CHAPTER-I

INTRODUCTION

1.1 INTRODUCTION:-

The world’s water resources include the entire range of water that occurs on the earth. The oceans on the earth cover some 362 million km2 area and are the sink into which all water finally flows. World river run-off the rivers amounted to 2,30,000 cubic meters. A value that is about six or seven times greater than the currently accepted figure. During the past 200 years, the oceans cannot be considered primary resources for the direct water supply for domestic, agriculture or industrial use owing to their salt content. Scientists have devoted and estimated of world run-off ranging from 36,500 to 41,500 cubic meters. These estimates are probably too low, because of the run-off in a number of regions in Asia, Africa and South America and on Islands have been studied.

Rehabilitation of people for construction of dam is happened worldwide rehabilitation. The resettlement of people emerges the problem of rehabilitation. In order to accelerate the process of economic development and to promote balanced development of different regions, the government of India has launched many big development projects including river dams. However, the unintended consequences of all such development projects are involuntary displacement of human population, loss of forests and agricultural lands, which lead to pauperization of the displaced population.

The process of rehabilitation of people rehabilited because of the dam and other developed practice are changed from the process emerging by political and natural destruction. Problem of political and natural evidences is resolved to under taking fast provisional relief work before to the for stable rehabilitation are taken, but the rehabilitation arising from the construction of dams requires a calculated well-planned programme.
In the country various types of dams are constructed for irrigation and to generate hydro-electricity as per the demand. This dams are also useful for the irrigation of large agricultural lands, fisheries, for the fulfilment of the basic needs of villages. Due to this the people living in those settlements are uplifted from their roots. Akkalpada dam construct over the Panzara River. This is the major tributary of river Tapi. Akkalpada dam is few meter away from the village Akkalpada. This dam is constructed for the irrigation of the study area. A study area lie in ‘Drought Prone Zone’ of Maharashtra. This dam is very useful for agricultural development of the area. It is 32m. high, 1935m. Long, it has 17 gates. Akkalpada dam has right and left bank canal for the irrigation. It is economically useful for the development but affect on settlements like Vasamar, Tamasvadi and Sayyadnagar.

The settlements like Vasamar, Tamasvadi, and Sayyadnagar are fully rehabilitated due to Akkalpada dam backwater. These settlements disturbed not only his location but it affects on socio-economic structure, site, size, morphology and house types of settlements. It is very interesting to study the socio-economic structure, site, size, morphology and house types. Present study focused on changing phenomenon of the rehabilitated settlement due to Akkalpada dam.

The study of rural settlements has been one of the most significant themes of Human Geography. Several human geographers have also expressed studies in such areas like man-land relationship within the context of rural settlements.

Rural settlement geography has gained independent status in the recent years. In a broad sense the rural settlement, geography deals with the process of human occupancy of land, its arrangement, and grouping in the context of physical, socio-economic conditions of the study area.

The problem of human settlements has emerged as one of the most challenging issues particularly in the under developed countries of the world. About 65% of the world’s population lives in rural areas. As such, there is a need to study all the facts of rural habitat.

Rural settlements as a pioneer habitat of human being is a living and functional space. Rural settlement means a rural space occupied by rural community with their economic, social, and cultural environment. This environment influences the
entire rural way of life and their dynamic structure. Geographer looks at the rural settlements as agglomeration of manufactured habitat on the earth, dependent mostly on primary occupations.

India is a rural country where 75 percent population lives in the rural areas. The rural settlement in India from ancient period show as dominance of socio-economic factors in development. Hindu social organization, level of technology, the dominance of ‘Jajmani’ system and political instability are the important factors, which have given typical character to Indian village.

Since the country dominated by agrarian economy and most of the population is concentrated in villages, the study of rural settlements in India should be given prime importance. However, during the last twenty years many Indian Geographers have diverted their attention to the study of rural settlements. The present study is an attempt in this direction.

The precise reasons for the formation of settlements are not known. The events are shrouded in mystery, as they occurred before recorded history. There are only reasonable conjectures on where and why permanent settlements began. Before the domestication of plants and establishment of settlements, the human beings were nomads, wandering in tribes across the landscape in search of food and water. The available soil, water, forest and mineral resources closely influence the site, growth and development of settlements.

“The study of settlement is important to human geography because the form of settlement in any particular area reflects man’s relationship with the surroundings”. “The term settlement refers to the characteristic grouping of population into the occupancy units together with the facilities in the form of house and streets which serve the inhabitants. In other words settlement is an organized colony of human beings, including the buildings in which they live or work or store various things and tracks or streets over which their movement take place.” (Singh, 1975).

“The term settlement refers to the humanisation of the natural landscape by man, but in settlement geography, with some specific reservations, the settlement is generally defined as a cluster of houses including the surrounding lands usually grouped at a convenient site and generally without any formal plan.” (Singh, 1975).
Settlement geography comprises of two branches, one dealing with urban settlements and other with rural settlements. Settlements are numerous types and these may be classified based on occupation as rural and urban. Any settlement in which most people are engaged in agriculture, forestry, mining and fishery is known as rural settlement. A rural settlement is often been called as an agricultural workshop, while the settlements in which most of the people are engaged in secondary, tertiary and quaternary activities are known as urban settlements. In other words, urban relates cities and towns, and rural relates villages.

1.2 Nature of Settlements Geography:-

Settlement geography is the recently developed branch of human geography. Its study is basic to human geography, because the form of settlement in any particular region represents man’s relationship with the environment. “Settlement geography is the study of the form of the cultural landscape” (Jordan 1966). “It is a science of systematic inquiry of occupancy features distributed over space with differentiation in relation to man” (mandal 1978).

The term settlement geography is derived from the German word ‘siediungs geographie’ (singh, R.L. and Singh, K.N.1975), it means the cultural landscape developed by man in the process of occupancy.

“The term settlement refers to the characteristic grouping of population into occupancy units together with the facilities in the form of house and streets which serve the inhabitants. In other word, settlement is an organized colony of human beings, including the buildings in which they live or work or store various things and tracks or streets over which their movements take place” (singh R.L.1961).

According to R.B. singh, the term settlement refers to the humanisation of the natural landscape by man, but in settlement geography. The settlement is generally defined as cluster of houses including the surrounding lands usually grouped at a convenient site and generally without any formal plan.

Settlement geography comprises of two branches, one dealing with urban settlements and the other with rural settlements. “Rural settlement has been distinct
feature of the countryside since prehistoric times. It is the place of origin and primary residence of human society. A rural settlement is the linking thread and life blood of all geographical studies". (Kohn, 1959)

Many Europeans and other scholar have contributed substantially to this branch of geographical knowledge. Ritter (1779-1859) is the pioneer among geographer who studies the rural settlements. The history of systematic study of rural settlements, however, goes back to the beginning of the present century, when scholars like, Paul Vidal de le Blaches, Aurosseau, Ahlmann, Demangeon, B and others started laying foundation of the branches of settlement geography.

Different workers have tried to define the discipline rural settlements geography in different ways. According to Stone (1965), “rural settlement geography is the interpretation and analysis of the distribution of buildings by which people attach themselves to the land for the purpose of production”. This definition amounts to the exclusion of an examination of such phenomena as building materials, architectural styles, land uses and fence types etc. though these elements form a significant part of rural settlement geography.

The view of stone has been challenged by Jorden (1966), who defined the subject as, “the study of the form of the cultural landscape involving its orderly interpretation and attempted account. According to him, rural settlement geography focuses on three separate aspects of the cultural landscape:-

i) The settlement pattern or distribution of farmsteads.

ii) The field pattern or the form resulting from division of land for productive use.

iii) House and farmstead types including the building materials and folk “architecture”.

“In a broad sense, rural settlement geography deals with (i) the process of human occupance and (ii) its arrangement and groupings. It means the main thane of the study lies around settlement ensembles and their spatial patterns for analysing the sequence of change in the cultural landscape. In a more precise way, rural settlement geography is concerned with the orderly description and interpretation of processes, patterning, functions, and the spatial organization of human occupance within rural
environment over the earth’s surface. Like other branches of geography, the core concern of rural settlement geography is ‘space’ and sequence occupancy”. (Singh, R.L., and Singh K.N. 1975).

In nutshell, the rural settlement is a comparatively small and simple agglomerations of houses at a favourable and convenient site.

The census of India has more specifically defined the urban and rural settlements because of the following criteria:

For any place to be recognised as an urban place, according to the 1971 census, it was to have a municipality or a cantonment board. Every other place which had (i) a population more than 5000 (ii) more than three fourth of its male working population busy in industrial pursuits and (iii) a density of population of is 400 persons per sq.km. All other settlements, which do not satisfy these conditions, are treated as rural settlements.

Rural settlements show the impact of natural environment on them more clearly and directly. Although urban and rural settlements form two important components of settlements geography, their problems and methods of analysis are distinctly different. Urban geography has received more attention but in case of rural settlement geography, systematic and scientific analysis is still in the initial stages.

1.3 SIGNIFICANCE OF STUDY:-

The irrigation dams are constructed to increase irrigated land for agricultural production. Each dam requires large submerged area for reservoir, which creates involuntary displacement. The government concentrates on the completion of project but not on rehabilitation. The people, mostly from poorer sections, residing in the remote area have been deprived from their livelihood. They lose their sources of economic, social cultural and psychological life. They are thrown to the unknown locations in the command area where the geographical and socio-cultural situation is different. They face number of problems at new locations because the government authority neglects the responsibility of rehabilitation. Such thing is happened in case of the Akkalpada dam.
The problem of resettlement and rehabilitation is becoming such a widespread event that it is covering all corners of the developing as well as developed societies of the world.

The Akkalpada dam affected people resettled before 10 years ago still they are waiting for their benefits of rehabilitation. The researcher on this background has concentrated to find out the variation and intensity of problems as well as pre and post relocation of socio-economic status of rehabilitated people affected by Akkalpada dam.

The construction of dams helps to increase the agricultural production. The agriculture has been a major occupation of human being. It has been an age-old practice of man. Before, the Industrial Revolution, the requirement, of food was limited, due to the less number of populations. With increasing growth of the population, the need for food accelerated and man has been forced to adopt different technologies to multiply the rate of food production. The poor countries, which could not achieve the agriculture development, have been facing the problems like starvation, malnutrition, hunger etc. On the other hand, some countries, which adopted farm technologies succeeded in qualitative and quantitative and quantitative increase of food production.

Agriculture is the backbone of Indian economy, contributing 13.3 percent income from agriculture sector and 65 % of the total population depends upon it. However, the Indian agriculture, the gambled of mansoon has been remained at traditional subsistence level. Being the agriculture rain fed and uncertain, seasonal, irregular nature of mansoon rainfall, the needs for irrigation became a very essential elements. Irrigation attains the increase of food production, horizontal expansion of cultivation and socio-economic development of the region. With this view, during fifth year plan, particularly from Second fifth year Plan, the government of India paid more attention on construction of major, medium and minor irrigation projects.

The construction of dams, especially, major and medium, displace the people from their native places. However, central as well as state governments had neglected responsibility of rehabilitation. In some exceptional cases, states have made efforts in this direction. Some states made little efforts to formulate rules and laws of
rehabilitation. According to these rules and laws, displaced people had been provided with cash compensation and resettled at new locations.

There is lack of availability of reliable and accurate data about displacement and rehabilitation. In Northern part of Maharashtra and Dhule district have ideal locations for the construction of irrigation dams. The Dhule district presently has 12 medium and 09 minor irrigation projects at their various stages of completion. Under these projects, number of families have been displaced and rehabilitated at various locations. It is observed that the affected people of such irrigation projects have been fighting and agitating for their rights even after the completion of such projects.

Akkalpada Irrigation Project is one of the medium irrigation projects of Dhule district. The process of rehabilitation is still going on from last 15 years. This delay has affected the socio-economic status of rehabilitated people. These displaced people have been facing number of social, economic, cultural, political, psychological problems. This has attracted the attention of the investigator to study the various problems by these people. The present study, a micro level research work, analyzes the displacement and rehabilitation, socio-economic status and problems of rehabilitated people affected by Akkalpada Irrigation Project.

1.4 AIMS AND OBJECTIVES:-

The main object of the present study is to access impact of Akkalpada dam on rehabilitated settlements of study area.
1. To examine the impact of Akkalpada dam on settlements of study area.
2. To study the morphology, size, shape, pattern, site of the rehabilitee settlements of the study area.
3. To study the socio-economic structure of rehabilitated settlements.
4. To find out various socio-economic problems of the dam affected settlements.
5. To find out the socio-economic status of the villages to the construction of the project at present.
6. To Suggest suggestions for proper and effective rehabilitation.

1.5 HYPOTHESIS:-
For the present study, the hypothesis can be set as, “In the process of rehabilitation of dam affected settlements, both positive and negative changes have been occurred in the socio-economic aspects of such settlements.” Dam disturbed the agricultural and socio-economic setup as well as settlements of the catchment area.

1.6 METHODOLOGY:-

The present work would be carried out by using following methodology.

A. Literature survey.
B. Field work.

A. LITERATURE SURVEY:-

It is important to take an overview of literature available on this topic. Therefore, various libraries such as Deccan college Pane, Jackal Library Pane University, Pane, Dr. B.S. Ambedkar Marathwada University Aurangabad, NMU Jalgaon, Pratap College Amalner, S.S.V.P.S Science College Dhule, Z.B.College, Dhule, Kisan College, Parola, JITU, Rajasthan are referred. They require Literature is also collected from different journals, magazines, newspapers, books and websites.

For detailed study of various aspects of the problem “Geographical study of Rehabilitated Settlements of Akkalpada Dam (MS.)”, the secondary data has been collected from the following sources.

2. Research Journals on Settlement and Rehabilitation.
5. Data regarding temperature, rainfall, humidity, is collected from Agriculture College, Dhule.
6. For the preparation of basic map, the maps of Groundwater Survey and Development Agency (G.S.D.A.), Geological map of Study area, Toposheets of Survey of India were used.
7. Seminars, Conference and workshops organized at national and International level.

B. FIELD WORK:-

Intensive fieldwork is carried out in number of visits to complete this work. For this purpose number of sites were visited along riverbank, Settlements were also
visited to study the settlement patterns, types and house types of the study area. Questionnaires are filled for Socio-Economic review and Field visit to the Dam site and Settlements. The obtained data have been processed by adopting different method and techniques. A detected examination of SOI toposheet carried out for considering the different attitudes of study.

1.6 ARRANGEMENT OF THE TEXT:-

Present study will be divided into eight chapters.

Chapter –I

The first “Introduction” chapter give the importance of the present study. It also demarcates the area under study and explains the objectives, Hypothesis of the study and research methodology adopted for this work. It also throws light on Akkalpada dam.

Chapter –II

The Second chapter “Review of literature”. Its includes the study of related literature to the problems.

Chapter –III

The chapter third is “Geographical personality of the study region.” It throws light on physical, social and economical background of the region. In the physical background relief, climate, soil, Drainage, Geology, Natural vegetation is explained. In Socio-Economic review, the social and economical background of the study region is assessed. It includes distribution of population, population class wise distribution of rural settlements in study region, population density, population growth, scheduled caste population, scheduled tribe population, sex ratio, literacy, economic background, general landuse, area under irrigation, cropping pattern, crop production, transportation and tourism.

Chapter IV

While discussing socio-economic factors in rehabilitated villages these factors are also considered along with location of the study region. In the fourth chapter “Social status” the rehabilitated villages are undertaken, social changes that may taken place during the period of rehabilitees in the factors like social status, caste, family, population growth, sex ratio, literacy and educational attainment.
Chapter-Vth

“Morphology of rehabilitated villages” has been explained in the fifth chapter. In this chapter layout of the new and old villages and house types have been discussed.

Chapter- VIth

The sixth chapter “Case study” takes in to account of 03 rehabilited villages. It includes the location, size of land holding, land ownership, size of family, electric supply, water supply, amenities available in the rehabilited settlements are studied deeply.

Chapter – VIIth

The seven th chapter “Problems of rehabilited people” includes the impact of dam on livelihood, economy and occupation in the study area. It also throws light on problem of rehabilited people.

Chapter – VIIIth

The last chapter will be the “Summary, Conclusion, Suggestions and Limitations” of the study. It is followed by questionnaires, references and published research paper.

1.8 IMPORTANCE OF WATER:-

Water is very important next to the oxygen, within water presence of life on earth is impossible. The earliest stirrings of life began in water and even though some forms have strayed away to be sustained on land, water is essential for their survival for instance, the human body contains two-thirds water and every day one must replace 5 percent of it.

Water is the internal medium for almost all organisms and principal external medium for several organisms. In most organisms with including man 70% body weight, consist water. Since it is one of the constituents in the reaction of photosynthesis, which captures energy from the sun, it is also an important substance in directing the energy flow in the living systems. It is true that life on the earth is possible only due to present of water on the earth.

Water has its own quality to dissolving substances, without changing their chemical characterise, so water plays on important role to transfer material in the body.
Blood is mostly water through which food and oxygen is supplied to the cells. Waste products from the body are removed in the dissolved state with water. The substance is present in all the three states of matter; i.e. gasses, liquid and solid within the range of temperature and pressure common to the earth. Approximately 97% of the total water exists in gigantic oceans. This water is of little importance in our daily requirement remaining 3% water is distributed in the form of ice sheets, underground, atmosphere, lakes, rivers, biological water contained in the living organisms. The surface freshwater in form of lakes and rivers is hardly 0.05% of total water are mostly for freshwater; we have to depend mainly on the time fraction of the total water present on this planet.

Water is essential for the life on earth. It is a basic resource as well as necessary for plants, animal, and human beings. They cannot survive without water. According to its distribution and availability, water resource may be broadly classed as: Underground water and Surface water (Singh2007). 97 percent of earth’s water is found in ocean; 2 percent is frozen in poles etc. and remaining 1 percent is available to us in the fresh water in river, lakes and ground water which is useful for human beings for their daily needs, irrigation and industries (Kudesia1988).

India has plenty of water. The subcontinent receives most of its water during monsoon month (almost 75%) Rest of the month which necessities the use of ground water or stored water during the dry spells. The uneven distribution of rains in different months of the year is matched by its equally uneven distribution over different region of the country. Part of Rajasthan receives very little rains. Table no 1.1 gives information about run-off water in the different parts of the Earth.

Table no 1.1 shows distribution of run-off water for different parts on the earth. The total run-off water on the is 41520 km$^3$ in which Asia has largest run-off water is 10560 km$^3$ because Asia has large continent on the planet and maximum area under snow covered and situated in equator. The second largest is the South America due to its maximum area lies on the equator and world largest river Amazon flows in Brazil. After South America follows the Island on earth such as Shrilanka, New Zealand, Madagascar etc. After Islands North America is total water run-off is 5950 km$^3$ because Northern parts of North America is snow covered and Rookies Mountain lactated on Western side of the continent.
Table No. 1.

The distribution of run-off water for different parts of the Earth.

<table>
<thead>
<tr>
<th>Continents and Islands</th>
<th>Distribution of Run-off / River run-off</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Layer (mm)</td>
<td>Volume (cubic Km)</td>
</tr>
<tr>
<td>Europe</td>
<td>299</td>
<td>2,920</td>
</tr>
<tr>
<td>Asia</td>
<td>259</td>
<td>10,560</td>
</tr>
<tr>
<td>North America</td>
<td>296</td>
<td>5,950</td>
</tr>
<tr>
<td>South America</td>
<td>534</td>
<td>9,420</td>
</tr>
<tr>
<td>Africa</td>
<td>148</td>
<td>4,360</td>
</tr>
<tr>
<td>Australia</td>
<td>42</td>
<td>320</td>
</tr>
<tr>
<td>Antarctica</td>
<td>80</td>
<td>1,060</td>
</tr>
<tr>
<td>Islands</td>
<td>--</td>
<td>6,930</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>41,520</td>
</tr>
</tbody>
</table>

Source- Encyclopaedia

After north America the Africa has total water run-off is 4360 km$^3$ because it is a large continent but maximum area lies on the desert such Sahara desert located on the northern part of the continent and Kalhari desert locate on the southern part of the continent.

After Africa Europe (2920km$^3$). Antarctica (1060km$^3$) and Australia respectively.

1.8.1 Concept of water resource:-

Water is raised from the ocean diffused through the air and poured down upon the soil with assorted qualifying world denoting kind of water distinguished by their properties or source; see. Ice water, rainwater, snow water, spring water, sweet water, cold water, hot water.

i) “Water of a mineral spring or a collection of mineral springs used medicinally for bathing or for drinking or bath”.
ii) “Today, according to chemistry, water is a compound consisting different volumes Hydrogen and Oxygen. In pre-scientific Chemistry, it is 1/5 elements of which all bodies are composed”.

iii) “The colourless, visible liquid occurring on earth as rivers, lakes oceans etc. And failing from the clods as rain. Chemically a compound of hydrogen and oxygen H$_2$O freezes, forming ice at 0°C (32°F) and boils, forming steam at 100°C (212°F)”.

iv) “Water, as a river, lake or sea, the part of sea continuous with specified county, land mass etc or the parts away from this (international water) any area in a belly of water (the body still waters).

1.8.2 Nature of water resource:-

As mentioned earlier, water resource is an interdisciplinary subject and therefore requires knowledge of different disciplines. It deals mainly with macro level problems and therefore knowledge of macro-economic theory is essential for water resources. Moreover, since a water resource has to apply macro-economic principals to the problem growing out of the natural environment, a working knowledge of the biophysical structure and the functional performance of that environment is required. An understanding of the structure and functional relations among socio-cultural, legal government and psychological parameters impinging on man behaviour relative to his water resources. Since water resources deal with time related problems and involves a benefit-cost analysis.

Any comprehensive programs of water resource development require the preparation of detailed and precise system of resource utilization, an analysis of the cultural and physical obstacles in the path of water resource development. The extent to which available natural resource may be economically exploited has also to be determined and a rational choice between several present and future used of these water resources has to be made for this purpose.

Our environment usually centres on water in reality water makes up our living world. In this situation, all attempts are require showing constructive respect to water. A great phenomenon of water rush is being witnessed everywhere with growing population. Water problems are likely to give rise to skirmishes, quarrels and organised attempts for mastering water source areas. Beside it is now threatened with misuse and
pollution. Rainwater stored across terrain as occur in cyclical order. It is time for taking meticulous care of our water resources through proper use and conserve replenish and recharge it for future requirements.

1.8.3 Scope of water resource:-

There have rapid development in the field of water resource. Although emphasis has been laid on water resource and water quality planning, an integrated water resource environmental, looking at both the qualitative and quantitative aspects simultaneously generally has been adopted in past.

Special issue follow, ground water is an integral part of water resources and conjunctive planning is considered mandatory but certain issue require. Special analysis and these have been specifically taken. Water resources development is multipurpose but very often some issue are dominant and many also integrated with other technological activities for instance, even when hydroelectric development had been conjunct.

Water resources planning in the context of energy sectored planning has also to be considered. Similarly, there are some specific systems. Functional issues of flood, navigation, micro level planning. Water resources planning are carried out at two levels. At one end have national regional or river basin planning. Due to explosive activity in water resource management, the literature of water resources system analysis, environmental systems, in general has grown rapidly of late. The presentation in a text even though research oriented, can be selective.

The various components of demand and their evolution of studied. The agriculture demand, being complex and accounting for a major component water diversion and use is studied. The planning of the various elements of a water project one investigated. These are storage, conjunctive, surface, and ground water. Deterministic and stochastic planning have been dealt with separately. There are several further inter linkages. Water resource projects or programs constituting the elements. The development of an important resource such as water may involve the simultaneous planning.

Water resource development will depend upon developmental policies, population levels, economic framework and policies, availability of water resources and
sectored developmental policies. All these factors are embedded in the regional development. The surface subsurface water interaction is dynamic and as development takes places in view of the particular hydro-geologic environment, beside surface storage, it is possible to undertake ground water recharge has to be modelled. Quality studies and quantity studies are interrelated and have to be integrally modelled carried out water resources developmental studies.

1.9 DAMS IN STUDY AREA:-

Table No.1.2 shows 12 medium irrigation projects in the Dhule districts in which five projects in Sakri Tahsil, four in Shindkheda tahsil, two in Shirpur tahsil and one in Dhule tahsil. Sakri tahsil has maximum area acquire in Dhule district and there large no of medium irrigation project in Sakri tahsil. The 12 medium irrigation projects covered 87255 hectors total geographical area of the district. Which total water storage capacity of the district in 473.904 Mcum.

The above table shows 12 medium irrigation projects situated in Dhule district. In which Nimnpanzara Medium irrigation project (109.314 Mcum) has large storage capacity while Panzara medium irrigation project has large catchment area. The storage capacity of irrigation project in aspect to their capacity as the Nimnpanzar irrigation project has high storage capacity, Aner, Sulwade, Panzara, wadishewadi. Amaravati, Karvand, sonwad, Burai, Jamkhedi, Malangaon and Kanoli. The catchment areas of irrigation project are different. The high catchment area covered by panzara irrigation ( 16093 H ) Project in Sakri Tahsil and remaining are Nimnpanzara, Wadishewadi, Sulwade, Aner, Karvand, Jamkhedi, Burai, Amaravati, Malangaon and Kanoli.

**Table No. 1.2**

Medium Irrigation Projects in Dhule district.

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of medium irrigation projects</th>
<th>Name of the Tehasil</th>
<th>Catchment area in Hectar</th>
<th>Capacity in Mcum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Amravati, Shindkheda</td>
<td>4094</td>
<td>27.78</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Nimnpanzara Sakri</td>
<td>12519</td>
<td>109.314</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Wadishewadi Shindkheda</td>
<td>9636</td>
<td>36.93</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sulwade barrage Shindkheda</td>
<td>9333</td>
<td>65.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Location</td>
<td>District</td>
<td>Population</td>
<td>Water Capacity</td>
</tr>
<tr>
<td>---</td>
<td>--------------</td>
<td>------------</td>
<td>------------</td>
<td>----------------</td>
</tr>
<tr>
<td>5</td>
<td>Aner Shirpur</td>
<td>Shirpur</td>
<td>8813</td>
<td>103.56</td>
</tr>
<tr>
<td>6</td>
<td>Karvand Shirpur</td>
<td>Shirpur</td>
<td>8266</td>
<td>21.12</td>
</tr>
<tr>
<td>7</td>
<td>Panzara Sakri</td>
<td>Sakri</td>
<td>16093</td>
<td>43.42</td>
</tr>
<tr>
<td>8</td>
<td>Malangaon Sakri</td>
<td>Sakri</td>
<td>2877</td>
<td>13.03</td>
</tr>
<tr>
<td>9</td>
<td>Burai Sakri</td>
<td>Sakri</td>
<td>4520</td>
<td>14.21</td>
</tr>
<tr>
<td>10</td>
<td>Kanoli Dhule</td>
<td>Dhule</td>
<td>1620</td>
<td>11.90</td>
</tr>
<tr>
<td>11</td>
<td>Jamkhedi Sakri</td>
<td>Sakri</td>
<td>7032</td>
<td>13.28</td>
</tr>
<tr>
<td>12</td>
<td>Sonvad Shindkheda</td>
<td>Shindkheda</td>
<td>2452</td>
<td>14.30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>87255</td>
<td>473.904</td>
</tr>
</tbody>
</table>

**Source: Irrigation Department, Dhule**

**1.10 AKKALPADA DAM:-**

In Dhule district, there are 12 Medium Projects and 47 Minor Irrigation Projects. By the medium irrigation project, the water capacity status is 473.904 Mcum water availability and 47 Minor Irrigation Projects water capacity 126.62 Mcum water availability. This water utilization helps agriculture, industrial and domestic purpose. The site of catchment area finds another source of water availability.

Panzara medium project construct over the River Panzara. This is the major left tributary of river Tapi. Panzara medium project is few meter away from the village Akkalpada. This project is constructed for irrigation of the study area. A study area lies in ‘Drought Prone Zone’ of Maharashtra. This dam is very useful for agricultural as well as industrial development of the study area. It is 32 M high and 1935 M long it has 17 gates. Panzara medium project has right and left bank canal for the irrigation. It is economically useful for the development but affect on settlements like Vasamar, Tamasvadi and Sayyadnagar.

The settlements like Vasamar, Tamasvadi and Sayyadnagar are fully rehabilited due to Panzara medium project backwater. These settlements disturbed not only his location but it affects on socio-economic structure, site, size, morphology and house types of settlements. It is very interesting to study the socio-economic structure, site, size, morphology and house types. Present study focused on changing phenomenon of the rehabilitated settlement due to Panzara medium project.
The selection of Panzara medium project for the present study is not arbitrary. Panzara medium project is the medium project in Dhule district, by which Vasamar, Sayyadnagar, Tamaswadi villages are displaced, (Fig.1.1) which create many serious problems of rehabilitation. The geographical location of the project is 74° 27' 22" E Longitude and 20° 56' 22" N Latitude.

The lower part of the project has been benefited by the cannel irrigation, but what is the condition of the villages located in the upper part of the project? Keeping this view in mind, in the present study an attempt is made to understand the present condition of project affected villages. It has been observed that out of three project-affected villages, the work of rehabilitation has been completed in two villages and remaining Sayyadnagar is not still rehabilited. The formers of this village are deadly reluctant in handling over there agricultural land to the government. This has created more difficulties in the work of rehabilitation.

Project in Brief:-

The location of project is on river Panzara which is the tributary of river Tapi in the study region of Dhule district.

The project comprises construction of the following components.

- It is 3266 m long and height is about 31.18 m central 259 m long gated ogee type spillway across river Panzara a tributary of river Tapi, near village Akkalpada in Sakri Tahsil of district Dhule it’s storage is 103.314Mm³.

LOCATION OF AKKALPADA DAM
Fig. No. 1.1

- Curve shaped having 17 radial gates of size 12m x 8m each to pass excess water of 11550 m$^3$/s.
- 32.85km long Bank Canal (LBC) benefiting 16 villages in Sakri and Dhule Tahsil Of Dhule district along with DISNET, 14.13 km long Right Bank Canal (RBC) benefiting 6 villages in Dhule Tahsil of Dhule district along with DISNET.
- Estimated cost and year of approval and target date of completion:-

  Government of Maharashtra had accorded original administrative approval for the project in January 1984 for Rs.20.6760 Core. Tapi Irrigation Development Corporation accorded the revised administrative approval in April 1999 for Rs. 131.4019 Core.

  The government of Maharashtra according 2$^{nd}$ revised administrative approval of Rs. 347.3107 Core at 2005-06 price level, in March 2008 which was approved by technical advisory committee (TAC) of MoWR in February 2009.
However, GOM has informed that the estimate is further under revision. The proposed revised construction cost of the dam is Rs. 556.286 crore (Rs. 476.204 crore and estimate. - Rs 80.082 crore) at price level 2011-2012. The proposed cost of AIBP component is Rs. 300.6035 crore. This revised cost has been approved by State TAC and is at present under scrutiny at GOM level. After
state clearance, the revised estimate is required to be submitted for clearance of TAC of MOWR and investment clearance of planning commission.

Photo No.1.3

Akkalpada Dam Right Canal

As per the investment clearance by planning commission, New Delhi accorded on 01.04.2009 the project was scheduled to be completed by March 2011. However, the proposal for extension for time for completion of the project up to March 2017 submitted to planning commission by project authorities.

The Project Benefits:-

The project affords benefits in two ways: Providing perennial irrigation through direct canals from storage and Supplementing water for the command of the both left and right canal including its extension for irrigation of seasonal crops.

Socio-economic aspect:

The project affords benefit to Sakri and Dhule tahsil of Dhule district and population benefited from command of both direct canals. People from the command of direct canals are already irrigation minded and in order to get optimum benefit from
sugarcane crop, there is a proposal in an advanced stage for starting a co-operative sugar factory between Sakri and Dhule.

**Table No. 1.3**

**Status of works (Physical Progress)**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of Work</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eastern Dam</td>
<td>95% earth Work completed</td>
</tr>
<tr>
<td>2</td>
<td>Spillway</td>
<td>95% work completed storage created up to crest R.L 377.515 m of about 40.53 mm³</td>
</tr>
<tr>
<td>3</td>
<td>Gate Erection</td>
<td>98% Completed</td>
</tr>
<tr>
<td>4</td>
<td>Irrigation Outlet</td>
<td>100% completed</td>
</tr>
<tr>
<td>5</td>
<td>Right Bank Canal and Distribution work</td>
<td>100% Completed</td>
</tr>
<tr>
<td>6</td>
<td>Left Bank Canal and Distribution work</td>
<td>Main canal 70% completed and distribution 60% completed</td>
</tr>
<tr>
<td>7</td>
<td>Rehabilitation (03 Villages)</td>
<td>100% Plot allotted to PAP’s, out of 18 civic amenities 15 are completed</td>
</tr>
<tr>
<td>8</td>
<td>Displacement of Ousters new Gaothan</td>
<td>Vasmar 100%, Sayyadnagar 80%, and Tamawadi 100%</td>
</tr>
<tr>
<td>9</td>
<td>Land Acquisition</td>
<td>100% acquisition completed for Headwork and RBC, remaining in progress</td>
</tr>
</tbody>
</table>

**Source:** - Lower Panzara Irrigation Project

At present there a number of power crushers in the tract. The project when implemenated will definitely help further progress towards such agro industrial activities.

**Availability of Water:-**
The Akkalpada dam is 1935 m long and maximum 32 meter high. It was constructed with the help of soil and cement. This project is located at Eastern side of Sakri tahsil. It is useful for agricultural development of tahsil. An irrigation project built up on the river Panzara i.e. left canal and right canal. The capacity of water storage of this project has 109.314 Mcum. Akkalpada project has been providing irrigation to 12618-hector land. Project is fall in drought prone in area. This project is useful for agricultural irrigation in drought prone area of the district.

Utility of Water:-

The water level of the medium projects is taken into consideration on 15th Oct. Water utilization of this medium irrigation projects are decided on the basis of water availability in that particular season. This seasons wise categorization done by Irrigation Department. It is as follow:

1. Kharip season 106 days
2. Rabbi season for 137 days
3. Hot weather season 122 days.

1.11 Magnitude of human displacement:-

No doubt all those major and medium irrigation projects are designed to provide perennial irrigation to develop the agricultural economy, generation of hydro-electricity, and to supply drinking water and the like. However, while all these positive aspects of development are associated with these large irrigation and hydel dams, the same process also displaces a large number of people and puts presser on the ecosystem due to submergence of forests and cultivable lands. According to estimation of a study made on dams and displacement, a major dam on an average displaces 40,000 people and the average rate of displacement caused due to medium irrigation project is around 5000 people per project. On this basis, here we make an attempt to estimate the number of people displaced due to large and medium irrigation projects in the country during First plan to Seventh plan. It is found that by end of the seventh five year plan (1985-90), there were 81 major dams and 777 medium irrigation projects of completed nature. This means the big dam alone must have displaced around 32.40 lakh human population and the number of people displaced due to completed irrigation projects till 1990, is around 338.85 lakh. Thus by 1990 the total number of human
population displaced due to large and medium dams was around 71.25 lakh. Further at the time of commencement of the country’s Eight plan, there were 157 major and 228 medium irrigation projects found in their ongoing stage and on their completion, those might lead to further displacement of around 74.20 lakh human population. All these together comes to 145.45 lakh, which is roughly 1.74 per cent of the country’s total population according to 1991 census.

However, it may be mentioned here that the above estimation of involuntary displacement of human population due to river dam projects is based on lower end of the scale and actual displacement figure might be much more than the estimated figure.

Development induced displacement and protest movements:-

Involuntary displacement of human population caused due to building of large dams have become a burning issue of the day and the country has witnessed to several protest movements of displaced people with moral support from environmentalists and social activities against many development projects that lead to massive displacement of human population, submergence of forest and agricultural lands. The ongoing movements of people against the Narmada Valley project Madhya Pradesh, Tehri dam project in Uttar Pradesh, BALCO (Bharat Aluminium Company), mining projects, and Baliapal rocket launching project in Orissa and Koel-Kero hydro-electricity project in Bihar are quite well-known. Even in the past of outees of Hirakud dam, Rourkela steel project, NALCO (National Aluminium Company), Rengali dam project, Upper indravti projects and displaced people in various mines and industrial areas of Orissa had fought against the location of these projects in their respective regions. The main reasons for such protects were apprehension for (i) loss of livelihood, (ii) destruction of social fabric and loss of existing community life, (iii) inadequate compensation measures, (iv) occupational shift and displacement (v) improper rehabilitation measures by the Government and the like.

Displacement Effects:-

A large number of studies relating to displacement aspect of development projects in India and other foreign countries focus on human problems associated with involuntary displacement such as the complex social and cultural problems inherent in
the resettlement process, poorly managed resettlement resulting in increased poverty, the labyrinth of broken communities, broken families, loss of social ties, destruction of life supporting system, ecological disorder and the like. Some of the studies equivocally argue that the oustees do not get fair treatment when they are asked to vacate their own land. Their relatively weak and subordinate position in the Indian social hierarchy imply that they have little political or economic bargaining power vis-a-vis other interest groups. A large majority of oustees of development projects in the country belongs to lower social economic strata and they have little political clout or access to national resources. Resettlement results in serious decline and deterioration of socio-economic conditions of the oustees. A study of Sri Sailam project oustees by the Centre for scientific and environment, New Delhi in early 1980 revealed that 81 per cent of sample respondents were from scheduled castes, schedules tribe, and backward castes background and their debt burden was found to have increased mechanism of resettlement measures failed to restore the previous income and land holding size of the relocated families. The study by Lokayan further showed that land holding size of all categories of oustees reduce between 53 to 63 per cent during the – relocation period. Even the studies of Hirakud dam studies clearly show that after long years of their resettlement in different localities the oustees have largely failed to build-up their lost socio-economic status and vivid community life of yester years. They are yet to overcome the socio-cultural shock and many of them are yet to be property integrated with the socio-cultural milieu of the host population in their region of relocation.

Development Displacement Debate:-

In fact all the development related displacement studies and the international debate on involuntary resettlement centre on both positive and negative attitudes. One section, denies in principal, the acceptability of any involuntary resettlement and it questions such development and legitimacy of the project which leads to massive displacement of human population and submergence or loss of forests and agricultural lands. At the other end, the other section while it is not very averse to the commissioning of large development projects causing massive involuntary displacement, it criticises the quality of specific resettlement operations.
1.12 Need of the study:-

It may be mentioned here that most of the development, displacement studies as discussed earlier, have vaguely focussed on deteriorating living condition and pauperisation of the oustees, unhappy experience of resettlement and rehabilitation relating to supply of basic civic amenities, facility and opportunity for earning a livelihood, loss of community life, break of kinship ties and above all hardship life due to un congenial environment under foreign ecosystem. The findings of such studies are mainly based on impressionistic observation of resettlement area and generation qualitative information by holding informal discussion and interviews of the displaced people in project affected region. This provides a clue to the critiques championing the cause of present development strategy to charge the other section as reactionary, feudal, and antidevelopment people. They say, there is a tendency among the common mass to always glorify the past notwithstanding several forms of socio-economic hardship and stifled community life. It is very difficult to make an objective assessment of the socio-economic condition of project-affected people in their new place of rehabilitation and resettlement by relying on such less scientific research method. More so, the study of socio-economic conditions of project-affected people in their initial years of rehabilitation and the study of the same people after a few more years of rehabilitation may provide a different picture altogether. According to them, in the early years of planning and setting up of many large development projects in India, the displaced people suffered a lot due lack of proper rehabilitation policy, mass illiteracy and lack of consciousness among people. However, in recent years due to increasing public consciousness and governmental concern towards the problems of massive involuntary displacement, all possible measures are now being made by the project authority to cause little damage to living condition and social, economic, cultural as well as religious life of the oustees. Hence, it is felt that by adopting holistic approach and by generating both quantitative data on past and present life of project oustees with the help of structured questionnaire and schedules and by following scientific sampling method, a more reliable study on present development project and its displacement effects can be carried out for the evolution of a successful rehabilitation and
resettlement policy measures for a vast, heterogeneous and highly populated country like India.

It is needless to mention that Orissa is one of the most backward states of India, notwithstanding its rich natural resources. Since the day of commencement of the country’s Five Year Plan the state has gone for the setting up of large development projects in the field of infrastructure and industries such as many multi-purpose river dam projects like Hirakud, Rengali, Upper Kolab, Indravati, etc. and large key sector industries like Rourkela steel plant, National Aluminium company at Angul and Damanjodi, mig aeronautics factory at sunabeda and the like under the initiative of central government to accelerate the pace of economic development. However, it is found that besides their controversial role in economic development the location of such projects in the backward regions of the state has resulted in massive involuntary displacement of poor and weaker sections. The finding of many studies relating to displacement and rehabilitation of the oustees in new as well as old resettlement areas provide a dismal picture. All these studies point out that the level of compensation paid to the oustees was highly inadequate and the rehabilitation measures were too ad hok and shortsighted to restore or improve the former living condition of the oustees in project areas.

However, as mentioned earlier, most of these studies due to their sociological and anthropological orientation fail to provide an accurate socio-economic picture of the oustees in their former settlement areas vis-a-vis the present resettlement areas. They fail to account for the living condition of the oustees in quantitative form to measure degree of change either in positive or negative direction. Moreover, there is a change in the rehabilitation policy and resettlement efforts of the government for project affected people in recent years, especially since 1980s. In the early fifties and sixties due to ad hoc policy measures rehabilitation could not be carried out in desired direction.

Notwithstanding this, it did not become a serious national issue in the 1950s and 60s because the country was first beginning its journey towards the path of modern development and there was relatively less pressure of population on land and
Development displacement became a serious national issue from 1970s onwards because the capitalist development path led to growing inequality between people and regions and the oustees got little scope to revive/improve their living new resettlement areas due to acute economic competition in a scenario of low growth. So, in order to get a better and scientific view of development displacement effects and the degree of success/failure of rehabilitation policy measures in contemporary India, the present study makes an attempt to study the impact of Rengali Multi-purpose River Dam Project upon the living condition of dam displacement people of undivided Sambalpur and Dhenkanal district of Orissa.

It may be mentioned here that the Rengali Dam is constructed over the river Brahmani, the second largest river of Orissa with a view to control flood, generate hydro-electricity and provide perennial irrigation facility to the drought prone area of Dhenkanal, Keonjher and Cuttack districts located downstream of the water reservoir.

1.13 Environmental and Ecosystem Impact on Dams:-

It is clear that project creates irreparable input on environment it create complex and multiple negate manmade later affects on ecosystem and its associated futures, it causes changes in flow. It also changes the temperature chemistry, algae micro communities and disturbing the resident of fish society. It changes the diversity of physical habitats. Rivers are vertically linked systems with process occurring in the upper reaches effects on downstream reaches. In addition, processes occurring in the downstream reaches can affect upstream reaches as denoted by biophysical legacies. The disturbance of these linkages by represents a significant disturbance to the entire ecosystem.

1.13.1 Effects of the Barrier Caused by the Dam:-

- The dams causes the suspended particles to settle, thereby limiting its storage capacity and at the same time limits, the flow of sediments downstream, which hampers agricultural activities of floodplains owing to limited nutrient-rich sediments. Decreased load of sediments carried by the river will cause scouring of the riverbed downstream.
Disruption to species migration in the river.

Increased amphibian and bird numbers and changes in patterns of faunal migration, disruption in habitats.

Entrapment of nutrients in the dam can lead to high eutrophication and subsequent excessive growth of aquatic weeds.

Deterioration of the water quality due to decomposition of flora and fauna, population from improved human activity including agriculture, recreation, and industries.

1.13.2 Alteration of the Natural Flow Patterns of Rivers:-

Impoundment by the reservoir will increase the water velocity immediately below the dam, reduce peak river flows, increase low flows, and eliminate the annual cycle of the discharge previously governed primarily by climatic factors.

- Effect of quantity of water necessary to maintain the downstream biological activity, changes in floral and faunal community downstream, loss of wetlands.
- Growth scouring of riverbeds downstream and bed degradation increased coastal erosion.
- Changes in water quality downstream including physical characterise.
- Narrowing of river channels and becoming overrun with vegetation.
- Minimise natural submergence for flood recession agriculture, reduction in ground water reached and less removal of parasites by natural flooding.
- Saltwater intrusion in estuary and further upstream and modification of the salinity balance in coastal regions, which alters the species distribution and production.
- Reduced soil fertility and Stalinization of floodplains.
- Disruption of spawning beds in shallow areas.

1.13.3 Indirect Effects Of Reservoirs:-

- Negative environments effects due to construction activities.
- Habitat loss due to deluge or flood.
- Environmental degradation due to growing human activities like intensive agriculture industries and increased pressure on lands.
- Alteration of tectonic activity changes in water tablets- higher around the reservoir and lowers downstream.
1.14 Social impact Assessment:-

Whenever it is desired to take on a new project or extension of an existing project, which involves involuntary dislocation of four hundred or more families enmass in plain areas, or two hundred or more families en mass in tribal or hilly areas, DDP blocks or areas mentioned in the scheduled V or Scheduled VI to constitution, the appropriate government shall ensure that a Social Impact Assessment (SIA) study is carried out in the proposed affected areas in such manner as may be prescribed.

The above SIA report shall be prepared in such Performa as may be prescribed, consider different alternatives and using agencies accredited in the manner prescribed.

While undertaking a social impact assessment the ruling government shall, interalia take into thought the impact that the project will have on public and community properties, assets and infrastructure, mainly, roads, public transport, drainage, sanitation, sources of safe drinking water, sources of drinking water for cattle, community ponds, grazing land, plantations, free toilets, such as post office, fair price shops etc. food storage godowns, electricity supply, health care facilities, schools and educational/training amenities, places of worship, land for traditional tribal institutions, burial and cremation grounds etc.

The proper government may specify that the ameliorative measures, which will require to be undertaken for addressing the said impact for a factor may not be less than what is provided in a scheme or programme if any of the central government or state government in operation in that area.

Here it is necessary as per the provisions of any law, rules, policy or guidelines to undertake environmental impact assessment also the SIA study shall be carried out simultaneously with the Environmental Impact Assessment (EIA) study.

In case where both EIA and SIA are required, the public hearing done in the project-affected area for EIA shall also cover issues connected to SIA. Such public hearing shall be organised by the appropriate government.
Where there is no need for EIA, the SIA report shall be made available to the public through public hearing to be organised by the ruling government in the project area.

An independent multi-disciplinary expert group constituted for the purpose by the appropriate government shall examine the SIA report. Two non-official social science and rehabilitation experts, the Secretary/secretaries of the departments concerned with the welfare of S.C. and S.T. of the appropriate government or his representatives, and a representative of requiring body shall be nominated by the appropriate government to serve on this expert group.

Where both EIA and SIA are necessary, a copy of the SIA report shall be made available to the agency prescribed in respect of environmental impact assessment by the Ministry of Environment and Forests and a copy of the EIA report shall be discussed with the expert group.

The SIA clearance shall be accorded as per the procedure and within the time limits as may be prescribed.

The SIA clearance shall be compulsory for all projects involving involuntary displacement of 400 or more families enmass in plain areas or 200 or more families en mass in tribal or hilly areas, DDP blocks or areas mentioned in the scheduled V or Scheduled VI to the constitution and the conditions laid down in the SIA clearance shall be duly followed by all related.

The Defence ministry, in respect of projects involving emergency acquisition of minimum area of land in connection with national security may be exempted from the provisions of this chapter with due institutional safety as may be prescribed for preserved the interests of the affected families and achieving the broad objectives of this policy

1.15 Socio-economic impacts of Dams:-

Big dams have large impacts for people’s lives and livelihoods, which include controversial issues such as displacement and resettlement. The opponents, of
dam construction argue that the social and economic consequences if big dams are more far-reaching than those associated with other infrastructure projects because of the large effects across time and space in both the ecosystem and in socio-economic and cultural structures. The impacts, both positive and negative, can be better notified in connection with the dam project cycle.

1.15.1 Pre-construction:-

The planning stage of dam, whether construction proceeds or not, can take several years and may district investors away from the area proposed to be filled, thus depriving the community of any developmental activities. In additional the psychological stress widespread among the communities because of the imminent loss of their assets, the uncertainty and insecurity of the future, can be a real traumatic experience for the would-be resettles’. Although these issues cannot be quantified; social as well as the economic implications are important.

1.15.2 Involuntary Resettlement:-

According to the World Bank, forced population displacement caused by dam construction is the single most serious counter developmental social consequence of water resources development. The displacement toll of the 300 big dams that, on common, enter in to construction every year is estimated to be above four million people, with at least 40 million so relocated over the past two decades. The social cost of involuntary resettlement varies greatly between projects, however, a uneven number odd outages are tribal or landless people who in many instance ewer resettled with force and violence, the trauma of resettlement can devastating as a result of weekend or dismantled social networks and life sustain mechanism, thereby leading to loss of their capacity to self manage. With extensive comparative analysis of resettlement issues related to dam construction, Cernea (1990) has identified eight risks that lead to social impoverishment: landless, joblessness, homelessness, marginalization, increased morbidity, food insecurity, the loss of access to common property and social disarticulation. Scudder (1997) has added a ninth risk, which is the loss of resiliency.

However, resettlement can have positive impacts if well planned, but this takes time. Usually the second generation of the displaced community can realize the
benefits of a successful resettlement with better utilization of the resources available to them. If such communities are relocated with adequate compensation, new economic opportunities, and social benefits, they can exploit the new circumstances as a chance to strengthen their income – earning capacity and thus their living standards. The new settlement may provide upgraded infrastructure facilities and reduced exposure to natural hazards.

1.15.3 Construction:-

Reservoir construction projects demand huge amounts of skilled and unskilled workers, which can benefit the adjoining society. Although many of the dam construction projects promise to provide employment opportunities for local people, they often tend to be a minority of the labour force. For example, in Saguling Dam in Indonesia, not more than twenty-five resettlers were employed, and in James Bay projects in Quebec, less than 5% of the labour force were Cree Indians. Most of the local people seldom have the skills necessary by the constrictors. Crash training programs seldom bring skills up to the needed standards. Moreover, contractors bring their own labour with previous construction experience; for example, on completion of Gazebo Dam in China of the 40,000 workers are likely to join the Three Gorges Dam project. Opportunities also arise in material supplies and small scale businesses that cater for the new community; however, there is a possibility that such construction towns become “ghost-cities” after the construction is complete.

1.15.4 Post-Construction:-

The newly developed reservoir can support lots of economic activities that generate service for both local people and immigrants. However, the changes in the downstream flow patterns can badly disrupt economic activities and social organization downstream. Farming patterns on floodplains are severely affected and need irrigation water. Fish populations fall and the effects are felt even in the estuarine areas where the productivity can drop to extremely unacceptable levels. Economic activities and social organization in the downstream region can therefore be disturbed with increased rates of out migration. Dam agricultural productivity and hence land process, and many
other negative impacts. Loss of historic or cultural sites is another cause for concern that arises as a direct impact of reservoir inundation.

1.15.5 Health and Wealth:-

The huge manmade lake created by the dam’s reservoir provides a habitat in which water-borne diseases and parasites thrive. It is increasingly acknowledged that the spread and incidence of diseases such as schistosomiasis, Japanese encephalitis, and malaria is the direct result of water projects. E.g. the construction of Akosombo Dam, Ghana, has created habitats in which insects, snails, and other animals, which serve as vectors for water born diseases, throve.

1.15.6 Development strategy in independent India:-

When India got her independence the country’s economy was almost shattered, due to long years of colonial exploitation and partitions of Indian sub-continent in to two independent nations of India consequent communal disturbance. In that situation being influenced and impressed by the success of the Soviet economy under the planned development process, the Government of India adopted the path of State Centred Planning under the mixed economy set up to accelerate the pace of economic development in the country. While the country’s First Five Year Plan 1950’s was meant for the restoration and reconstruction of the truncated economy, the Second Five Year Plan under the guidance of Professor P.C.Mahalonobia emphasised on development of key infrastructure such as shipping, air and rail transport and key industries like iron and steel, heavy engineering, heavy electrical, machinery and machine tools etc. To lay the foundation of a well build and self-sustaining economy under the leadership of public sector. Since then the country has been making sincere efforts to build up the key infrastructure like power and irrigation in all parts of the country for the development of agriculture and industry. Under this type of development strategy, the government has put lot of emphasis on construction of multipurpose river dam projects on India’s major river to generate hydro electricity at cheaper coat and to enable the agriculture fields located at the downstream of the river and water reservoir to reap the benefit of perennial flow, irrigation under the canal system. It is needless is
emphasize that in animated sources of energy is the lifeblood of modern industry. So also, to increase agriculture yield and cropping intensity and to keep the growing crop immunised from the vagaries of monsoon and weather uncertainty irrigation water made available to farmer under the canal irrigation system is highly essential. It is a fact to recognise that due to the construction of many multipurpose rivers, dam project in different parts of the country the green revolution has show satisfactory success and country’s food grain production is now almost trebled since independence. From a status of food deficient country in the 1950s and 1960s, it has now earned the status of a net food exporting country with a high-level reserve of buffer food stock of more than 20 million tonnes to meet any part of food shortage and drought eventuality in any part of the country. Thus, being so happy and enamoured with the commissioning of the independent India’s first multipurpose river dam project, Bhakranangal on river Sutlej that Pandit Jawaharlal Nehru, the first Prime Minister of the nation unhesitatingly designated such monuments as the , “temples of modern India”. He expected that building of a large many multipurpose river dam projects in different part of the country will not only enable the country to accelerate the pace of agricultural growth by controlling nature’s fury such as recurring floods and droughts, but also it will lay foundation of a strong power base in the from of hydro- electricity at a cheaper.

However, it is now being realised that such vast projects are never an unmixed blessing to humankind. Building of large dams, results in massive in votary displace of man, destruction, and loss of prime forests, agriculture lands and above ecological imbalances and degradation of natural environment. In many cases of official, coast benefits analysis of the project made under the traditional method does not truly reflect the actual social losses and gains. Moreover, the actual life span of such dams is reduced at faster rate due to increasing siltation than their estimated life span. Apart from that while such projects add to nation’s prosperity at the aggregate level, the natural of socio-economic gains emanating from them are shared in such a manner that it favours a privileged few at the cost of pauperization and deprivation of privileged sections. Thus, such development affects different strata of population and rural households in different manners and degrees. *****