DR. SURAJIT SENGUPTA**

Name of the College: **BHAIRAB GANGULY COLLEGE**

Month and Year of Submission

September/2021



ACKNOWLEDGEMENT

On the very outset of this project, I would like to extend my sincere and heartfelt obligations towards all the personages who have helped me in this endeavour. Without their active guidance, help, cooperation and encouragement, I would not have made a headway in the project.

I am ineffably indebted to **Dr. Surajit Sengupta Sir** for conscientious guidance and encouragement to accomplish this assignment. Also, I am extremely thankful and pay my gratitude to my supervisor for his valuable guidance and support on completion of this project in its presently.

I extend my gratitude to **BHAIRAB GANGULY COLLEGE** for giving me this opportunity.

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At last, but not least, gratitude goes to all of my **friends** who directly or indirectly helped me to complete this project report.

Any omission in this brief acknowledgement does not mean lack of guidance.

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SUPERVISOR'S CERTIFICATE

This is to certify that **Mr. VIVEK KR. TRIVEDI**, a student of **M.Com** in **Accounting and Finance** of **Bhairab Ganguly College** under the West Bengal State University has worked under my supervision and guidance for his Project Work and prepared a Project Report with the title "**Travel and Tourism of India (Survive, Revive and Thrive in times of Covid-19)**" which he is submitting, is his genuine and original work to the best of my knowledge.

Place: KOLKATA

Date: 1st September, 2021

Signature

Name: DR. SURAJIT SENGUPTA

Designation: Assistant Professor

Name of the college: BHAIKAB GANGULY
COLLEGE

STUDENT'S DECLARATION

I hereby declare that the Project Work with the title “**Travel and Tourism of India (Survive, Revive and Thrive in times of Covid-19)**” submitted by me for the partial fulfilment of the degree of **M.Com in Accounting and Finance** under the **Bhairab Ganguly College** is my original work and has not been submitted earlier to any other University/Institution for the fulfilment of the requirement of any course of study. I also declare that no chapter of this manuscript in whole or in part has been incorporated in this report from any earlier work done by others or by me. However, extracts of any literature which has been used for this report has been duly acknowledged providing details of such literature in the references.

Vivek kumar Trivedi

Signature

Name: VIVEK KUMAR TRIVEDI

Date: 1ST September, 2021

INTRODUCTION

BACKGROUND

In this research, I have taken the task of jotting down the situation of Travel and Tourism department of India pre and during the covid time.

Travel and Tourism is the largest service industry in India. It provides heritage, cultural, medical, business and sports tourism. The main objective of this sector is to develop and promote tourism, maintain competitiveness of India as tourist destination and improve and expand existing tourism products to ensure employment generation and economic growth. The Ministry of Tourism designs national policies for the development and promotion of tourism. In the process, the Ministry consults and collaborates with other stakeholders in the sector including various central ministries/agencies, state governments, union territories and private sector representatives. Concerted efforts are being made to promote niche tourism products such as rural, cruise, medical and eco-tourism. The Ministry of Tourism maintains the Incredible India campaign focused on promoting tourism in India.

The coronavirus (COVID-19), has affected people and businesses all over the world triggering a global economic crisis. The spread of the COVID-19 has caused an international health emergency because of its high risk and infection. The effect of the COVID-19 was strong that it immediately spread almost over 195 countries. Tourism industry is badly hit during the lockdown due to the restrictions imposed during the lockdown period. As the cases started to rise, the Government of India executed a complete lockdown in the country to regulate the spread of the pandemic. Travelling between the country was blocked by the countries due to pandemic. Travel & Tourism is considered to be one of the world's largest economic sectors as it creates jobs for many, generates revenue through exports, and generates prosperity all over the world. The travel and tourism aim to serve and support domestic and international business and leisure visitors. The travel industry, like airlines, hotels and restaurants, will shrink by 50% in 2020, creating a significant loss of jobs and revenue. According to the International Air Transport Association (IATA), Airlines worldwide are expected to lose a record of \$84 billion in 2020, more than three times the loss made during the Global Financial Crisis, most of the airlines are undergrounded. Hotels are closed due to a decreased

number of tourists and five-star hotels turning into quarantine facilities- restaurateurs see operating costs rising further because of social distancing, hygiene, and sanitation-related costs. Hence, it is a challenging task for the tourism industry to sustain during this crisis.

HISTORY

The history of tourism developed mainly through indirect sources in the early period. In India, in the early days of agricultural abundance, export of cash crops created an important trade link. Manufacture of iron-ore into steel for weaponry was another important item of trade by the later Vedic period. Tools and textiles were other renowned Indian products. Owing to the predominance of trade routes over – land crossing between Asia and Europe, trade tours were an important development in this period.

In the early days, pilgrimage or pilgrim travel assumed great importance. Ashoka the great, travelled a great deal in his eagerness to spread the doctrines of Buddha. Harsha was another great emperor who gently influenced by the Buddhist scriptures, built institutions and Dharamshalas for the travellers. Rest houses were built in towns and villages. A number of monasteries were also built for the pilgrims. This shows that travel facilities were much improved and travel was not a cumbersome experience.

Travelling for pleasure on the rivers and to the hills was a tradition started by the royal courts. However, such movement attracted all those who had business at the court to move with it from the heat and dust of the cities to the calm and serenity of the retreat. During the rule of the Mughals, the emperors travelled extensively and contributed towards resort development. Even today the remains of the past like the mile stones, sarais and a network of roads and paths that make all corners of this vast country accessible.

OBJECTIVE OF THE STUDY

The sole purpose of doing this project was to examine the situation of the Travel and Tourism industry of India pre and during the covid time. Hence, the important aspects of the project are listed below:

- To observe the department's condition before the pandemic period
- To show the contributions of different states in tourism of India
- To show various schemes/initiatives taken by the Government of India to promote domestic as well as international tourism
- To examine the contribution of different ministries of government prior to the onset of covid
- To understand the impact of covid on the industry
- To understand the different measures suggested by the Federation of Indian Chambers of Commerce and Industry

BRIEF REVIEW OF LITERATURE

- Dr. Vijayaragavan, T., "IMPACT OF TOURISM IN INDIAN ECONOMY". International Journal of Development Research Vol. 4, Issue. 12, pp. 2835-2839, December, 2014

This paper coins how tourism sector is significant for Indian economy. Developing country like India tourism has become one of the major sectors of the economy, contributing to a large proportion to GDP and employment opportunities. Tourism is one of the fastest growing service industries in the country with great potentials for its further expansion and diversification. Tourism industry plays a major role in any country's economic development. It helps significantly to the country for creating the employment opportunities to the large number of people. Moreover, it is also one of the important engines to attract more foreign exchanges with its potential. This paper mentions the need to concentrate to have liberal policies, relaxation in taxes, comprehensive package and so on to influence tourist and foreign investment. There is also a need to increase the government's role to make India flourishing in tourism and established in the global market. India has rich source in tourism for the establishment of the brand. Of course, India has been launched the Incredible India to make tourism better.

CONCEPTUAL FRAMEWORK

Tourism Industry is a major source of income for government and employment in many countries across the world. It acts as a generator for employment, income, tax collections and foreign exchange earnings. The tourism industry became highly competitive; and therefore, accurate tourism demand forecasting is important to make an appropriate strategic and operational decision. The WTO has researched and found that nearly 120 million tourism jobs could be lost during the pandemic, which has never happened before in the history. This could implore US \$1.2 trillion loss of income in the tourism industry due to 850 to 1.1 billion lesser tourist arrivals in 2020. On an average tourism industry contributes almost 4.4% of GDP in developed nations and it generates almost 7% direct jobs. In 2020, the Tourism Industry in India has faced a revenue loss to the extent of Rs 1.25 trillion due to the close of hotels, railway suspension, road and flight operations since the spread of the COVID-19 virus infection.

PRESENTATION OF DATA ANALYSIS AND FINDINGS

PRE-COVID

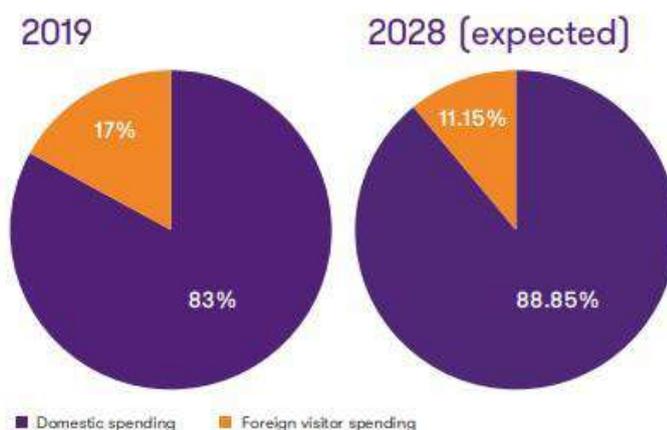
India, with its geographically and culturally vast landscape, attracts travellers for a multitude of reasons - from business to leisure. India is also home to 38 UNESCO World Heritage sites.

The government's efforts to focus on tourism is yielding results; India recorded over 10.8 million foreign tourist arrivals into the country in 2019, a 3.2% year-over-year growth, and accounted for approximately USD 29.9 billion in foreign exchange earnings. Growing at a rate higher than the global travel and tourism industry (3.5%), at 4.9%, India's travel and tourism industry contributed USD 194 billion to the Indian economy in 2019 which helped it gain 10th spot globally, in terms of contribution of the to the global industry GDP. The Indian travel and tourism industry was expected to witness an annual growth rate of 6.9% during 2019-2028 to reach USD 460 billion, approximately 9.9% of India's GDP in 2028.

Increased domestic travel and spends

Domestic travellers drove the travel and tourism sector in India in 2019; domestic spend in the sector stood at 83%. This share was expected to reach 89% by 2028, driven by an increase in disposable incomes and more leisure time at hand.

Contribution to T&T GDP by domestic and foreign travellers

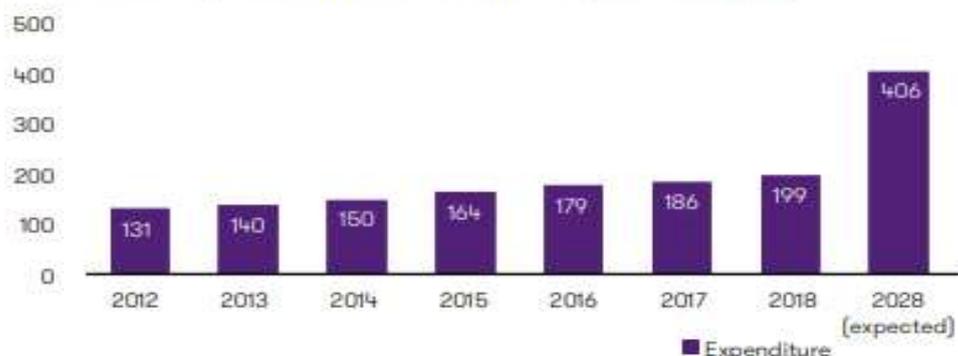


Source: FICCI report published in March 2021

The growth in spends on domestic tourism from USD 131 billion in 2012 to approximately USD 200 billion in 2018 was expected to double to approximately USD 406 billion by 2028, implying a CAGR of 7.3% between 2012 and 2028.

Growth in domestic expenditure

Domestic expenditure on tourism (USD billions)

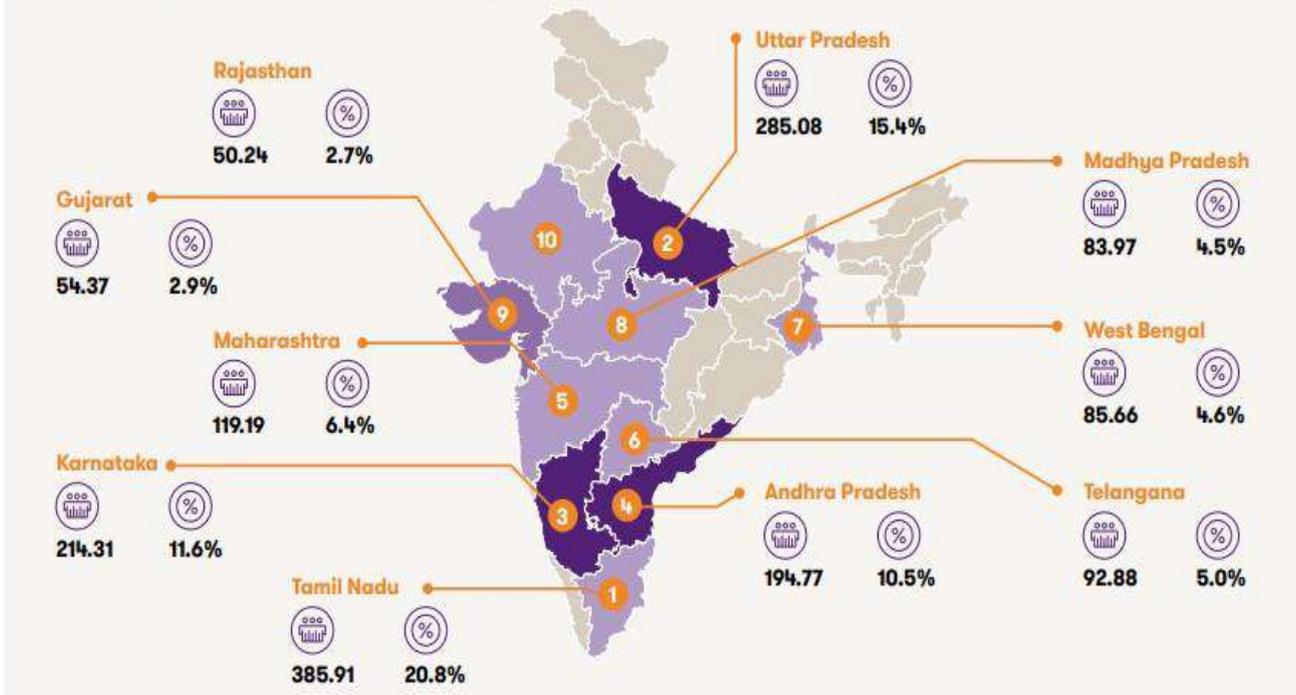


Source: FICCI report published in March 2021

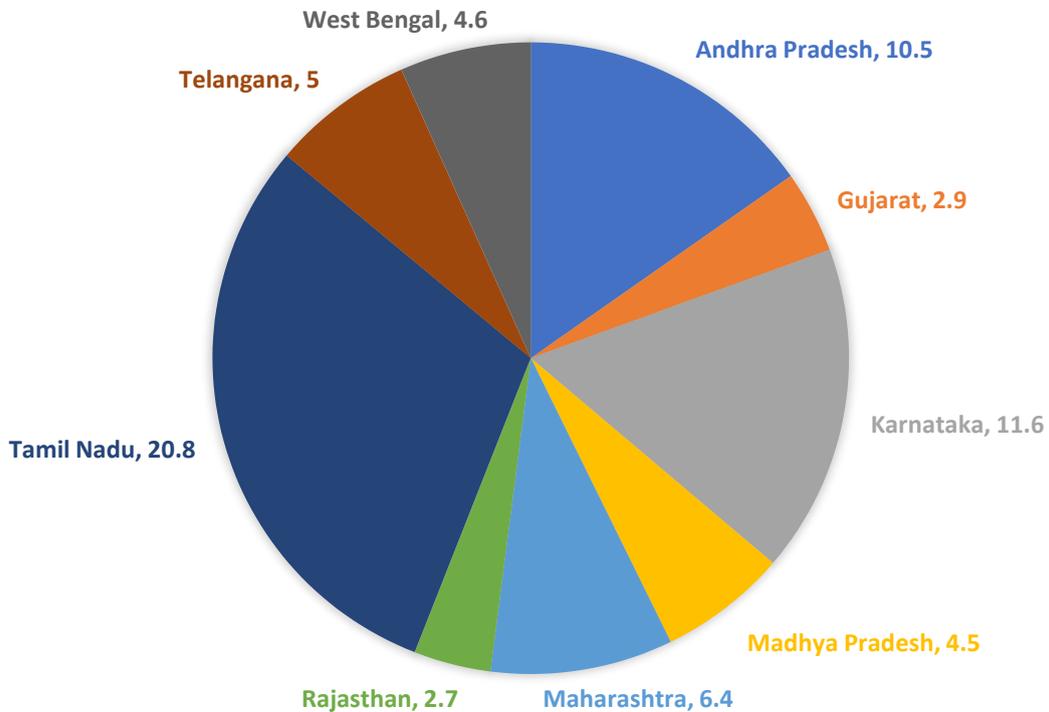
India's top domestic travel destinations

The contribution of domestic travel to Indian travel and tourism sector has been unparalleled for the last two decades, growing almost nine-folds. In a bid to accelerate the growth momentum, the central government and various state governments have made consistent investments into various tourist hubs across the nation. In 2018, Tamil Nadu secured the pole position with the largest share of domestic travellers (386 million people) visiting the state accounting for 20.8% of total domestic travel. This was a year-over-year increase of 11.84% from 2017. Uttar Pradesh and Karnataka were next with approximately 285 million and 214 million visitors, respectively. Uttar Pradesh was the largest gainer year-over-year, growing total domestic visitors by over 21% as compared with 2017. Although Gujarat captured only 2.9% of the domestic tourist market, the state witnessed a huge increase of 12.5% over 2017, owing to the inauguration of the Statue of Unity in 2018 resulting in a revenue of USD 11.8 million. Andhra Pradesh gained a steady increase in domestic travellers too, accounting for approximately 18% in 2017. This increase can be attributed to religious tourism, better air connectivity and tourist facilities provided by the state government. The state also has many heritage sites, which attract not only international but domestic tourists too. While other states have increased their yearly domestic visit figures in double digits, states, such as Telangana, West Bengal, Madhya Pradesh and Rajasthan, showed single digit year-over-year growth of 9%, 7.5%, 7.6% and 9.4%, respectively.

Top 10 Indian states in domestic tourist footfall (in million)



TOP 10 INDIAN STATES IN DOMESTIC TOURIST FOOTFALL (IN %)



(The former figure was used as data reference for the pie chart)

Schemes by the Government of India to boost Travel and Tourism

1. Incredible India

Incredible India (styled as Incredible !ndia) is the name of an international tourism campaign maintained by the Government of India since 2002, to promote tourism in India. The "Incredible India" title was officially branded and promoted since 2002.

According to spending data released by Visa Asia Pacific in March 2006, India has emerged as the fastest growing market in the Asia-Pacific region in terms of international tourist spending. The data revealed that international tourists spent US\$372 million in India in the fourth quarter (October–December) of 2005, 25% more than in the fourth quarter of 2004. The tourist spending figures for India would have satisfied the Indian tourism ministry, which had been targeting the high-end market through its long running Incredible India communication campaign.



2. Swadesh Darshan Scheme

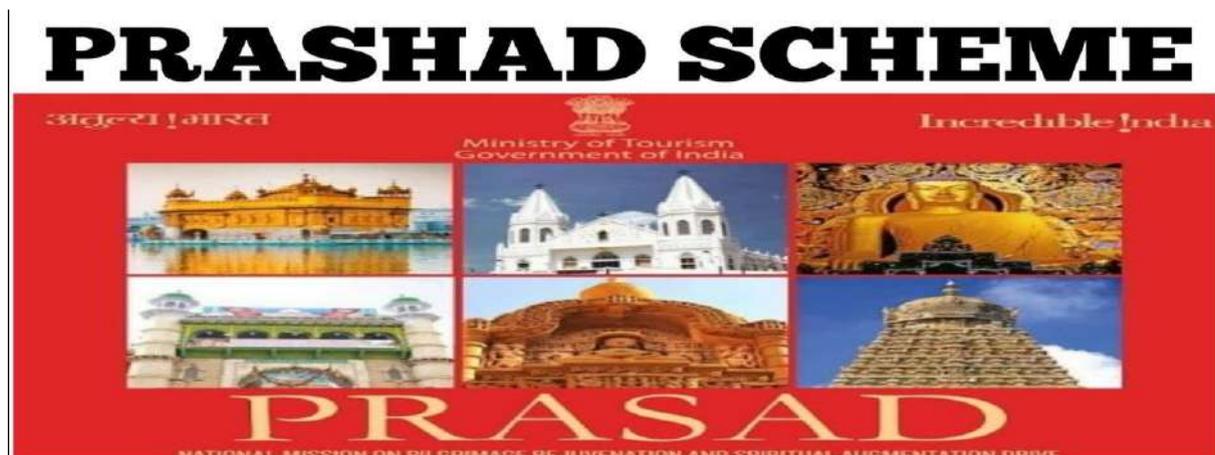
Swadesh Darshan Scheme (Hindi: स्वदेश दर्शन योजना) is a scheme of Ministry of Tourism under Government of India. The scheme aims to promote, develop and harness the potential of tourism in India. It was launched in the year 2015 by our prime minister Shri Narendra Modi. This is a central sector scheme; i.e.

- 100% funded by Central Government of India. Also, efforts are made to achieve convergence with other schemes of Central and State Governments. The funding available for Corporate Social Responsibility (CSR) initiatives of Central Public Sector Undertakings and Corporate Sector is also used in this scheme.



3. Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive (PRASHAD)

The 'National Mission on Pilgrimage Rejuvenation and Spiritual, Heritage Augmentation Drive' (PRASHAD) was launched by the Ministry of Tourism in the year 2014-15 with the objective of integrated development of identified pilgrimage and heritage destinations. The scheme aimed at infrastructure development such as entry points (Road, Rail and Water Transport), last mile connectivity, basic tourism facilities like Information Centres, ATM/ Money exchange, eco-friendly modes of transport, area Lighting and illumination with renewable sources of energy, parking, drinking water, toilets etc. exchange, eco-friendly modes of transport, area Lighting and illumination with renewable sources of energy, parking, drinking water, toilets etc.



4. Adopt a Heritage

This scheme was launched on World Tourism Day i.e., 27th September, 2017. This project is a key initiative of Ministry of Tourism in close collaboration with Ministry of Culture and Archaeological Survey of India (ASI), to develop the heritage sites/monuments making them tourist-friendly to enhance the tourism

potential and their cultural importance in a planned and phased manner. The project plans to entrust the heritage sites/monuments and other tourist sites to private sector companies, public sector companies and individuals for the development of tourist amenities. Adopt a Heritage project is meant to address the challenges that the Archaeological Survey of India and other government bodies are facing in operating tourism infrastructure at heritage sites.



ROLE OF INDIAN GOVERNMENT MINISTRIES FOR BOOSTING THE SECTOR (PRE-COVID-19)

The government has been consistently providing support to the travel and tourism industry. The Ministry of Tourism formulates all national policies and programmes to aid and promote tourism in the country. In the last five years, the Ministry of Tourism has undertaken several initiatives to boost the sector. Other ministries, such as Ministry of Civil Aviation, Ministry of Railways, Ministry of Road Transport, work alongside the Ministry of Tourism.

Key initiatives to enable the sector's growth by Government of India's Ministries include:

Ministry of Tourism

- E-Visa extended to 169 countries
- Incredible India 2.0 campaign focusing on niche tourism in order to promote

- Dekho Apna Desh campaign to incentivise frequent domestic travel within one year
- 100% FDI under automatic route for travel and tourism-related activities, including hotel construction projects
- USD 983 million sanctioned for PRASHAD and Swadesh Darshan schemes
- Key focus on promoting North Eastern states as well as Jammu and Kashmir in the National Tourism Policy
- Generating adequate manpower and developing necessary skills by providing training and professional education at institutes across the country
- Toll-free, 24x7 helpline for tourists in 12 languages

Ministry of Civil Aviation

- Regional connectivity scheme UDAN (Ude Desh Ka Aam Nagrik) to make flights available at affordable prices through concessions by central and state governments as well as airport operators to improve connectivity. 8 out of 46 proposed routes have been operationalised
- Encouraging the use of water aerodromes and helicopters in tourism
- Nabh Nirman: Construction of 19 green-field airports with an investment of over USD 14.3 billion over the next 5 years
- Launch of AirSewa to address customer grievances and disseminate real-time data to enhance travel experience

Ministry of Railways

- 100% FDI in railways infrastructure
- Railway operations made more environmental-friendly with adoption of cleaner technology and afforestation of vacant railway land
- National Rail and Transport Institute to improve the quality of training of railway employees
- Indian Railway Catering and Tourism Corporation (IRCTC) offering specialised train tours catering to various types of travellers

- Agreement between Indian railways and UNESCO to connect all eight state capitals in the North East with countries like Bhutan, Myanmar, Bangladesh and Nepal

Ministry of Shipping

- E-visa facilities at Mumbai, Mormugao, Mangalore, Kochi and Chennai ports have been set-up to ease immigration
- Biometric requirements have been waived off for cruise passengers arriving at the aforementioned five ports with e-visa
- Action plan drafted for development of cruise tourism in India
- Development of 78 lighthouses under PPE
- Modernisation of Indian ports under the Sagarmala project
- Development of river cruise circuits

Ministry of Road Transport and Highways

- 100% FDI in road and highways sector allowed under automatic route
- Launch of Bharatmala Pariyojna to optimise efficiency of freight and passenger movement and improve the quality of 34,800 kms of road, with focus on improving connectivity in the North East
- Development of wayside amenities to provide travel comfort to highway users

Ministry of Culture

- Launched 'Adopt a Heritage' project to engage public and private sector companies as well as individuals to create and maintain state-of-the-art facilities at various heritage sites and monuments
- 100 monuments protected by the Archaeological Survey of India are being developed and maintained under the Adarsh Samarak scheme with the objective of improving tourist experience, especially for the physically challenged

Ministry of Environment, Forest and Climate Change

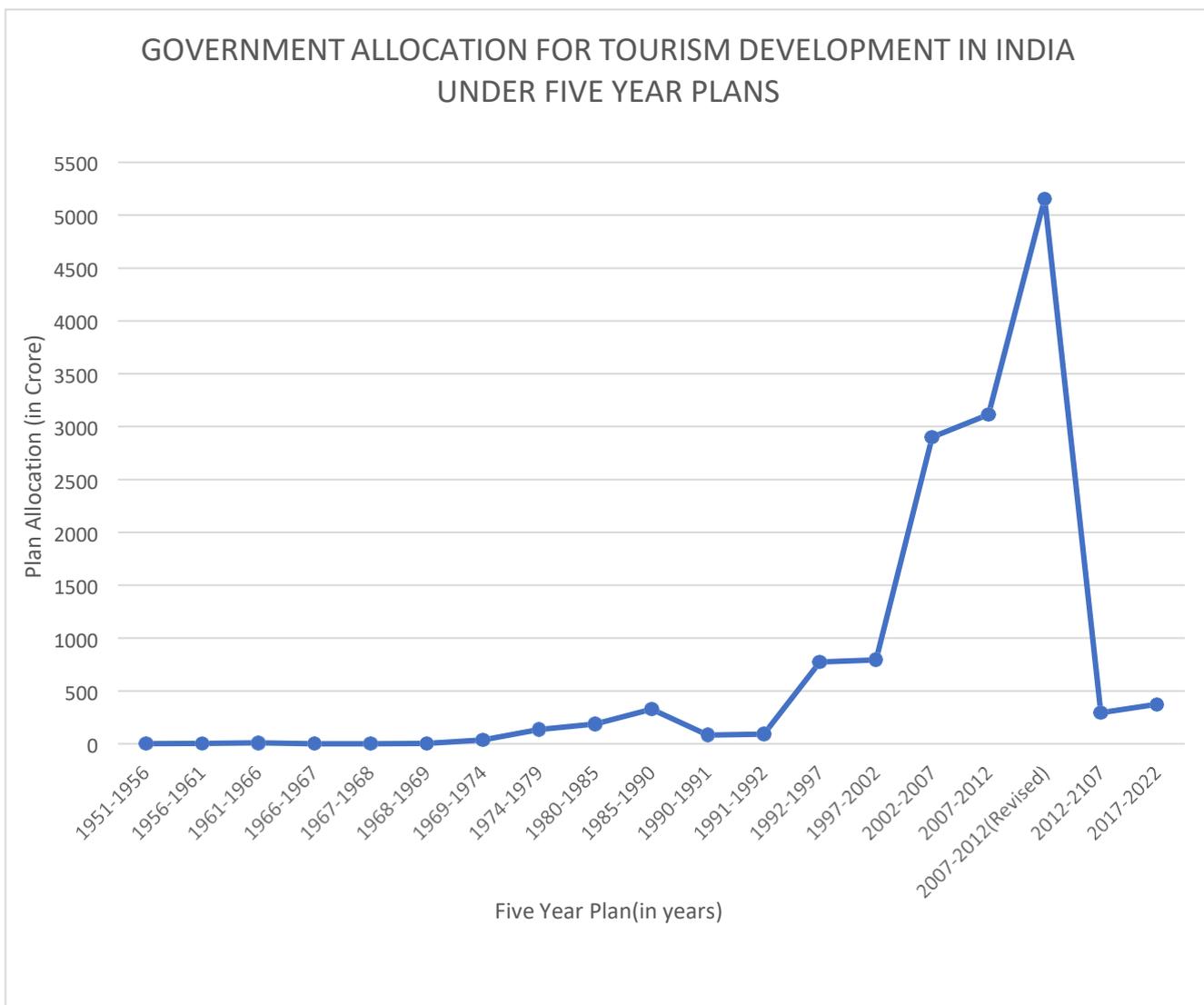
- Collaborated with the Ministry of Tourism to develop policy on niche tourism such as ecotourism and wildlife tourism
- Launch of the National Mission for Green India (GIM) to increase forest cover, density and conserve biodiversity

GOVERNMENT ALLOCATION FOR TOURISM DEVELOPMENT IN INDIA UNDER FIVE YEAR PLANS

Five Year Plan	Time Period	Plan Allocation (in Rs.)
1 st	1951-1956	0
2 nd	1956-1961	3.37
3 rd	1961-1966	8
	1966-1967*	0.59
	1967-1968*	0.88
	1968-1969*	1.84
4 th	1969-1974	36
5 th	1974-1979	133
6 th	1980-1985	187.46
7 th	1985-1990	326.16
	1990-1991	83
	1991-1992	90
8 th	1992-1997	773.62
9 th	1997-2002	793.75
10 th	2002-2007**	2900
11 th	2007- 2012***	3112.71
	Revised****	5156
12 th	2012-2017	293
13 th	2017-2022	372.37

Source: Five Year Plans, Government of India; *Indian Tourism: Economic Planning & Statistics; **Annual Report, 2002-2003, Department of Tourism, Government of India; ***Annual Report, 2011- 2012,

Department of Tourism, Government of India; ****Report of the Working Group on Tourism, 12th Five Year Plan (2012-2017), Ministry of Tourism, Government of India. The value of the 13th Fiver Year Plan is taken from the internet.



Source: FYP of Economic Planning Above Table

IMPACT OF COVID-19 PANDEMIC ON THE TRAVEL AND TOURISM INDUSTRY

COVID-19 has disrupted international travel trade and supply chains in an unprecedented way. Several countries have suspended tourist and business visas and banned both domestic and international air travel, bringing economies to a screeching halt. The International Monetary Fund predicts a shrinkage of the global economy by 3% during 2020 due to the novel coronavirus. With many economies yet to hit their infection apexes, experts predict economies around the world to shrink in the first quarter of 2020, with ripple effects expected to be felt in the following months. The travel and tourism sector is the worst hit. Of all the segments of the hospitality sector, the Meetings, Incentives, Conferences and Exhibitions - popularly known as MICE segment - has been hit the most with major international business events cancelled including Mobile World Congress (MWC), Google I/O, and Facebook's F8 event, leading to huge economic losses.

The pandemic is estimated to have a debilitating impact on the Indian travel and tourism sector, which includes hotels, travel agencies, tour operators, destinations, family entertainment venues, restaurants and air, land and sea transportation, amongst others. Overall, losses are estimated to total up to USD 16.7 billion. Being a large employment generator for the country, 40-50 million jobs will be at risk in 2020, both directly and indirectly employed in the industry. The Ministry of Tourism has constituted a National Tourism Taskforce, to be headed by the Minister of State (I/C) for Tourism to meet the challenges posed by COVID-19 and will include state tourism ministers, joint secretary level officers of the concerned central ministries, and representatives from associations, such as FICCI, CII, ASSOCHAM and WTCII, as well as heads of tourism and hospitality associations. With large scale cancellation of travel plans by both foreign and domestic tourists, there has been a drop in both inbound and outbound tourism of approximately 67% and 52% respectively from January to February as compared with the same period last year. The aviation sector, which contributes 2.4% of Indian GDP, is among the worst affected sectors due to COVID-19. The spread of the pandemic across the country, in the last two months, has led to a 47% decline in the passenger traffic. Following the lockdown in March, airlines have been incurring parking charges as nearly 650 planes of Indian carriers are now grounded. These

airlines are liable to pay a lump sum amount of INR 6 million of parking and housing charges. Airlines are also refraining from increasing prices for the summer season. According to the Centre of Aviation (CAPA), the Indian aviation industry could bear losses up to USD 3.6 billion during April-June 2020 alone.

The travel ban has largely impacted tour operators and travel agencies as the restrictions have not only affected current bookings, but future bookings too. With March and April being peak season for Indian travellers heading to both domestic and international destinations, nearly 90% bookings of hotel and flights have been cancelled for the same period. Among these cancellations are cruise bookings for destinations such as Thailand, Singapore and Malaysia. According to the Indian Association of Tour Operators (IATO), the hotel, aviation and travel sector together may incur losses of about INR 8,500 crore due to travel restrictions imposed on foreign tourists by India which further puts at risk the survival of smaller to medium sized organisations including the jobs of several thousand, if not lakhs of individuals. For tour operators and travel agents across the length and breadth of the country, average losses in revenues compared with the same period last year have been in the range of 50-80%. India has a total of 3961 centrally protected sites either under UNESCO as a world heritage site or the Archaeological Survey of India (ASI). Monuments, such as the Taj Mahal and Agra Fort in Agra and Qutub Minar in New Delhi, are the highest revenue earners grossing annually INR 77 crore, INR 34 crore and INR 26 crore, respectively. The livelihoods of approximately 1.75 lakh daily earners, including tour guides, rickshaw pullers, photographers, etc., have been affected in Agra alone. Tour guides with licenses from the government are not allowed to take up alternative jobs, adding to their challenges. Various pilgrimage sites, including large temples across the country, have been closed in the wake of the pandemic. Tirumala Venkateswara Temple, the richest Hindu temple has incurred losses of nearly INR 125-130 crore so far. Other temples in Tamil Nadu have also incurred losses due to the lack of daily offerings. Closure of pilgrimages has also had cascading effects on hotels, homestays, businesses of travel agents as well as floriculturists. Negative impact on the Indian Railways has also been witnessed ever since the nationwide seizure of rail services across the country. The Indian Railways facilitate the movement of goods as well as passengers. The Indian Railways is expected to witness losses amounting to INR 17 billion due to COVID-19; almost 13,000 passenger trains have come to a standstill.

TOURIST INFLOW IN INDIA

After the onset of the coronavirus outbreak, the foreign tourist inflow to India started declining. A brief scenario and comparison between the tourist's arrival in 2019 and 2022 are illustrated below.

DOMESTIC TOURIST ARRIVAL (DTV) AND FOREIGN TOURIST VISTIS (FTV) DURING 2020 & 2021

S. No.	STATES/UNION TERRITORIES	2020		2021		GROWTH	RATE
		DOMESTIC	FOREIGN	DOMESTIC	FOREIGN	DTV (%) 2020/2019	FTV (%) 2020/2019
1	Andaman & Nicobar Islands	505398	16206	191207	5412	-62.17	-66.60
2	Andhra Pradesh	237051508	280356	70828590	67591	-70.12	-75.89
3	Arunachal Pradesh	555639	7825	42871	961	-92.28	-87.72
4	Assam	5447805	26878	1266898	7285	-76.74	-72.90
5	Bihar	33990038	1093141	5638024	308080	-83.41	-71.82
6	Chandigarh	1563795	44132	417953	12218	-73.27	-72.31
7	Chhattisgarh	17304506	6817	2810227	2322	-83.76	-65.94
8	Dadra and Nagar Haveli	618330	1666	104959	222	-83.03	-86.67
9	Daman and Diu	897804	5703	297436	1382	-66.87	-75.77
10	Delhi	36467598	2983436	9583671	681230	-73.7	-77.20
11	Goa	7127287	937113	3258715	302751	-54.28	-67.69
12	Gujarat	58864661	595607	19464517	210047	-66.93	-64.73
13	Haryana	4549017	48046	2114731	17474	-53.51	-63.63
14	Himachal Pradesh	16829231	382876	3170714	42665	-81.18	-88.86
15	Jharkhand	35580768	176043	2574704	490	-92.76	-99.72
16	J&K	16163330	57920	2519524	5317	-84.41	-90.82
17	Karnataka	227934714	608754	77453339	165325	-66.02	-72.84
18	Kerala	18384233	1189771	4988972	340755	-72.86	-71.36
19	Lakshadweep	6985	820	3462	413	-50.44	-49.63
20	Ladakh	241285	38652	6743	1126	-97.21	-97.09
21	Madhya Pradesh	88707139	327958	23519632	99819	-73.49	-69.56
22	Maharashtra	149294703	5528704	39234591	1262409	-73.70	-77.20
23	Manipur	167560	13608	49669	3139	-70.36	-76.93
24	Meghalaya	1245633	25813	24734	2311	-98.01	-91.05
25	Mizoram	163762	2249	30890	265	-81.14	-88.22
26	Nagaland	125949	5577	10979	518	-91.28	-90.71
27	Odisha	15307637	115128	4622273	10206	-69.80	-91.14
28	Puducherry	1713248	149919	1114942	92080	-34.92	-38.58
29	Punjab	47385387	1101343	16692197	359114	-64.77	-67.39
30	Rajasthan	52220431	1605560	15117239	446457	-71.05	-72.19

31	Sikkim	1421823	133388	316408	19935	-77.75	-85.05
32	Tamil Nadu	494865257	6866327	140651241	1228323	-71.58	-82.11
33	Telangana	83035894	323326	39997001	46694	-51.83	-85.56
34	Tripura	437201	154405	127815	31877	-70.77	-79.35
35	Uttar Pradesh	535855162	4745181	86122293	890932	-83.93	-81.22
36	Uttarakhand	37585920	152273	7005264	41339	-81.36	-72.85
37	West Bengal	92366025	1656145	28841732	463285	-68.77	-72.03
	TOTAL	2321982663	31408666	610216157	7171769	-73.7	-77.2

ABOUT FICCI

Established in 1927, FICCI is the largest and oldest apex business organisation in India. Its history is closely interwoven with India's struggle for independence, its industrialisation, and its emergence as one of the most rapidly growing global economies. A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 2,50,000 companies. FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.

RELIEF MEASURES AND RECOMMENDATIONS BY FICCI TO THE GOVERNMENT OF INDIA

With coronavirus impacting the Indian economy, the travel and tourism industry is looking at up to 50 million jobs at risk. For the industry to tide over this crisis, several relief measures have been recommended to the Government of India by FICCI.

There is an urgent need to take immediate steps to not only contain the spread of the virus but also to address the key pain areas of the industry to minimise the impact of the outbreak on the Indian economy and businesses. A

combination of monetary, fiscal and financial market measures is needed to help the businesses and people cope with the crisis. Therefore, to be able to frame correct actions and policy measures, it is important to understand clearly the specific problems that people and businesses are currently facing. This alone can enable the government to take appropriate measures.

Measures recommended for the survival and revival of the travel and tourism sector

- While a six-month moratorium has been granted to the industry, a minimum 12-month moratorium period is needed on all working capital, principal, interest payments, loans and overdrafts. Collateral and interest-free loans for five years for SMEs in the sector to help them sustain and rebuild
- A 12-month waiver of all statutory dues with respect to license fees, property tax and excise fees
- Defer GST and advance tax payments at the Central Government level and removal of fees for any upcoming licenses, permits and their renewal
- Bailout packages to fund and support salaries in the sector
- Export status for foreign exchange earnings for inbound tours and hotels
- A 12-month deferment in the increase of insurance premium related to standard fire and special perils rate for fire, loss of profits
- SGST to be waived off till the situation becomes normal
- Tax rebates by the government for encouraging spending on domestic holidays (for example, LTA) and GST relief and other incentives for corporates to organise meetings, incentives, conferences and exhibitions (MICE) within the country.

Regulatory measures

- Permit one-time rescheduling of principal/interest dues in line with the estimated cash flows of each project post recovery from COVID-19 without treating it as restructuring, re-classification/downgrading in asset qualification and requirement of additional provisioning
- Permit sanctioning of additional facilities in the form of working capital term loan for meeting cash flow mismatches during the period affected by COVID-19. The tenure of such facility shall be assessed based on the individual project cash flows. Such additional facilities to be treated as standard assets
- In case of projects under implementation, the banks/ institutions/NBFCs be permitted to extend the Date of Commencement of Commercial Operations (DCCO) by one year without treating it as restructuring as it would be difficult for promoters to raise funds from other business/ services for project completion.
- Lending to tourism sector to be treated as 'priority sector lending' at least for next one year which will enable access to bank finance
- Amendments to Master Direction -Reserve Bank of India (Relief Measures by banks in areas affected by Natural Calamities) 2018-SCBs to include:
 - COVID-19 in the definition of natural calamity and permit use of this circular for tourism sector
 - Enabling NBFCs to use this circular (presently only applicable to banks)
 - Removing additional provisioning requirement for the restructured portion of loans under this scheme

Policy measures

- Stimulus package to be formed to stabilise and support the sector in the near-term, including a workforce support fund to ensure that there are no job losses
- Waiver of all statutory dues such as advance tax, custom duties, excise duties, etc. at central and state level for 12 months

- Provision of a 12-month corporate tax holiday to travel, tourism and hospitality sector and deferment of payment of all statutory dues, such as custom duties, excise duties, PF and bank charges, at central and state level for 12 months
- Extension of annual renewal of licenses paid for in 2020 until the end of 2021 without any incremental fee or charges
- Advise credit rating agencies to maintain last-assigned ratings over the next six to nine months due to the expected volatility of the business in the short- to medium-term
- Extension of subsidies on Heat-Light-Power (HLP) costs, as HLP is among the largest fixed cost for the sector
- Waiver/reduction of GST on products offered by the sector for one-year period
- Provision of soft loans/interest subventions/cash
- Incentive/interest subsidies to ensure continuity in business operations
- RBI should re-look at the Foreign Exchange and Management Act with respect to Indian travel companies such that they may be able to source and service customers who are not based in India for services in third-party countries. This may allow forex remittance into India to increase, as margins will reside here, and allow Indian companies to expand to a bigger base

Relief measures requested for the aviation sector

- Immediate direct cash support to Indian carriers for them to meet their fixed costs at least for the period where loss of revenues and liquidity is directly attributable to the Government's directive to cease operation without any reference to the airlines' cash reserves
- Minimum 20% contribution towards the total salary bill of employees with a gross salary of INR 30,000 or less per month, currently employed in airlines carrying out maintenance and repair work
- 100% waiver of parking and housing charges for the duration of COVID-19 for a minimum of 6 months
- Minimum six-month deferment of EMI on term loans
- Provide complete tax waiver, not deferment, for two years

- Soft term loans with 0% interest to meet fixed expenses (salary, wages, utility, maintenance etc), equivalent to 12 months requirement, repayable with a minimum moratorium time.
- Request for AAI to release Bank Guarantees from all RCS UDAN operators. The amount can ensure cash flow for 2 months
- Provide a 12-month moratorium for payments by airlines, MROs and other agencies to hanger or factory premises. The deferred amount may be recovered over a period of 24 months, after 12 months, without any interest on overdues
- Recommendation to consider deferment of payment of GST for the airline industry as airline GST refunds are higher than the GST due.

Relief measures requested for tour operators

- Restoration of Service Exports from India Scheme (SEIS) scrips for duty credit of 10% to the tourism industry.
- Extension of Services Export Promotion Council (SEPC) membership to 31st march 2021
- Finalisation of an aggressive Incredible India marketing plan during lockdown and implementation on opening to drive domestic travel in India
- Approval of completed forms by Directorate General of Foreign Trade within 30 days to utilise the cash flow to pay salaries and expenses
- No landing fees for Goa, i.e., charters land for free to encourage flights to come back
- Same ticket prices for foreigners and Indians for entry to historical monuments

Relief measures requested for online travel agents

- Short-term, interest-free or low interest loans for rebuilding businesses and immediate transmission to all independent travel agents, tour operators and online businesses in the form of term loans and working capital loans. Besides, existing overdraft limits can be doubled for the industry and immediate cash relief to be provided to avoid mass layoffs

- For the revival of travel agencies, a GST holiday for tour packages and all reservation services rendered by travel agents in line with the tax holiday requested for civil aviation and hospitality sectors
- Tax Collected at Source (TCS) exemption for online travel aggregators (OTA) in line with the GST holiday. OTAs are liable to collect TCS at 1% under GST while remitting payments to airlines and hotels. Estimated TCS liability for the entire OTA sector would be INR 460 crore
- Union Budget 2020 proposed a new TDS levy similar to TCS under the GST law, whereby OTAs are required to withhold 1-5% TDS while remitting payments to airlines, hotels etc. Considering how the industry is heading towards a loss year, the proposed provision should be rolled back
- The proposed TCS on sale of overseas packages in the Finance Bill 2020 can harm the tourism business in India. The proposed TCS will not only increase the cost of packages sold by Indian tour operators, it will also shift all sales of outbound tourism to overseas suppliers, denying the government of all Income tax and GST revenues. Therefore, in order to allow domestic tour operators a level playing field and a chance to revive their businesses, it is recommended that proposed TCS should be rolled back
- Payments of other statutory liabilities by travels agencies which should be deferred are:
 - TDS under income tax including salary TDS: INR 1,570 crore
 - PF and ESI deposit including employee contribution: INR 446 crore

Relief measures requested for travel agents

- Support fund majorly for salaries and establishment costs through the following:
 - Government to contribute 33.33% of take-home salaries to all employees of registered travel agencies.
 - Government to use funds of ESIC to pay salaries of employees covered under the scheme.
 - No deduction of TDS on salaries for employees of the trade till March 2021

– Subsidise electricity by 33.33% to give relief to 53,000+ travel agents, more than 1.3 lakhs tour operators (domestic, inbound, adventure, cruise and outbound), more than 2,700 MICE organisers and 19 lakhs plus tourist transporters

- PF contribution to be waived off for all categories of employees for the next 12 months

- Employees to be allowed to withdraw a fixed sum of INR 10,000 for up to six months from their EPF accounts

- ESI contribution to be deferred for 12 months. The insurance corpus of ESI needs to be used now to provide wages to all organised workers for all accumulated days from non-availability of work and the act needs to be amended immediately

- Professional tax to be waived for all companies as well as employees up to March 2021

- Refunds of cancellations and advances of travel agents and tour operators from AIRLINES/IATA: MOT and MOCA immediately advises them to refund. Advances/float accounts also to be refunded in full immediately as they are of money in float/advances for not issued tickets

- Billing period for IATA carriers to be extended to 15 days. MOCA should underwrite these payments to travel agents & tour operators which will be securitised against these receivables from IATA and low-cost carriers/non-IATA airline

- Complete GST and income tax holiday for tourism, travel and hospitality industry for period of twelve months:

- IT Holiday effective FY2019-20

- Reseller model for air travel agents to be permitted for corporates/customers with GST number with the agents directly on payment basis since airlines don't pay on payment/receipt basis and credit GST only on flown basis

- Unlock inter-head credit of GST across IGST, CGST, SGST for tour operators. Permanently allow tour operators to claim IGST for hotel reservations/other services interstate basis as input credit to claim ITC

- Roll back of TCS introduced in Budget 2020 by the finance minister

– LTA like tax benefit for Indians for two times a year for domestic and international travel. This will stimulate domestic travel by Indians

Relief measures requested for hotels

- GST rates on companies in hospitality should be slashed for at least two to three years. Currently, large hotels are charged a GST rate between 12-18% based on room rate. Now that hotels are almost empty, the GST rate should be brought down to 5-6% with immediate effect
- 500 units of electricity per month and water to be provided free of charge to companies in the sector. Thereafter, subsidised rates can apply on actual consumption and not against fixed load
- Export Promotion Capital Goods (EPCG) scheme to consider grant of extension in export obligation fulfilment period by an additional three years (beyond current limit of six years) for all the licenses expiring during current and within this and the next financial year, without attracting any penalty or interest
- Special package for the survival of heritage hotels
- The CSR initiatives for hotels, aviation, travel, tourism entities should be extended to Swachh Bharat, which in the case of tourism industry, should include monuments, tourist sites, and other facilities

Relief measures requested for amusement parks

- Employee State Insurance Corporation to pay the entire wages of the employees of units covered under ESI for the lockdown period. ESI is justified in meeting this commitment of employees as COVID-19 is a medical disaster
- Waiver on custom duties on import of spare parts to bring down the repair and maintenance cost
- Reduction of effective rate of interest on loans from financial institutions by 200 basis points in effective interest rate being charged by financial institutions on term loans, working facilities and other facilities with immediate full transmission for working capital. This will reduce the burden on cash outflow

- Support fund for 12 months on the lines of Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) to support basic salaries with direct transfers to affected employees in the amusement park industry
- Provision of water and electricity to the amusement park industry for 6 months on concessional and subsidised rates
- Waiver of minimum/fixed cost charges levied by electricity department (as exempted for industries by the state of Maharashtra, Gujarat, Uttar Pradesh, and Punjab)
- Waive off property tax/non-agriculture tax/gram panchayat tax of amusement park/water park/theme park as it is developed across huge land parcels for a period of 12 months
- Lower rate of income tax and early settlement of income tax refunds to enhance cash inflow and to reduce cash outflow
- Extend all existing licenses without charges for one year
- To make the entry prices economical to attract patrons, complete holiday for 12 months (central and state level)

Relief measures requested for the ground transport industry

Assistance to tourist bus owners/ operators

- The business of the tourist bus services is severely affected due to COVID 19. The bus owners should be supported by the government monetarily, to ensure their survival. Additionally, the opportunity of increasing inter-state pilgrimage tourism is large at this point where new routes and circuits can be encouraged
- The government should also look to host the inventory of state transport buses in addition to privately owned and operated bus tours on a digital booking and payment platform to increase accessibility as well as reduce crowding at ticket windows at bus stations

Assistance to taxi service providers

As of 2020, there are 1.6 million registered cabs/tourists' cars in India. Of the 1.6 million cabs, 1.3 million are driver owned that have a huge lump-sum to repay via EMI for cars, carrying a cumulative debt burden of around INR 80,000

crores. COVID-19 is going to discourage development of the car model in India, given the liquidity crunch. Government needs to support the cab companies, who run and market these cars to ensure their retention as well as to promote domestic fixed circuits.

-Allow flexibility in commercial/taxi registration permit conditions

Registrations are currently categorized into local point to point movement/ inter-city travel/self-drive rentals. The government should allow for flexibility such that the owner of the vehicle has the option of servicing different use cases, rather than the permit it holds. It will help in his being able to earn a living and fulfil their commitments to the bank in terms of the EMI.

-Allow private cars to be rented on self-drive basis

Owners of private cars can earn their living and supplement the cost of owning a private car through renting them on self-drive basis. This may require taking appropriate insurance cover but can help in the development of self-driving in India.

Opportunities For Growth in the Sector

Promote niche travel products under the Incredible India 2.0 campaign

- **Yoga and Ayurveda** - Promote wellness tourism as a key unique selling product which will gain a lot of attraction in the near future
- **Religious circuits** - Religious circuits is a highly unorganised travel market. A complete relook is required to formalise these offerings into circuits for all faiths. Even the NRI market can be tapped for this product, if institutionalised well. Government needs to play a unification role with state, private players, travel operators and other identified points of sale, including fin-tech companies. A feasibility study should be conducted to connect the religious sites by modes of transport such as aerial ropeway and trollies. Rail, bus, and IRCTC need to all work in cohesion for the circuits to be a success
- **Culinary tourism** - It is a great opportunity to explore variety of cuisines in the country. Focus on creating culinary circuits and trails and promote it extensively through digital campaigns. Promote local food by partnering with online restaurant aggregators for showcasing dining in experiences of cafes/restaurants

- **Self-drive holidays** - Self-drive holidays, including hiring of self-driven cars need a complete re-look in the Indian market. Currently, only 10,000 self-driven commercial vehicles are registered in 30 cities across India. The base should be expanded to include a larger number of railways, airports and city gate ways. This will attract younger population who could combine their air/rail travel with self-driven cars. The self-driven cars should have an in-built application for navigation and facilities for the traveller/driver
- **Caravan tourism** - It should be promoted for road trip holidays as it will give a unique experience to visit many destinations while limiting contact with others. Government should come up with caravan circuits and identified camping spots. These camping spots should have the infrastructure for waste management and other basic services such as water and food. Petrol pumps on the highways can also expand their services for caravans to provide waste management and other basic services including cooking fuel. They can also provide parking space on a chargeable basis for overnight halts with CCTV for additional security.
- **Film industry** - Government must encourage film makers to shoot at Indian locales in order to showcase India further to both domestic and foreign markets and subsequently create demand. India should have a single window clearance for all shoots to reduce delay and uncertainties. India should also provide a cash rebate to reduce cost of shootings as movie shoots are a medium to increase footfalls across the country.

Promote the corporate travel segment

Online travel companies and travel management companies in India must develop technology platforms to aid and develop the corporate hotel segment. This would ensure bookings and payments are made from India thus allowing revenues to sit in India rather than overseas as currently payments are made either by overseas associates or out of the per diem foreign exchange allowance for the traveller.

Current trends and patterns indicate bookings and payments are made by the traveller overseas, which can be brought in-house by the companies. Not only will it increase their penetration but will also contribute to government through GST collections.

Create a more conducive business environment

The government should re-visit their regulations, taxation and other norms to increase ease of doing business in India. Organisations are choosing to register their companies abroad citing stable regulations, subsidised tax rates and increased global investor interest as reasons. The Indian government should look at adopting foreign best-practices to ensure maximum Indian companies register in the country. With a foot in the door through large Indian technology firms already servicing global customers, this can be extended to the travel and tourism sector also.

Assistance to accommodation providers

Develop public-private-partnerships (PPP) for rating of hotels and other accommodation facilities to increase efficiency of said ratings spanning the entire nation using international benchmarking criterion recognised by domestic and foreign travellers alike. Current rating standards are inefficient and biased to a large extent and due to the COVID-19 outbreak due importance will need to be given to health and safety ratings as travellers will be more aware and finicky about where they stay while on holiday.

Development of digital content

Digital content must be made available to potential travellers. This includes content about the destination, activities, experiences, dining, hotels, mode of travel etc. Currently, digital content is difficult to find, and held by foreign private companies like Lonely Planet which increases the cost.

Digital content should be holistically facilitated by the government in a PPP model uniformly and made accessible to tourists as well as domestic and inbound tour operators. Digital content needs to come in an integrated manner through API/ web services so that tour operators, OTA, can use it for their customers in a holistic manner. The content is recommended to be in English as well as Hindi, Gujarati, Tamil, Telugu and Bengali to cater to all kind of travellers. The key focus should be on making India become an “Internet bookable” destination by fostering investments in this direction.

Investment in emerging technology and local skill development

- **Artificial intelligence and machine learning** - Study possible uses of emerging technologies, such as artificial intelligence, machine learning and virtual reality, in the travel and tourism sector in handling queries, providing more information to potential travellers, as well as saving business costs. Making the same available via PPP arrangements to the larger market rather than the handful who can afford it. Institutes under the Ministry of Tourism should add AI to the syllabus not only to educate students and professionals alike on the subject but to aid innovation. Private tour operators should be guided by the government and educated about the role artificial intelligence can play
- **Big data** - Government of India should invest in utilising Big Data via PPP arrangement as a means of identifying India's unique proposition across various points in a customer journey. This would include the study of all possible touchpoints from booking at source to airline/GDS bookings, hotels, car rental services and many others to increase customer experience, allowing entities within the sector to do the necessary value add to attract more travellers.

Guidance for companies in the travel and tourism sector

Airlines

- Stricter audit of compliance to rules, regulations and SOPs for operation, maintenance and other related activities to ensure safety of passengers and crew post lockdown.
- Temperature screening of passengers and crew, regular sanitisation and fumigation of terminals and disinfection of airplanes should be implemented
- Food vendors for airlines should follow extremely high quality and hygiene standards. If possible, on-board meals can be discontinued on short haul flights for the duration of a few months
- Hand sanitisers should be readily available on all aircrafts, and one or more universal precaution kits should be provided to protect the crew
- Passengers boarding and de-boarding the aircraft should be made to sanitise thoroughly, with temperature checks being conducted at both times

- Airlines should start operations by determining the optimal size of their networks and fleet and which routes to start first, based on demand
- Airlines can consider M&A opportunities including divestitures or the sale and purchase of minority equity stakes
- Instead of firing staff, airlines can reduce payroll profits for top level executives
- Instead of reducing the crew fleet size, the duration of flight hours worked per member can be reduced and distributed to a larger number of the workforce
- A project management team should be created to manage cash until operations start returning to pre-crisis levels. Airlines should also focus on a digital and data-driven approach

Tour operators and travel agents

- Creating holidays with farmers and rural India. A positive push is required to co-create holidays with farmers and rural India, which will help in wealth creation and distribution
- Come up with standardised guidelines for tour operators, on ground service providers, monuments etc. and work on a health certification model with frequent checks
- Operators should re-look at monuments and associated infrastructure such as toilets, steps, slopes to see how they can be made user friendly, especially for the differently abled, have railings for the elderly, etc.
- There would need to be a continuous monitoring of assets and properties through an app, so that the tourists have a proof of safety and hygiene before they enter a property
 - They need to focus on all touch points such as transfer cars, luggage, laundry etc. and work on creating a contactless experience

Hotels

- **Recognise essential workers**

Companies are recommended to offer special packages to healthcare workers and other essential workers. These packages can be in the form of free or lower cost hotel membership offerings. Some hotels are already providing complimentary rooms and giving their highest tier of membership to these

workers. Hotels can also consider donating food from the hotel restaurants to local hospitals.

- **Invest in hygiene and communicate with clients**

Hotels need to revise their room cleaning protocols. They need to review how medical assistance facilities can be created/improved to assist travellers. Create a new standard operating process of safety and hygiene to maintain cleanliness in the hotel and train the staff to follow it. Identify all possible touchpoints and invest in contactless technologies to ensure that all these touchpoints are automated and interaction with hotel staff is minimised.

- **Encourage future bookings**

Companies are suggested to encourage future and potential customers to consider booking travel packages/ hotel bookings in advance at a reduced rate.

Companies could consider providing a discount on future bookings redeemable up to December 2022.

For e.g., a hotel can offer to provide a 10-day holiday package for 60% of its original sale price. They can offer it as a coupon which can be redeemed by the buyer any time before December 2022.

- **Flexibility instead of refund**

Companies can offer to allow the customer to change their dates of bookings without any cost. Companies could also consider providing a reduced price if a customer chooses to re-book instead of cancelling their bookings.

- **Gift cards/vouchers**

Companies can consider providing a gift card or a voucher with a benefit which can be used by consumers later.

- **Promote skill development for employees**

Companies should focus on upskilling the staff to prepare them for the revival stage. Companies should support the employees by helping them develop new skills for the recovery and growth phase post COVID 19. Companies can also liaise with educational institutes to develop online training courses for your staff.

- **Loan staff arrangement**

For staff less than a certain salary threshold (cleaning staff, maintenance etc.) companies could consider discussing feasibility of loan staff arrangement for the next three months with firms who are in the essential services industry. This could help companies in getting short term reprieve on salary cost, while beefing up personnel in essential services.

- **Vendor management**

After assessing the supplier capability and categorising all operating supplies including perishables in order of importance, the procurement team must ensure proper stock piling.

- **Power and equipment**

Before starting any equipment, a thorough service plan should be made to ensure that all equipment is fully functional and safe. Hotels can also shut down floors with no occupancy, thus helping them save majorly on-air conditioning costs as well as other operational costs.

- **Continuously contact your client base**

Maintain contact with clients through digital marketing campaigns across channels and platforms. Hotels should also try and honour all client reservations and bookings that were cancelled or deferred due to the crisis. The hotels should leverage the opportunity to market the right products through promotional campaigns to cater to the domestic market.

Lodges

- **Compliances**

Lodges need to ensure that they are meeting all revised government and brand norms. They should also continue to follow the health and cleanliness guidelines and reassure guests and employees by intensifying routine maintenance and increasing deep cleaning measures.

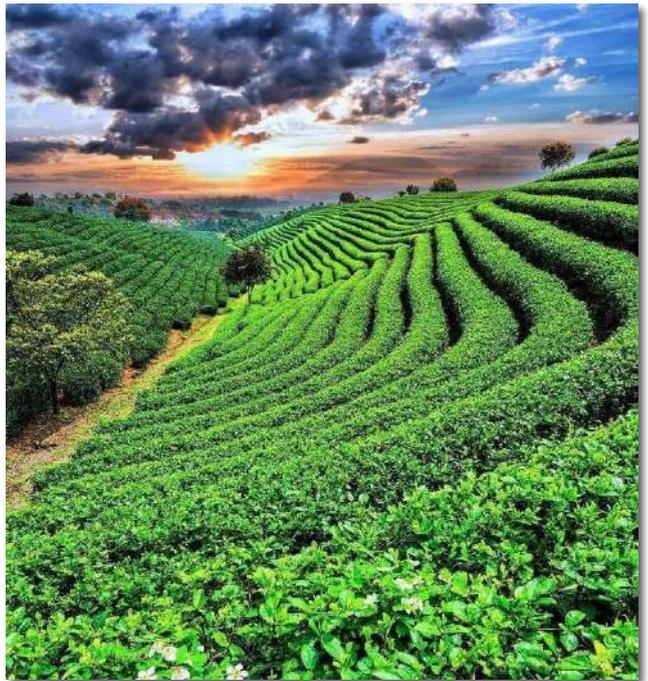
- **Investment in contactless technologies**

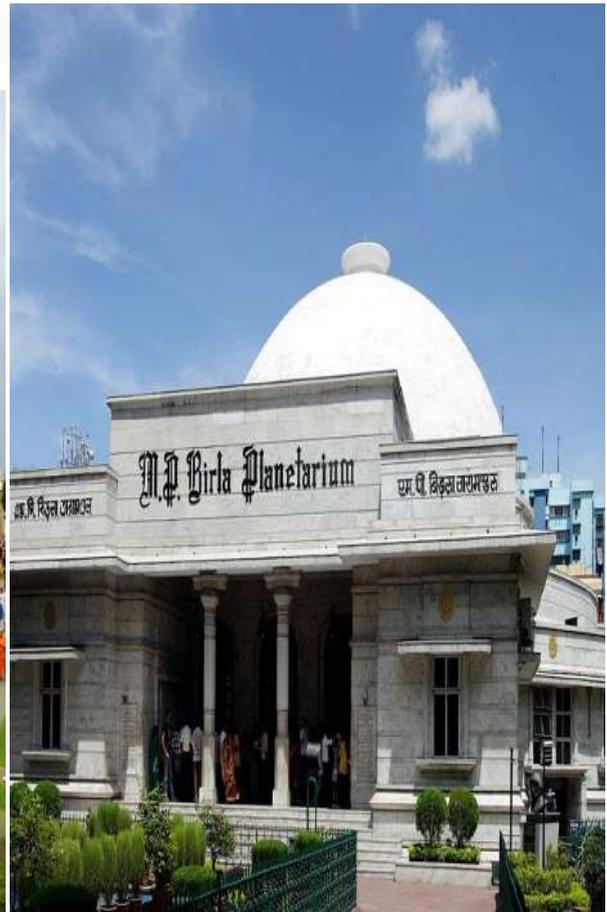
Lodges should accelerate investments in “no touch” technologies such as eye scanners gesture controls and automation to personalise digital interactions while enabling social distancing.

Railways

- The Indian Railway Catering and Tourism Cooperation (IRCTC) should reduce the annual management charges from INR 12 to INR 6 per each ticket. At the same time, OTA's should be encouraged to invest INR 4-5 per ticket for domestic holiday demand creation and improving the experience of rail booking platform. IRCTC should allow private OTAs to advertise to boost domestic demand
- Currently, 10% of the rail tickets are hosted by IRCTC. A feasibility study should be conducted to add the same rail tickets to IRCTC inventory, the rail inventory enhancement will not only also assist towards booking and payment on digital platforms but also reduce government costs for selling.

GALLERY





CONCLUSION

All across the world, countries are looking at tourism as the main driver to revive their economy. The data by World Travel and Tourism Council (WTTC) reveals that in 2019 the tourism industry in India contributed INR 194 billion to India's GDP. The industry also supported 87.5 million jobs, 12.75% of total employment in 2018-19. 9. Due to the impact of the pandemic on the Indian economy, the travel and tourism industry in India is looking at up to 40 million job losses (both direct and indirect) and about USD 17 billion in revenue loss.

This study focuses on the impact of the COVID-19 outbreak on the Indian tourism industry. The outbreak of COVID-19 is a novel pandemic that severely impacted the lifestyle of the majority of people across the globe. The critical economic shock to every person and every industry in most countries is the most common feature of the novel corona virus. COVID-19 has a significant impact on economic growth worldwide and creates an economic recession due to quarantines, travel restrictions, and social distancing. Some of the threats faced by economic environment during pandemic are rising unemployment, world recession, uncertainty weighing on consumer, vaccine unavailability and business confidence. Because of its unique tourism products, India is one among the famous destinations for both domestic and international tourists and travellers. The travel and tourism companies in India dealt a miserable journey due to cancelled bookings from travellers. Uncertain length of pandemic caused Extent of lockdowns which had travel restrictions was the treat mainly faced by tourism industry.

With the enforce on travel bans internationally, the airlines and railways came to a halt. The hotel and travel sector collectively may acquire a loss of about ₹85 billion due to the restrictions forced on travel and tourism. However, domestic transport was started early with some limitations. Some of the big tourism and hospitality organization such as Airbnb, OYO, Vista also faced loss. Most people think that their travel was affected mainly due to the fear rather than pandemic rules, availability of E-pass and availability of seats to travel at the same time the mode of travel considered to be most affected by the people was airline travel. During the lockdown period, India had cancelled travel to over 80 countries, which made the international flights being suspended. Along this, the cancellation of various events, caused a great job loss to many organizers.

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WEST BENGAL STATE UNIVERSITY

Bhairab Ganguly College

Project on

**Socio-economic status and buying pattern during pandemic
period**

SUBMITTED BY

ZINAT KHAN

(STUDENT OF M.COM)

2019-2021

REG.NO.1071922401408

UNDER THE SUPERVISION OF

DR. SURAJIT SENGUPTA

(ASSISTANT PROFESSOR)



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CERTIFICATE

This is to certify that Zinat khan student of Masters of commerce at Bhairab Ganguly College under West Bengal State University has completed the project on "Socio-economic status and buying pattern during pandemic period", under my guidance.

The report has been checked.

Dr. Surajit Sengupta
Assistant Professor
Department of Commerce



CANDIDATE'S DECLARATION

Project

Analyzing the socio-economic status and buying pattern during pandemic period.

I declare

- a) That the work presented is an outcome of my own efforts, and that my debts (for words, data, arguments and ideas) have been appropriately acknowledge.
- b) That the project report has not been previously submitted for any other assessment.

DATE: 08/09/2021

ZINAT KHAN
STUDENT OF M.COM
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1) INTRODUCTION

Coronavirus is a group of viruses that basis minor illness and certain type of virus can infect the lowest airway, and commencing severe illness such as pneumonia, bronchitis. COVID-19 is greatest influential pandemic to destroy public health. As is implied in the name COVID-19, CO for corona, VI stand for virus and D means diseases and 19 represents the year of its occurrence. The worldwide 5,370,375 confirmed cases and 344,454 deaths were registered by the World Health Organization (WHO).

After the COVID outbreak in Wuhan, China, it created a massive loss of life in other countries like Italy, Iran, France, Spain. The coronavirus eruption is first and prime human tragedy across the globe, affecting the lives of millions of people. It has greatly impacted the global economy. Every sphere is affected and impacted by the pandemic. Before lockdown work from home created a positive shift in the trend online shopping. But this could not reside for a long time. Unexpected lockdown of 21 days impacted Indian online shopping and marketing trends drastically

Initially, Coronavirus's influence on consumer buying behavior, towards brands and online tools was largely unknown. This paper aims to reflect on different issues and perspective of online marketing due to COVID-19. There are still many more uncertainties to predict how the sale for the next months will be impacting the global community, both personally as well as professionally. This study explores the impact of the epidemic from toilet tissue rolls to baby gear, grocery, pet food to many more daily essentials. Although some of the companies managed to operate through social commerce that is marketing by using e-commerce and social media.

As the E-commerce industry is growing tremendously during pandemic in the Indian market. The cheap 4G internet packages in India obviously gives a push to these industries. So, as COVID-19 first hit in India, people got scared to go out from their homes because, in their mind, it's a fear of coronavirus. They even hesitate to go out to buy essential goods. Panic

buying also has been seen and to avoid this fear of COVID-19 ,people are giving preferences to the E-commerce sites to buy essential goods and some customers are new which signed up to buy essential goods during this pandemic lockdown period. Many customers are shifting their buying behavior from offline retailers stores to online stores. In this questionnaire collected from 38 respondents, some of them are old customers who used to buy some of their essential goods online and some of them has changed and their buying pattern are changing.

1.1 OBJECTIVE OF THE STUDY

- 1)To measure the impact of socio-economic impact of COVID-19
- 2) Impact of COVID-19 on buying pattern.
- 3) To measure the relative changes in expenditure and its causes.

2) LITERATURE REVIEW

1)Aneesh Reddy, (April,14,2020) Covid-19 impact: Consumers move towards digital

Aneesh Reddy explained that due to the COVID-19 pandemic, the way we work has totally changed, the way we used to shop and communicate with people. People are only going out only to buy essentials items from the retail stores and still worried to go out to buy essentials goods because they are constantly worried about getting infected. Reddy said that according to trifecta, due to a cheaper 4G network and constantly increasing consumer wealth, Indian E-Commerce is expected to grow to



US\$200 billion by 2026. But these projections were based on the pre-covid-19. But as COVID-19 hit India, the surging demand of e-commerce for the past few months is so high that the e-commerce industry could hit \$200 billion much earlier.

2)PTI, (April 24,2020) Majority of Indian consumers may shift to online shopping in the next nine months,

The survey done have estimated that the pandemic breakdown and lockdown are going to bring major changes in how the Indian consumers going to buy goods or their buying behaviour. If essential commodities are talked about, there will be a major shift from 46% to about 64% in online shopping in the next 6-9 months. Also, as compared to 59% of consumers, around 46%of consumers are going to buy from physical stores. A survey conducted showed that nearly 74% of consumers prefer to buy online post the lockdown.

3)Next new desk (April 29,2020) Bengaluru based start-up wagon fly secures \$500k in investment from ITI growth:

Companies like wagon fly which is a contact-free shopping and delivery services start up, has just raised \$500,000funding, where its founder Raghavendra Prasad, has claimed a major shift to take place in the overall operations of the retail stores. As a consequence of this COVID-19 lockdown, consumers are now going to prefer contact-less shopping through online stored or portals and this is to completely change to their buying and consumption behaviour and pattern. The company's venture called cafefly, an online marketplace focuses on meeting the consumer's changing demands for FMCG products who fear to step outr due to the pandemic.

4)Mukherjee. W, Bailay. R, Srivastava. A (March 16,2020) consumer goods flying off the shelves.

Covid-19 lockdown has witnessed a sudden rise in the online sales of consumer goods like groceries through the emerging online platforms like Grofers, big basket, etc ,in the form of panic buying. Various FMCG companies have witnessed a 20-25% rise in the sales of these goods in each category. E-commerce companies like these have stated that they are stocking these goods in advance as compared to the pre-lockdown period



and are seeing this as an opportunity to encourage customers to go online shopping and benefit from the same. And they have allowed the reason to the consumer's concern about social distancing and as a preventive measure against the pandemic.

5) PTI (April 06,2020) Preference for hygiene products to rise, online sales to zoom, amid COVID-19 threat:

CGPL MD and CEO told Vivek Gambhir that a major shift in consumer buying behaviour and preferences is going to take place as a consequence of Coronavirus and they are going to be more conscious about health, hygiene, and sanitation and as a result of this threat and concern, he says that there is a good opportunity for e-commerce companies to boost their online sales as people would prefer to go for contact-free buying through these platforms. After this analysis, FMCG companies are now entering into the manufacturing of sanitizers and related health products as arise in the online sales of FMCG products through e-commerce platforms can be seen clearly.

6) Shashidhar. A (March 20,2020) Covid-19: FMCG majors Amul, Godrej, ITC hike output up to 20% as anxiety buying spikes

Due to the pandemic lockdown consumers have been witnessing stocking out of consumer goods like milk, flour, rice, groceries and personal care products like soaps, sanitizers, handwashes, etc. And in this time e-commerce platforms have been trying their best to meet the consumer's demand for FMCG products. FMCG products like Amul, Godrej, and ITC have raised their production as well as a result of a huge increase in the demand for these goods. They stated that this has been due to the reason that people are preferring to be confined in their homes and buy goods that are contact-free through these portals and see this as a great opportunity for the e-commerce industry in the country to boost and emerge as a profitable platform in the coming years. And with the end of this lockdown period, consumer's buying behaviour and preferences are going to change drastically.

7) Warc Data point (March2020) E-commerce shopping more frequent because of COVID-19

Due to the coronavirus (COVID-19) more consumer shifted their consuming

habits to online. According to the latest report by IPSOS, the jump in e-commerce shopping where India (55%), China(50%), Italy(31%) and Vietnam(56%). This new habit of consumers going to be long last for decades for the e-commerce industry.

8) Bansal.S.(April 02,2020) opinion will consumer behaviour see shift post covid-19

Shuchi Bansal said that, as a consequence of COVID-19 lockdown, there would be a major shift in the supply chain and an increased consumption of e-commerce portals through the internet. It has been estimated that the online stores engaged in sales of groceries and other FMCG products could see a massive shift in demand to avoid going out to crowded shops and marketplaces.

After analysing the consumer buying behaviour from the time India first encountered COVID-19 till the time it went under the lockdown, it could be said that people have become more online shopping for customers.

9) Nath. S.(April 28,2020) Did the lockdown accelerate the digitization of INDIA Inc?

Sanstuti Nath threw light on the term 'digital consumption'. Her study on the consumption patterns of consumers post-pandemic lockdown, showed that the e-commerce companies have seen a significant growth of 70-100% for essential commodities. And this sudden adaptation of digital platforms can be allocated to mobile advertising. Top companies and brands were already benefiting themselves from these platforms, and also now post lockdown this whole scenario is going to change how consumers buy.

10)PTI(April19,2020) Post lockdown, online-to-offline strategy to get prominence in the retail sector: LOT Wholesale

The retail outlet LOTS wholesale have stated that as consumers are now more conscious of their health and protection against the pandemic, there is going to be a drastic change in the consumer behaviour especially in buying FMCG goods and all retailers will be bound to do the sales on online platforms, that is the e-commerce [portals to meet the demands of consumers and promote contact-free ordering and Delivering services. Also, they said that to cater to the changing needs of customers there would be a need to have an omni-channel strategy, online to offline. As for now, there



increased demand for only essential commodities but a considerable amount of time will be taken for shopping behaviour to get normal, as purchasing habits are going to change drastically.

11) Yatti Soni (April,30,2020) The Reset: Covid Highlight Direct To consumer potential for Indian E-commerce

Even before the covid-19 pandemic lockdown e-commerce becoming the need of every household. Due to pandemic lockdown, e-commerce is only supplying the essentials goods so that consumers feel safer and to go out to buy essentials goods from retail stores. According to Capgemini's research on consumer sentiment, his report states that the consumer of e-commerce is going to increase from 46% to 64% over the next to nine months.

12) Anirudh Lasker (May,15,2020) Lockdown impact: India e-commerce market picks pace, may touch 7 trillion rupees by 2023

Due to the coronavirus pandemic, it has pushed the consumer to shift from offline retail stores to online shopping, according to CAGR it says that in 2023 Indian e-commerce is 19.6% between 2019 and 2023. The major growth can be seen in the 2 leaders of e-commerce Flipkart and Amazon.

13) Writankar Mukherjee, Sagar Malviya (May,04,2020) Top multinational from HUL to Apple brace for rising online sales post covid-19

India's largest FMCG goods company HUL chairman Sanjiv Mehta said customers has this fear of coronavirus due which they are scared of going out to buy even essentials goods for them. Online FMCG sales rose to 50% YOY during the march quarter as consumers are more interested in shopping e-grocers instead of local kiranas. In Nielsen report, they mentioned that local retailer share fell by 220bps, entirely taken by either e-commerce or modern retailers in this pandemic lockdown.

14) Khetarpals (May 13,2020) lockdown perks for e-commerce; online sellers recover 30% order volume in a week.

Everyone, especially business are curious to know how consumer behaviour is going to change post lockdown period. As to meet the demands, consumers have shifted to the online industry, have witnessed a rise of 100 percent as compared to the pre lockdown period in FMCG



products. However, these companies are allowed to do their operations as per the red, orange, and green zone in the country. While the online fashion industry is expected to rise again after the lockdown, whereas, the cosmetic sector has not seen recovery very till now and will take a little longer to recover.

15) Avatar.P(May05,2020) lockdown 3.0: Flipkart, Snapdeal sees heavy traffic for non-essentials items.

As with the ongoing lockdown period, FMCG products are on high demand, but once the lockdown gets over, how consumer behaviour is going to changes is a big question. With the lockdown 3.0e-commerce platforms have been permitted to sell non-Essential items in the orange and green zones and with this Flipkart has stated that most searched belongs to the personal care products like trimmers, electronic goods like mobiles, laptops, and fans, air conditioners to beat the heat. Snapdeal claimed that they have received a huge proportion of 75% of the total orders from these orange and green zones in the country. Estimates are that there would be huge demands for items like these post5 lockdown period.

16)Tech desk, (May 19,2020) lockdown 4.0 relief: Amazon, Flipkart welcome non Essential deliveries in red zones.

Till lockdown 3.0, the e-commerce companies were allowed to deliver the essential commodities as well as non-essentials to only orange and green zones but with lockdown 4.0. E-commerce companies have welcomed the guidelines of the government to deliver essentials and non-essentials in all the three zones, however, containment zones will be getting only medicinal deliveries along with the groceries and so .With all this e-commerce companies are trying to meet the ongoing demand for all the categories of goods and are estimating this to be an opportunity for e-commerce platforms.

3) RESEARCH METHODOLOGY

3.1 PURPOSE STATEMENT



The research has been conducted to study the socio-economic status and buying pattern during pandemic period. The study shows that how the customer changed their buying pattern and shifted towards online platform for shopping. This study also shows that what impact has been done in E-commerce industry.

3.2 DATA COLLECTION TOOLS

In order to carry out this research and to collect the primary data, a questionnaire has been prepared which contains 25 questions, and a fields survey has been done.

3.3 REPRESENTATION OF ANALYSIS

Bar graph, diagram, pie-chart, charts, table etc. are used for the purpose of analysis.

4) ANALYSIS AND INTERPRETATION OF DATA

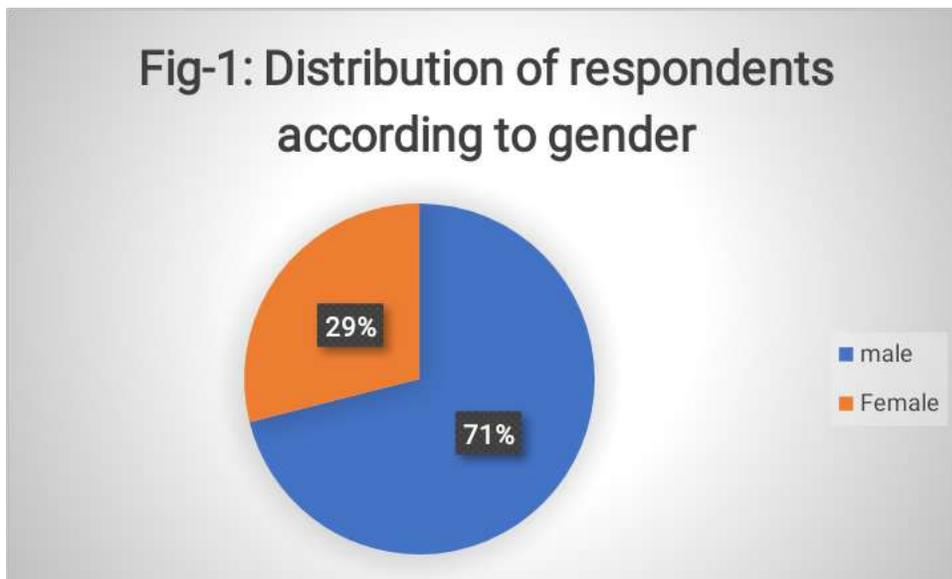
The questionnaire is based on knowing the Socio-economic status and buying pattern during COVID-19 pandemic period. The recorded response of total of 38 consumers of E-commerce buying products online before lockdown and during lockdown from online platforms. This questionnaire gives a view of customer's buying pattern through online and offline. The questionnaire contains questions which covered to know that at what level consumers are shifting and it also shows that whether that consumer used to buy online groceries and other essential products or not, or if that person is a first-time user of e-commerce just signed up during the lockdown period. The respondents are required to choose one option on their behaviour like yes or no. the questionnaire also contains the demographics



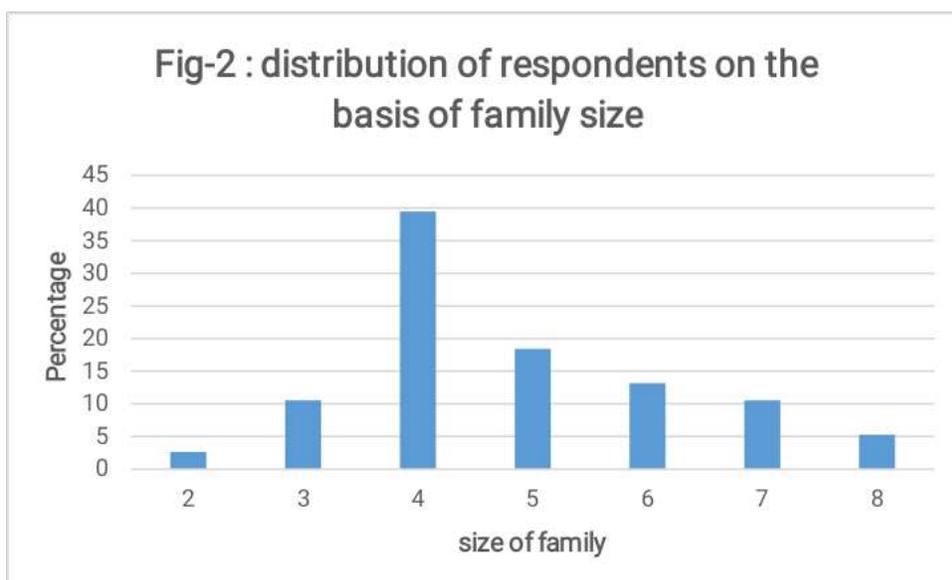
like gender, occupation, income level, etc.

The pie charts and bar graphs are going to show how different respondents reacted towards the survey and there are different sets of questions to know the customer buying behaviour during pandemic.

There are 29% female respondents, and 71% are male respondents who participated in the survey and helped to give a clear picture on socio economic status and buying pattern during pandemic, shown in Fig.1.



The survey also shows that the maximum number of respondents have 4 members in their family as shown in Fig.2 below.



The information gathered from this survey shows that maximum families have only 1 employed member in their family. 39% respondents have only 1 employed member, 32% respondents have 2 employed members, 24% respondents have 3 employed members, 3% respondents have 4 employed members, and 2% respondents have 5 employed members in their family as shown in Fig 3 below.

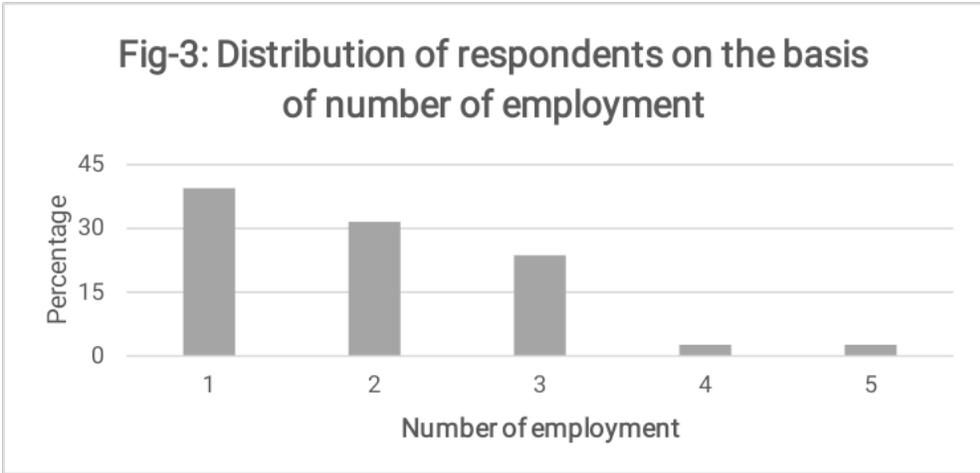


Fig.4 below shows the income level of the respondents, and the maximum number of respondents have monthly income of 35000 and above, that is, 39%, and next 19% respondents have income level between 20000-24999, and 16% respondents have income between 25000-29999, 8% respondents have income between 30000-34999, and 7% respondents have income between 0-9999, 6% respondents have income between 10000-14999 and rest 5% respondents have income between 10000-14999.

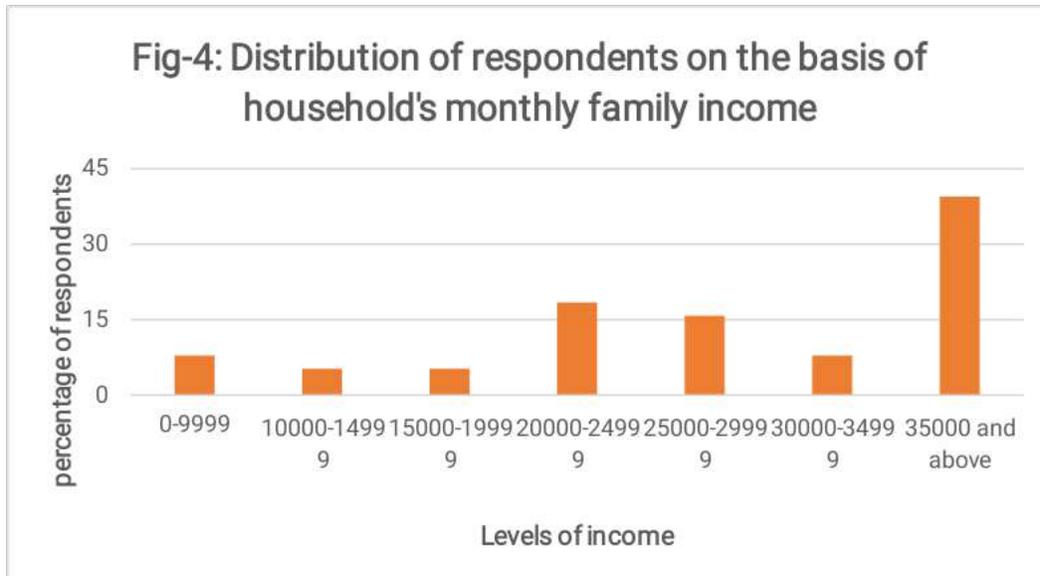
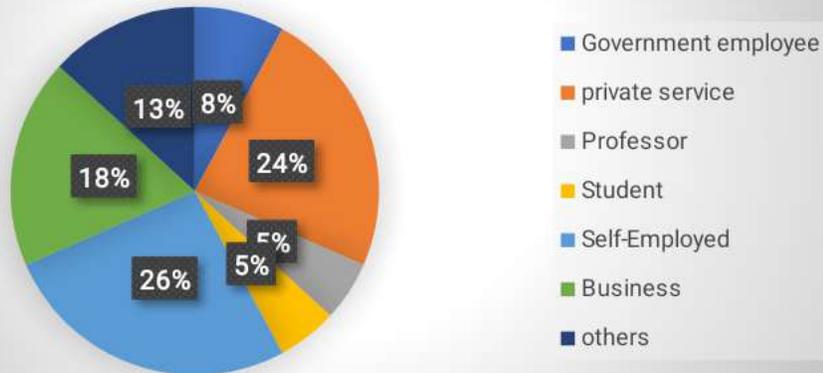


Table-1 Distribution of respondents on the basis of employment

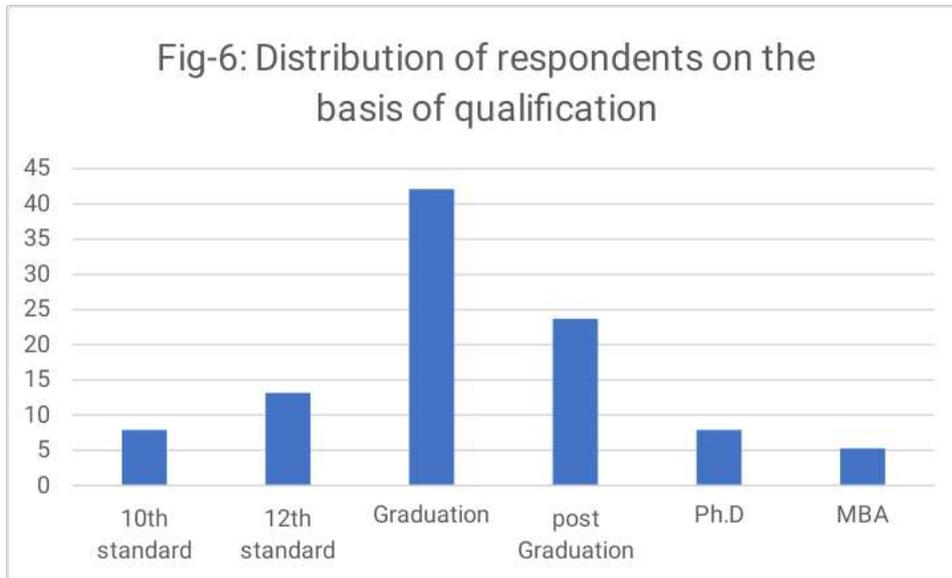
no of respondent	Number of family members in formal sector	percentage of respondents
9	0	23.68421053
14	1	36.84210526
11	2	28.94736842
2	3	5.263157895
1	4	2.631578947
1	5	2.631578947

The occupation of the respondents is shown in fig.5 below, according to the chart the greatest number of respondents are self-employed with 26% participation survey and 24% respondents work in private sectors and 18% are engaged in business and 8% respondents are government employees and 5% are professors and 5% are students and the rest of 14% have chosen others option.

Fig-5: Distribution of respondents on the basis of nature of occupation



The survey also gives information about the qualification of the respondents. From fig.6 shown below, it has been concluded that maximum number of employees are graduate who participated in this survey with 43%, 23% respondents are Post graduate and 13% respondents are 12th pass and 8% respondents are 10th pass and 9% respondents holds the degree of Ph.D and rest of 4% have done MBA.



Along with other information, this survey also gives shows the attack of coronavirus on the family members of the respondents. In fig.7 below, 13% have responded with 'Yes' that their family members have suffered from deadly coronavirus and 87% have chosen 'No'.

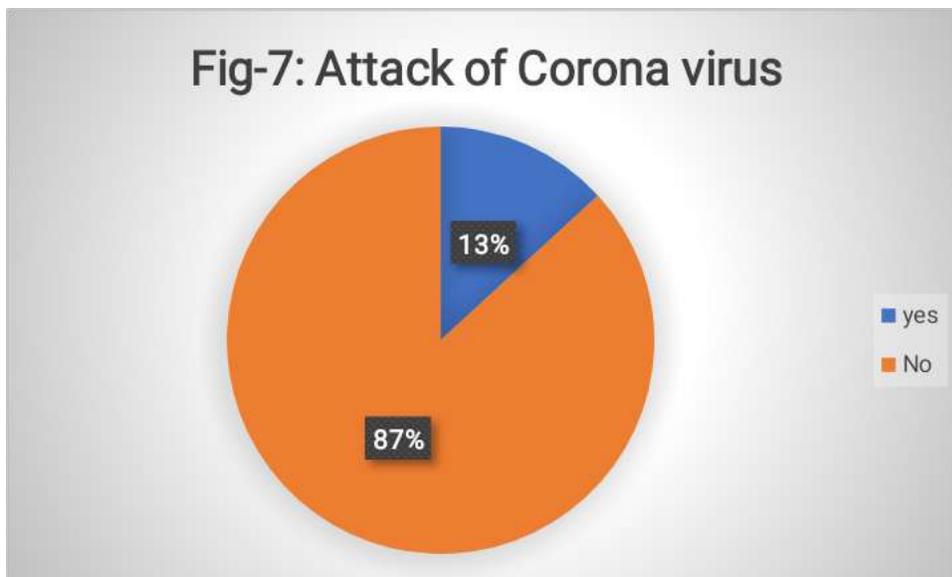
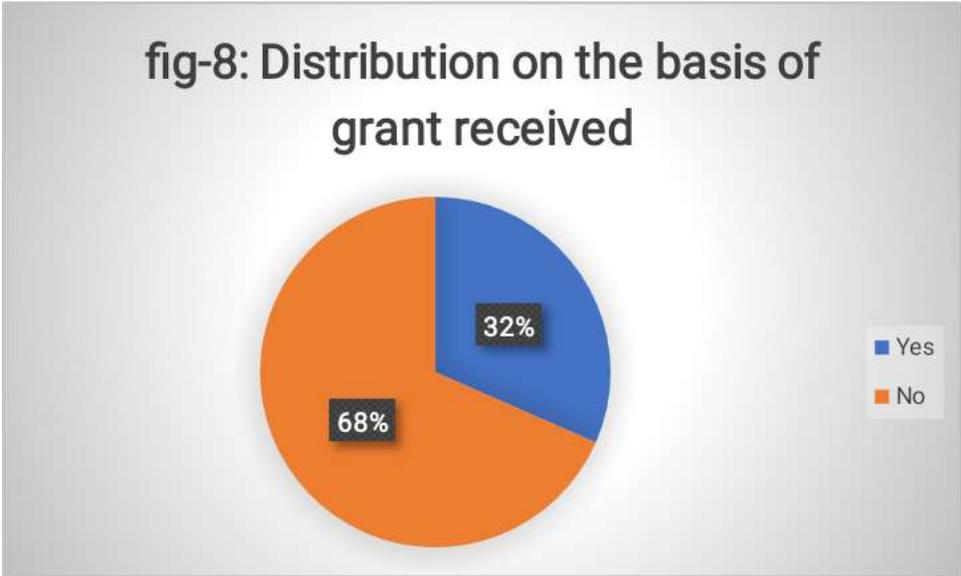


Fig.8 below shows that 32% of respondents receives grant whereas 68% of respondents does not receives any grant.



As shown in fig.8 , 32% respondents receive grants. Among them 28% respondents receive grant from any institution, 26% respondents gets grant from unknown friends, 24% from relatives, 2% from friends and the rest of 2% respondents receives grant from both 1 and 2 sources as shown in fig.9 below.

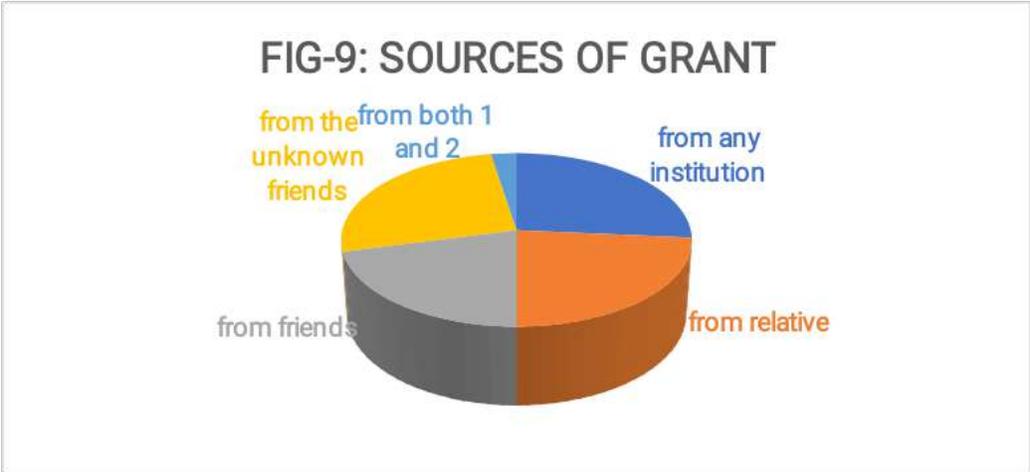
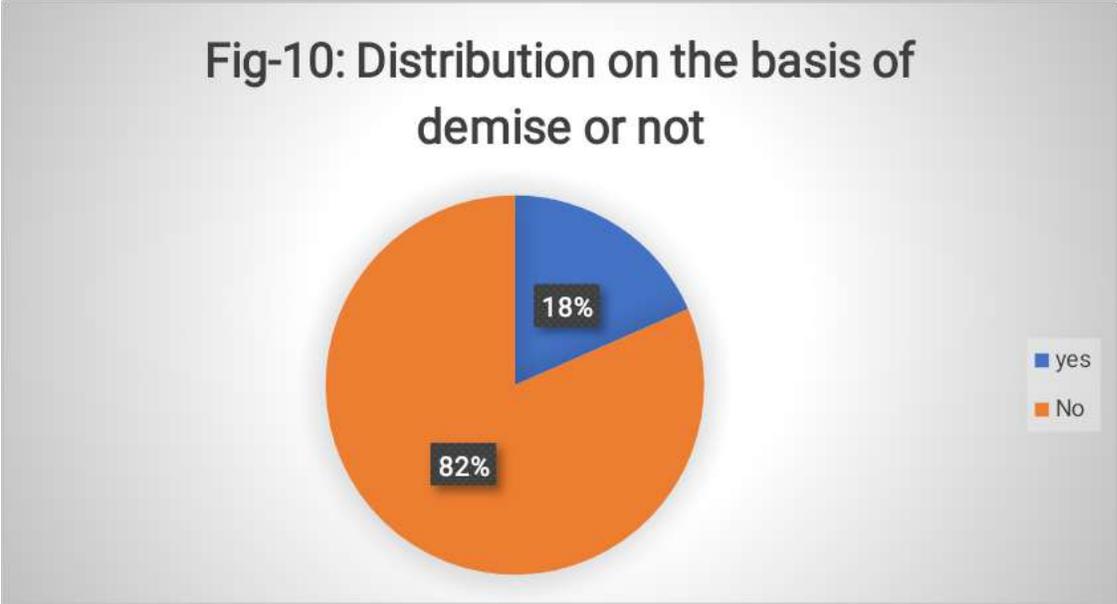
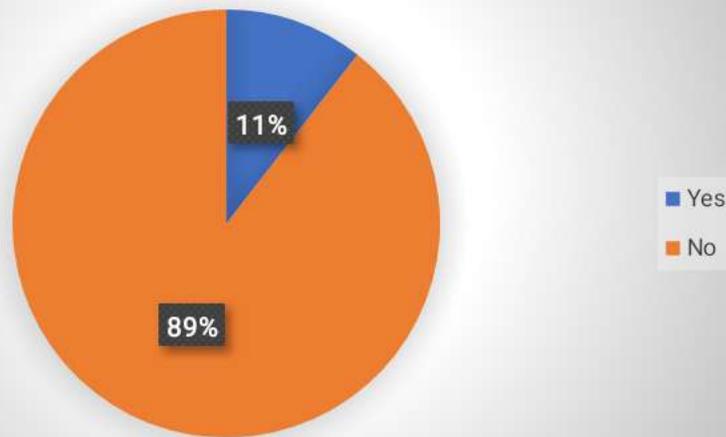


Fig.10 shows that 18% respondents have lost their beloved family member in this sadly period of pandemic. Whereas 82% respondents have replied with 'No'.



It has also been asked from the respondents that whether the grant that they receive is adequate or not. 11% respondents agree that the grant they receive is adequate. 89% respondents say 'No', as shown in fig.11.

Fig-11: Whether grant is adequate?



This survey also gathered information about the job lost by the respondents or any family member of respondents. 21% respondents say that family member has lost their job during this pandemic whereas 79% say that they are still doing the same job as they were doing before this pandemic, and it can be seen in fig.12.

Fig-12: Whether any member lost job or not?



Among all the respondents, 74% respondents say that there is significant decrease in their income, whereas 26% respondents say that the pandemic

has not affected their income, and it is shown in fig.13 below.

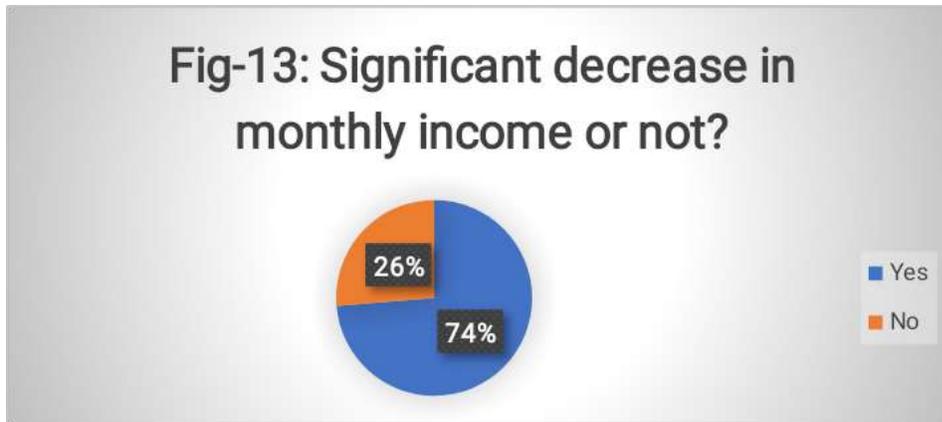
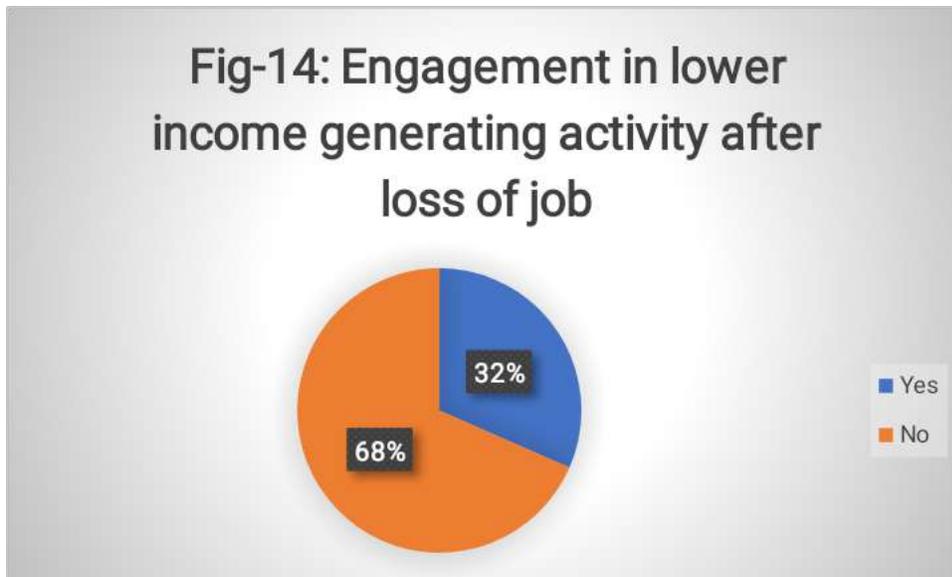


Fig.14 below, shows whether the respondents or any of their family member engaged themselves in lower income generating activity after loss of job or not. 32% respondents replied with yes and 68% respondents say No.



The opinion regarding increase in monthly expenditure has also been recorded.84% respondents have observed and replied with yes that their monthly expenditure has increase during pandemic whereas 16% say 'No'.

And it is shown in fig.15 below.

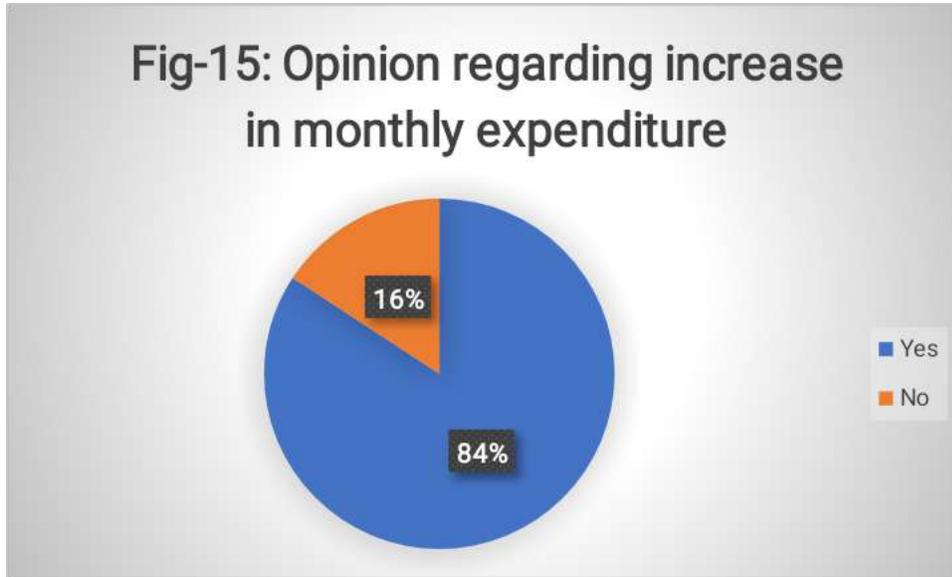
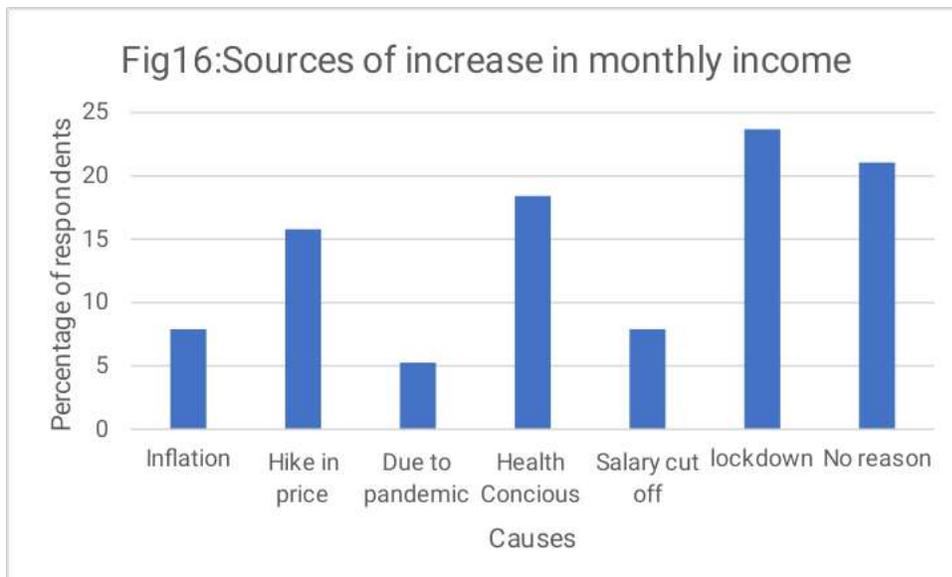
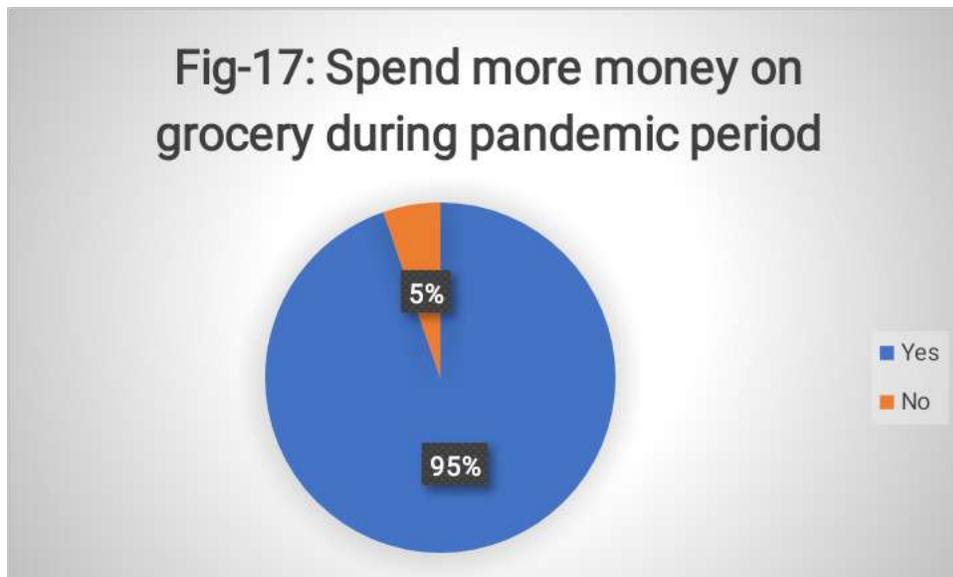


Fig.16 shows the reasons behind increase in monthly expenditure. 24% say it is due to lockdown, 18% say that it is due to health consciousness, 17% say that it is due to hike in price, 7% sat that it is due to inflation, 8% say that it is due to salary cut-off whereas 22% responded that there is no reason.



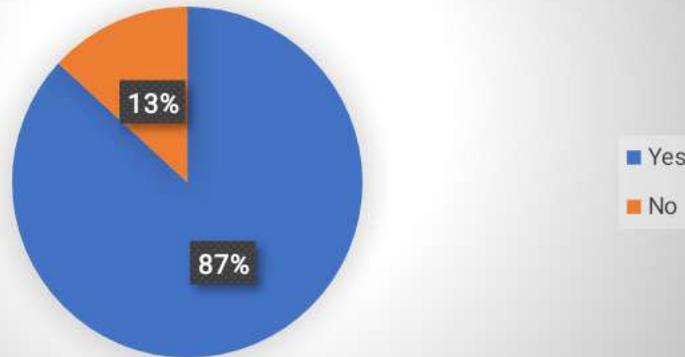
From all the respondents, the question ask that whether they spend more

money on grocery during pandemic period. 95% respondents say that yes they are spending more of their income during pandemic period. whether as 5% of respondents say 'No'. It is shown in fig.17below.



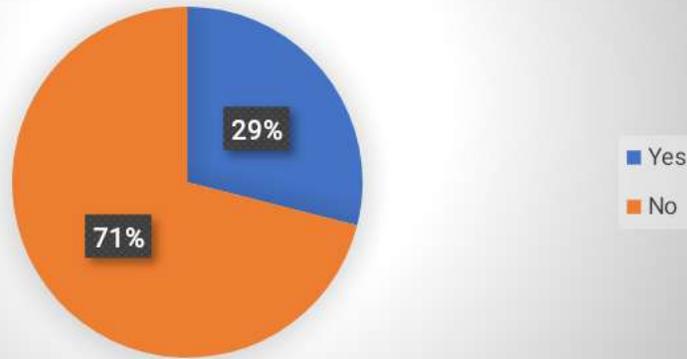
The question about the relative importance of online shopping arises here. When the respondents were asked about the relative importance of online shopping during pandemic. 87% respondents say that online shopping has contributed a huge helping hand and made them buy essential products easily delivered to their door at time. And it helped a lot in maintaining social-distance and covid norms. Whereas 13% respondents still going with the traditional buying pattern and replied with 'No'. and it is shown in fig.18 below.

Fig-18: Relative importance of online shopping



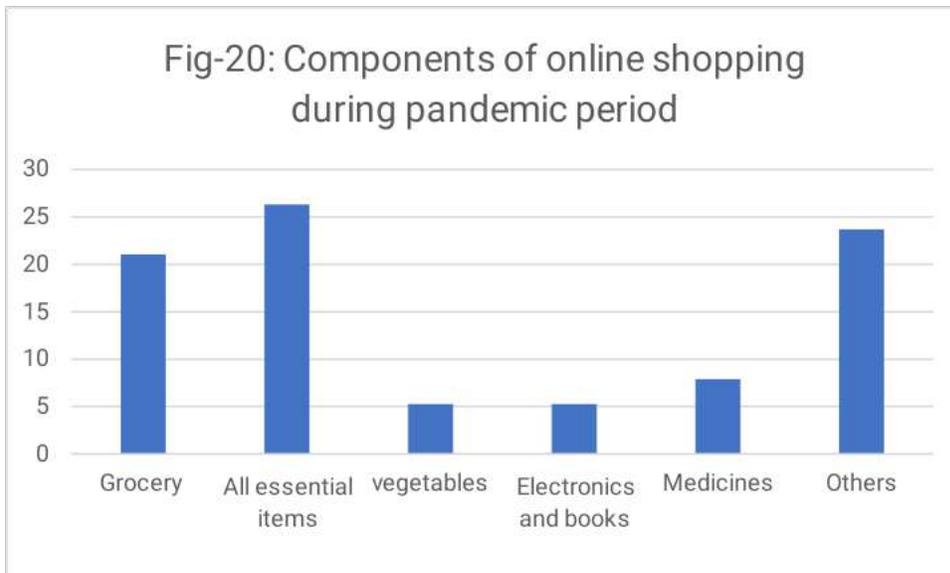
When the respondents were asked about their previous experience regarding online marketing as shown in fig.19. Only 29% respondents say that they were using online platform before pandemic also. 71% respondents say that previously they were not using the online apps for buying anything, but as the COVID-19 hit the world they have to shift towards online platform for buying products as it is safe and helps to stay at home and maintain social distancing and ultimately helps to decrease the chance of spreading the virus as shown in fig.19 below.

Fig-19: Previous experience regarding online marketing

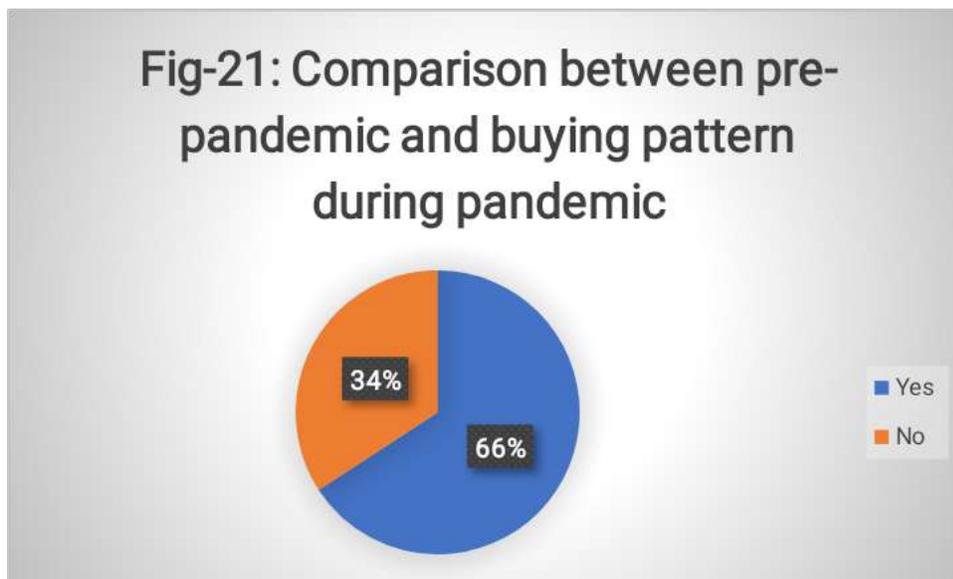


The respondents gave brief description about the products that they purchased online during this pandemic. 26% respondents ordered all essential items through online, 23% respondents ordered grocery, 5% ordered vegetables, 8% respondents ordered medicines, 5% respondents ordered electronics and books and the rest of respondents ordered other products through online during this pandemic

Fig-20: Components of online shopping during pandemic period



A comparison has been done between pre-pandemic and during pandemic buying pattern by the consumers. 66% respondents say that their buying pattern has changed whereas 34% respondents say that their buying pattern is same as before pandemic. And it shown in fig.21.



5) CONCLUSION AND FINDINGS

The research has found that the most important aspects of those consumers who have never bought anything before have shown interest in buying goods online. As in the above charts shows that 66% respondents say that buying pattern has changed. It seems to be a sharp jump in the new customers who freshly signed up to buy goods through an online platform. Not only the number of new customers has been increasing but also the satisfaction level is also increasing dramatically. These are because of several reasons like, the person fear to go out to buy goods offline due to the COVID-19. So they prefer and trust more in E-commerce industry rather than buying goods traditional stores. According to some articles,it has been seen that it's difficult for the E-commerce companies to fulfil the demand of the customers. From this we get an idea that more and more people are keeping on adding themselves and becoming member of online E-commerce platform.

COVID-19 helps E-commerce to generate more customers because everything was lockdown and people were scared to step out from their house, so they prefer to buy online and many of the new customers also joined.

The respondents say that the E-commerce industry played a vital role during the lockdown period. It availed people to get the essential products at their doors which saved people from going out during this pandemic. It ultimately helped them to stay away from coronavirus and to maintain COVID-19 NORMS like social distancing. It seems that customers are going to rely on the E-commerce platform to buy essential goods online. It clearly shows that E-commerce industry is going to boom in the future.



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