Chapter 3: Research Methodology

3.1 Research Area
3.2 Selection of Respondents
3.3 Data Collection
3.4 Data Analysis and Interpretation
3.5 Limitation of the study
Chapter 3: Research Methodology

Human being is known as a curious creature. He is always involved in some or the other thought, and it is very difficult to measure these thoughts. Research or invention is the cause and result of this curiosity. He is always moving ahead in the direction of investigating the unknown facts. Initially he tries to understand natural occurrences and thereafter social events; since then the social research has emerged. Inquisitiveness always goes on increasing and he is always involved in discovering things.

3.1 Selection of Research area

Scope of research is a very important aspect in the research plan. Specific geographical background is required for conducting research. Selection of research area is extremely difficult task. For this purpose, research sector needs to be carefully selected because if the research is conducted without selecting the unit and scope of research, it is possible that the study becomes extremely confusing. As a result we can arrive at any specific conclusion. In order to select the scope and unit, the researcher should also keep in mind the time, place and financial limitations so that the research is conducted appropriately. It also important for a researcher to select the area which is nearby and familiar to him so that he could easily visit those areas and the research work is completed within the stipulated time. Therefore the researcher has tried to study the Participatory Irrigation Management system and its impact on sustainable development of tribal community under the partnership of the beneficiary farmers of irrigation plan, from Mandavi Taluka of Surat district in South Gujarat. Efforts are made to improve the living standards of the beneficiary farmers by increasing their participation in the management of irrigation plan, increasing irrigation capacity and the farm production. The aim is to know the real picture. Therefore a detailed introduction regarding the subject and the field of study is presented in this chapter.

About District

Surat is a district in the state of Gujarat with Surat city as the administrative headquarters of this district. Surat City situated on the left bank of river “Tapi” once one of western India’s major ports and trading towns. Surat is second largest city in Gujarat out of 33 districts. Surat is famous for its textile and diamond business. Three-quarters of the world’s diamonds are cut and polished in Surat. Surat has highest number of flyovers in Gujarat state. Surat is surrounded by Bharuch, Narmada (north), Navasari (South) district and east Tapi district to the west is the Gulf of Cambay. It had population of 6,079,231 of which 79.68 % were urban as of 2011. On October 2007 Surat district was split into two by the creation of a new Tapi district. Under the Surat District Re-organization act 2007.

History of Surat

Surat, previously known as Suryapur, is a city in the Indian state of Gujarat. Surat - the modern port city of today boasts of a great historical and cultural heritage. The history of Surat takes us back to the epic age of Mahabharata and Ramayana. According to mythological beliefs, Lord Krishna stopped in the city whiles his journey from Mathura to Dwarka. Surat of today has earned the reputation of an important industrial hub and commercial center of the country. A glimpse on the history of Surat will prove that the city has always been a great
trading center. The great explorer Hiuen Tsang referred the Surat City as Sowrata and described it as a business town on the shore of Arabian Sea near Gujarat.

Surat reached the highest point of prosperity during the sixteenth century. The Surat Port was considered important by the European traders. The British and the Portuguese waged battles against each other to gain supreme control over the trading route. The French and the Dutch also arrived in the city with merchandising objectives. The place is also known as India's western gateway because of its strategic position. People of many races from various places have come to Surat from the ancient times, because of which, the city has witnessed a blend of many traditions and cultures.

Surat is also known to be the world’s largest diamond manufacturing center, home to over 5,000 diamond manufacturing units including most advanced, large-scale diamond cutting factories in the world. The Surat SEZ boasts of over 100 listed companies and is fast emerging as a leading jewellery production hub.

The art and culture of Surat is much diversified and the people here are generally of soft nature. The pleasure loving people of Surat have a very stylish and spirited outlook. The language that is mostly spoken in the Surat City is Surti Gujarati language.

Many people refer to the unique culture of Surat as the “Surti Culture”. Surti culture though distinct in its flavor still retains the main essence of the Indian culture. Most residents here are Hindus, though other minority communities like Muslims and Christians are also its residents. Most of the major Hindu festivals are celebrated here but especially the festivals of Navaratri and Diwali along with Makar Sankranti are celebrated with great enthusiasm.

Apart from the history and highlights of Surat, Gujarat is also proud to be the birthplace of Mahatma Gandhi, India's Father of Nation. Today the state has conserved Mahatma with museums, statues, ashrams and much more. This is the place where he was born and started movements that forced British's out and gave India independence. The very famous Sabarmati Aashram, which was one of the residences of Gandhi, is just 3-4 hrs drive from Surat. One who wishes to learn more about the life of Mahatma Gandhi should visit this place. Diamond City” Surat is well known for its Diamond business. “Silk City” Surat is also known as “Textile city”

**Geography**

Surat district’s total area is 4212 sq. kms and the density of Surat district was 1376 per sq.km at the 2011 Census.

**Demographics**

According to the 2011 Census Surat district has a population of 6079231 out of that 33,99,742 Male and 26,79,489 Female population. The district has population Density of 1376 inhabitants per square kilometer. Its population growth rate over the decade 2001-2011 was 42.19%. Surat has sex ration of 788 females for every 1000 males and literacy rate of 86.65 %.
Population of Surat:

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<table>
<thead>
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<tbody>
<tr>
<td>Population</td>
<td>60,79,231</td>
</tr>
<tr>
<td>Literacy Rate</td>
<td>86.65 %</td>
</tr>
<tr>
<td>Male Literacy</td>
<td>91.05 %</td>
</tr>
<tr>
<td>Female Literacy</td>
<td>81.02 %</td>
</tr>
<tr>
<td>Urban Literacy</td>
<td>88.88 %</td>
</tr>
<tr>
<td>Rural Literacy</td>
<td>78.01 %</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>788</td>
</tr>
<tr>
<td>Urban Sex Ration</td>
<td>757</td>
</tr>
<tr>
<td>Rural Sex Ration</td>
<td>922</td>
</tr>
<tr>
<td>Child sex ratio</td>
<td>836</td>
</tr>
<tr>
<td>Urban sex ratio</td>
<td>817</td>
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<tr>
<td>Rural sex ratio</td>
<td>922</td>
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<tr>
<td>Child Sex Ratio</td>
<td>836</td>
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<tr>
<td>Urban Sex Ratio</td>
<td>817</td>
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<tr>
<td>Rural Sex Ratio</td>
<td>922</td>
</tr>
<tr>
<td>Village</td>
<td>713</td>
</tr>
<tr>
<td>Taluka</td>
<td>10</td>
</tr>
<tr>
<td>Surat, Choryasi, Olpad, Kamrej, Mangrol, Mandvi, Umarpada, Bardoli, Mahuva, Palsana</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>4212 Sq.km.</td>
</tr>
<tr>
<td>River</td>
<td>Tapi, Kim, Mindholi</td>
</tr>
<tr>
<td>Main Crop</td>
<td>Wheat, Juwar, Sugar Cane, Tuvar, Cotton, Pulses, Mango, Fruits</td>
</tr>
<tr>
<td>Port</td>
<td>Hajira, Magdalla</td>
</tr>
<tr>
<td>Industries</td>
<td>Textile, Diamond, Jari work, Art Silk, Sugar, Paper, Cement Pipe, Salt, Fisheries, Chemical Fertilizer</td>
</tr>
</tbody>
</table>

Culture, festivals and Places for Visit

Surat is known for its cuisine, which includes perennial favorites such as "ghari" (a type of sweet), Locho, petis, undhiyu, rasaawala khaman, Surati Khaman (Spicy), Sarasiya Khaja and Surati Chinese. Unlike cuisines in other parts of Gujarat, Surti cuisine is quite spicy. Roadside kiosks, called "laaris" or "rekdis", are quite popular in Surat. Ponk is a roasted cereal. An old saying in Gujarati, "Surat nu Jaman ane Kashi nu Maran", means "Eat in Surat and Die in Kashi" to have the best for one's soul.

The major Hindu festivals are celebrated in Surat. Navaratri, Diwali and Ganesh Chaturthi are celebrated with great enthusiasm. The kite-flying festival of Uttarayan, which falls on Makar Sankranti – 14 or 15 January, or 'Vaasi Uttarayan', celebrated with great enthusiasm by flying kites and shouting 'Kai Po Che' (I have cut) – is very popular in the city. It is also well known for the celebration of Chandi Padvo which usually occurs in October and is a holiday unique to Surat.
Places of tourist in Surat are the old fort builds by Muhammad-Bin-Tughlag, the Unai hot spring, the beautiful beaches of Ubharat and Tithal, the villages of Bardoli and Dandi where Gandhiji started movement and Dandi March respectively. The Vansada National Park near Surat is famous for the wild boars, leopards, panther it houses. Ukai and Kakrapar Irrigation Scheme also goop places for visit.

Graph 3.1.1 Rainfall Pattern of Surat District

About Project and Research area

Water management is a major concern of agriculture in the world. Its importance derived from water’s effect on livelihoods, food security, and the sustainability of environmental systems. The huge population growth and the frequent drought shocks are making water resources under severe threat and calling for global efforts for new concepts of water planning and management. Irrigation sector is facing problem of wastage of water, low utilization of available water, disputes between farmers leads to tail ender deprivation and resulted poor irrigation, lack of planning and coordination between farmers create demand at one time and create havoc in water distribution leads poor irrigation and wastage of water. These all leads to insufficient water and no time management which ultimately leads to less agriculture production and poor water rate recovery.

Research area: Participatory Irrigation Management:

The concept of Participatory Irrigation Management (PIM) has been recognized all over the world as a tool for improving irrigation management along with sustainability of the system. Irrigation systems need to be restructured to make water management efficient. However increasing demand of water in all sectors including irrigation made it imperative that the efficiency of the Irrigation Water Management must be increased. National Water Policy and State Water Policy, lay emphasis on participatory irrigation management to be adopted as an essential strategy for improving the performance of all the irrigation projects and therefore farmers should be involved progressively from the grass root level particularly in water distribution & canal maintenance. Thus the Government has planned to involve farmers-users in a more systematic way, at least, at the tertiary level of the canal systems for alleviation of the management problems.
Research Project:

The Research project name is Ver Medium Irrigation project and it is situated in Mandvi block of Surat district in Southern region of Gujarat. In South Gujarat approximate 200,000 hectare area covered under participatory irrigation management and 262 water user association formed by government and NGO for irrigation management. The covered project under this research Ver medium irrigation project located in Mandvi taluka of Surat district. Participatory Irrigation Management work is implemented from year 2007 in this project. There are 28 villages, 3500 hectare area and 3057 farmers come under project. There are 11 water user association in this 3500 hectare command area, 3057 members associated with this irrigation cooperative society(WUAs). The Participatory Irrigation Management work done by Irrigation Department, NGO name Aga Khan Rural Support Programme (India) and by benificiaries. So Researched took village farmeres, NGO representatives and Irrigation Department staff as respondents.

Location (area) of Research Project: Ver Medium Irrigation Project located in Mandvi block of Surat district.

About Mandvi taluka:

Mandvi is a town located at about 70 km east of Surat in the downstream of river Tapi which is at an altitude of 50 meters and 113 km (Arial distance) from sea coast with an annual rain fall of 67 inches. Mandvi an ancient town was once a State of King Bhil with its capital at Pipalwada. Mandvi was predominantly tribal area. After independence, Mandvi became an integral part of old Bombay State. When Bombay State was bifurcated, this area came under newly formed
Gujarat. Town Mandvi is well known for the art of Carpentry, Blacksmith work and handloom based village industry.

The area has the presence of industries as there is an Industrial zone Kim which is at 45 km from Mandvi at Ahmedabad-Bombay railway line. And also a power generation unit of K.A.P.S a nuclear power plant is situated at 17 km away east and the area is well known for sugarcane factories which area situated at Bardoli, 30 km from this town. The town is well connected to surrounding towns by Roads. There are three State highways passing through the city. In Mandvi Residential land use pattern is predominated in the inner part of city. Commercial land use is broadly mixed type and it has mainly retails shop and general groceries stores. The town can be divided in two parts. Left side part can be considered developing area and right side part is undeveloped, when we do a relative study with the local development scene.

There are 148 villages comes under 86 villages Panchayat and 19 group gram panchayat in Mandvi block. Total area of this block is 73113 sq.kms and 9725 hectare is forest land. 1, 85,911 is a total population of this block, out of that 50.50 % comes as male population and remaining is female population. 76 % of total population falls under ST (Chaudhari, Vasava, Gamit) population, 2.75 % SC population and 1116 household under primitive tribe call kotwalias in Mandvi block. literacy rate is 59 %. Total cultivable land is 46677 hectare and out of that 23410 hectare is irrigable land. All 148 villages have access to electricity. There are 8 banks in Mandvi and 6 co-operative banks, 1 land development bank and 20 Agri co-operative societies exists in Mandvi block. There are five higher secondary, ten secondary school, three collages (one Art – commerce, one fine arts college and one MBA, BBA collage) and one ITI are in town place. Mandvi block has 57 sub center, 7PHC and 2 CHCs and also there are private doctors with MBBS, MS, MD and one eye hospital ,Tejas hospital managed by Tejas foundation are there. There is Market yard at block level for selling Agriculture produces. There is Rice mill, petrol pump, Sugar factory at Mandvi block.

There are different type of source for irrigation like Dams, wells, lift irrigation, Bore well s in Mandvi talukas. There are Medium irrigation project like Ver (Amli dam), Kakrapar project, Lakhigam project and small project like kevadi and Isar. Tapi river is passing through Mandvi town and there are small small river also in Mandvi block like Ver khadi. The main occupation of village people is Agriculture and Animal husbandry. 5 to 10 % people are doing job like government and private job also. The labours are working as Agriculture labour in some of areas and some goes to nearest place like Kim, Surat. There are small scale three Kapachi factory and some labours are working there also.

### 3.2 Selection of Respondents

#### Introduction of Universe, Selection methods and Sample Size

The researcher has to decide the sample size for study in advance, which means he has to decide in advance, the units, as a part of the universe which he wishes to study. Sample selection is very important in conducting research. The samples or the units which a researcher selects for his research should adequately represent it as a whole. If there is an error in the selection of samples, the whole study will prove to be meaningless. Therefore the researcher should carefully select the samples. Mostly random sampling is considered to be more convenient in research. Each unit gets an equal chance of selection in this method. For the selection of samples in this study, a list of the members was available with the irrigation committee formed for the management of irrigation plan. 11 irrigation committees are formed
with a total of 3057 members. 28 villages are included in it so that 10% of the members from that are selected as samples, which represent the entire members of the scheme, which are 305 farmers. In addition to that 2 farmers from the village of each irrigation committee are selected, who are not directly associated with this scheme, but who conduct farming in the village by themselves to earn living. 2 farmers per village are selected that means total 22 farmers are selected who represents non-beneficiary farmers. In addition to this, 4 officials from government irrigation department, associated with this scheme are also selected as samples, which represent the irrigation department. Apart from these 7 representatives of non-government organization are also selected as samples. Leaders from various committees like irrigation committee, milk committee and members of gram panchayat/ Sarpanch etc. are also selected as samples. A total of 409 samples are selected as respondents from various sectors, so that each village, farmer (unit and individual) gets an equal chance of selection through these samples. The details of each respondent are presented in the table below:

There are other people those who are associated with this project direct or indirect. Under Participatory Irrigation Management there are three types of stakeholder in this project.1. Beneficiaries of project, 2. NGO staff, and 3. Irrigation Department staff. So Researcher has taken these three types respondents. Apart from that for fulfilment of objectives it’s needed to take sample of other farmers those who are living in same village but not a direct beneficiaries of this research project. There are others respondents like milk co-operative leaders and Gram Panchayat leaders, based on above different type of respondent the following types of respondents took for research work.

### Types of Respondents

- **Beneficiaries of the Project**
- Village Farmers those who are out of command area
- Government staff those who are associated with
- Village leaders of water user association
- Village leaders of Milk Co-operative
- Gram Panchayat Representatives
- Non-Government Organization’s representatives
## Integrated table of covered different types of respondents

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Types of Respondents</th>
<th>Nos. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Beneficiaries of the Project – eleven water user associations</td>
<td>305</td>
</tr>
<tr>
<td>2</td>
<td>Village Farmers</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>Government staff – 4 staff members</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Village leaders of water user association – 11 WUA @ 2 members from each</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>Village leaders of Milk Co-operative : two society 3 from each</td>
<td>27</td>
</tr>
<tr>
<td>6</td>
<td>Gram Panchayat Representatives : two Panchayat – Sarpanch</td>
<td>22</td>
</tr>
<tr>
<td>7</td>
<td>Non-Government Organization’s representatives</td>
<td>07</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>409</strong></td>
</tr>
</tbody>
</table>

As per the above table total 409 samples took as respondents which types showed in following graph.

### Graph 3.1.2 Showing types of respondents covered for research
3.3 Data Collection

Research is an important aspect whenever we are planning to undertake a new endeavor or a want to study about something. Thus research is the basis on which the success of the work is depended. Thus research method is used as a part of rural management. Each research is undertaken through a fixed method. Specific techniques and tools are used for the consolidation and analysis of the data. Various techniques have to be used for consolidating the data. There are two major sources to collect data for research related work, which are used for the study presented.

Primary information:

The information collected by the researcher himself for the first time is known as primary information. Information collected through observation, visits, questionnaire, schedule etc. is known as primary information. The presented information is collected from the research field.

Personal visits

Personal visit is a method by which the researcher personally meets the subject under study, asks the relevant questions and tries to get the information required for the research. Personal visit is a social interactive process between the researcher and the respondent, through which the respondent feels free by eliminating the shyness, doubt and unfamiliarity and provides an opportunity to receive realistic information in friendly environment. It also provides opportunity for subtle observation and also gives an idea about the past situations. The researcher has collected the primary information related to the concept, history and the respondent farmers of Mandavi Taluka of Surat district by personally visiting the members of water user associations and secretary of water user association, government officials associated with the project, representatives of the non-government organization associated with the functioning of the project, Talati and Sarpanch of the village, leaders of irrigation and milk cooperatives society. Thus we were able to gain a real picture of the study area.

Schedule

Schedule is an important tool for survey. According to Goode and Hatt, schedule is a form containing various questions. The visitor personally visits the person under study and fills the form by himself. In case the respondent doesn’t understand the question, then the researcher presents it in a way which is understood by the respondent. In addition to that if the researcher encounters some doubt in the responses, then he can also ask sub questions related to it and can get the answers to the main question. Here the researcher has also observed the expressions and the entire situation of the respondents. Through the schedule, efforts are made to obtain the individual opinions of the respondents regarding their general information, family details, land related information, farming and non-farming income, information related to physical assets, farm production, expenses and income related information, process undertaken in the formation of irrigation committee, management, benefits, future planning, rules and regulations/policies of the irrigation committee, government policy, roles and responsibilities of various stake- holders associated with the project etc. Information related to the subject matter was given to the respondents through personal visits and details related to each question were filled by the researcher himself.

This method is very useful in conducting research as the required information can be easily collected and the respondents also do not face any difficulty in answering the questions. The
length of the schedule is also prepared adequately as required so that the respondents do not feel the boredom.

**Scrutiny of the Schedule**

The researcher has prepared the schedule keeping in mind his subject and the objectives of the study. Prior scrutiny of the prepared schedule was done to finalize it regarding the type of questions and the details to be included in it. In addition to the discussions with the leaders associated with the irrigation committee, representatives of the irrigation committee and representatives of voluntary institutions, as well as by referring to prior conducted researches and documents of the irrigation committee, the researcher had eliminated unnecessary questions in the presented research under the guidance of the Guide. In this way the schedule was finally prepared. Efforts are made to gain the reliable information through schedule. Prior checking will be an important aspect for this.

**Method of Observation**

Poling Yong defines observation as “observation is a process to collect information related to an individual, thing or a situation.” That means to observe the event or situation under study, taking place with our own senses and gather information regarding the same. Keeping in mind the objectives of the presented study, exchange of information is an important aspect to go to the roots of the subject. For this, efforts are made through this technique to know the reality of the subjects under study by examining their behavior, appearance, style of living, social life etc.

**Case study**

In order to fulfil the objectives of the research and to get the real picture, case study was also conducted among the villagers and among various organizations.

**Secondary information**

Information collected for any other purpose but used for the research purpose is known as secondary information. If a researcher uses the information received from any other individual or institution for his study during the research, than such information is called secondary information. Secondary information is mainly received from the documents. Such information is used in the presented study.

**Library**

During his research work, the researcher has tried to obtain the secondary information related to his study area from reference books, magazines, newspapers, scholarly articles, prior conducted researches etc. from the library.

**Government offices**

After selecting the area of study for research purpose, details like the geographical area, population of the village, infrastructural facilities in the village, number of farmers, irrigation area, water recovery, information related to rain, technical details of the plan, details of amendment plan of the scheme, maps of various kind of projects, details of the production in the
project area etc. was collected from gram panchayats, Taluka panchayat, district panchayat, irrigation department and state water data center office.

**Voluntary institution**

For research purpose, we have also relied on the internal report related to the work done with the farmers under the project, prepared by the voluntary institutions working in the project area.

**Other organization in the village**

Keeping in mind the objectives of the research, the researcher has also collected the data from the documents of the irrigation committee associated with the project as well as by utilizing accounted and non-accounted records. In addition to this, the information is also collected from the reports of the local milk committees.

**Internet**

Through the use of internet, researchers have tried to utilize prior conducted studies in research, information regarding water and irrigation of various states and countries, introduction of, taluka, districts and county, maps of the study area etc.

3.4 Data Analysis and Interpretation

Classification is a part of the detailed process of analysis. Until and unless the classification is done, it is not possible to identify and relate its various units. Tremendous information gathered by researchers is in the form of a raw complex data. No direct meaning can be extracted from it. Therefore to meaningfully interpret this information, it is essential to classify by corresponding it to the research issue. Coding of information basically comes under classification. Encoding is a process by which related diverse information is divided into sections or categories. To understand what the information says about the research issue, raw data is encoded and classified according to the groups. Through encoding the information is arranged in a manner suitable to the computer. Also the summary of this information is presented through charts and tables and interpretation of the same is done. Corresponding to the research subject, collected data is simplified and clarified through different process. To analyses the collected data for research purpose, it passes through the below given process:

**Classification of Data**

The process of grouping the collected data into various units according to their similarities and differences is known as classification. After editing the collected data, it is classified for analyzing the same. It is divided into two or more sections through classification process. Arranging the data in tabular form makes it easier for statistical analysis. In this way classification of the data proves to be useful for research purpose in various ways. It is also easy to remember the data through classification, as well as time and energy is also saved in understanding the data.
Tabulation
Tabulation is a technique to present the data with the help of which it is easily understood. If the data is ambiguous in classification, the table formation also becomes confusing. Here, it is tried to analyses by comparing two or more variants as required.

Comparison and Interpretation
After tabulation of the information, the degree/amount of answers to the questions is decided through classification of the collected elements and they are compared with each other. Therefore, on that basis the data is precisely and clearly interpreted.

Use of Computers
The present era is considered as the era of computers. The usage of computer is visible from small dairies of villages to big international companies and factories. Nowadays, computer has become an important instrument for various social research sectors in developed countries. In India also, computer is increasingly becoming a vital source for social research. To accelerate and to efficiently carry out the operations in various stages of their social research, government and non-government as well as many professional researchers have started making use of computers. SPSS software is used for the process of classification of data collected for research purpose.
Primary data received for the research report is entered in SPSS by defining the variables. Primary data is arranged in appropriate form, immaterial information is discarded and the required information is compiled. By doing this, analysis of the information and use of various statistical methods becomes easier. Tables are prepared to investigate the effect of various factors of the questions asked to the respondents, and interrelation among them is also tested. Analyses and interpretation of the results is also done.

Method of report writing
As the study presented here is totally descriptive, it is divided into different chapters, with the aim of making it more interesting. Concise information related to the study is provided in these chapters. Sub-chapters are provided in each chapters as well as tables and classification is presented wherever required.

3.5 Limitations of the study
It is difficult to maintain the neutrality, authenticity in social science studies as it is maintained in natural science research because social science is mainly related to human reactions. These human reactions are impulsive. In the same way the scope of social science studies are steady and difficult to measure specifically. Each coin has two sides. Similarly, this study also has its utilities as well as limitations. In relation to the collected information for the research undertaken, “Study of Participatory Irrigation Management (PIM) system and its impact on Sustainable development of Tribal Community” are able to achieve to some extent. Keeping in mind the decided objectives, efforts are made to provide information regarding the research study. Despite of this, according to the researcher, some limitations still appear in the research operations which are as follows:

- Samples collected for the study are limited.
- This research is conducted only for a project in the selected area of Mandvi Taluka.
- As the researcher is not a specialist in the research subject, it is possible that there are certain limitations or the subject is not fully explored.
- It is also possible that the respondents, who are farmers, have not answered appropriately for numerical questions or have provided false information which results in the possibility of error.