CHAPTER II

REVIEW OF LITERATURE
Nearly one third of the geographical area of India suffers from the adverse effects of droughts on agriculture and living standards of rural people. Droughts affect the regions in different magnitudes depending upon the degree of vulnerability of the situations. The resultant effect of droughts is crop failure leading to the socio-economic problems like reduction in farm income, loss of employment days etc. Recurring droughts make the lives of the farmers miserable and reduce cultivators into agricultural workers and further force them to migrate to nearby agglomerations in search of livelihood. Therefore the present chapters reviews various studies made on the socio-economic conditions of people in drought prone areas and also developmental programmeas in drought prone areas.

LITERATURE ON THE CONDITIONS OF DROUGHTS:

Janake Nair\(^1\) investigates into the consequences of droughts in his paper on "Many Faces of Drought". She focuses on the condition of the bovine population or lack of rainfall as much as it is of absence of irrigation facilities and wrong practice of cropping pattern. Citing the case of bovine conditions she feels that in case of her study area land was under commercial crops like cotton, sunflower and sugarcane but fodder for cattle had small area under it. Therefore during a drought fodder could not be made available to cattle. On
similar lines she puts forth the case of scarcity of food grains for human beings.

Madhusudhan Dattatreya and Sathe\textsuperscript{2} in their article on "Causes of recurrent drought in Ahmednagar" suggest that strong and effective implementation of the schemes countered the recurring threat of droughts on a long term days. They suggested four planning alternatives: equitable sharing of water not in relation to right land but in relation to number of persons in the family, eight monthly supply of flow water and command of all major irrigation projects whereby the length of candles I extended seasonal irrigation is to be made available to as large an area as possible, the varabandi of water distribution was measured by quantity of water assured to cultivators and no commitment of block as under sugarcane at present made in this approach to equal the lift and flow irrigation..

In his work "Drought and response of rural families" S.S. Acharya\textsuperscript{3} concentrates on drought-hit areas in Rajasthan state, 27 districts and almost all villages in the state during 1987-1990. The first general effect of drought is in the form of decrease in production via decrease in area and productivity. And decrease in employment and income. The study conducted in two drought prone taluks of Ajmer and Udaipur districts states that many crops failed and fodder could be harvested, price structure changed against farmers. He suggests that soil and moisture conservation of economic activities; pastures and cultivable lands diversification of economic activities development of cottage industries are the major solutions for drought.
K. Balgopal in his article on “A years of Drought” focuses the institutional aspects of drought. He argues that the irrigation policies of Government Skewed. In the absence of a positive policy regarding water conservation the national process of development destroys mechanisms of storage retention and recharge. The author gives the instances from Rayalaseema and Telangana part of Andhra Pradesh. The author makes the points that big multi purpose irrational projects and digging and sinking of bore-wells have discouraged the management of tank irrigation, which was an important source of irrigation in those parts of Andhra Pradesh, within such irrigation policy. In the paper stress has been laid on the conservation and management of tank irrigation. This is based on the fact that in Telangana 62% of the irrigated land receives water from tanks and in Rayalaseema percentage of land irrigated by tanks is 65%. Therefore it is feasible to improve and develop tank, which is fed by rain where as the multipurpose projects deteriorate tank irrigation at the same time quarrying in the region is damaging the ground water tables. In this paper a mention has also been made about the adverse effect of drought on bovine population and farmers.

The paper on “1992 Drought in Maharashtra and misplaced priorities” D.N. Dhangare deals with the question why it is that conditions of water and food scarcity have become a recurrent historical pattern in Maharashtra, particularly, in the less developed regions of Vidarbha and Marathawada. He suggests that the cropping pattern should be in tune with the climatic conditions and drought prone of an area, but not in accordance with artificial
facilities like irrigation system and agricultural price policy. In the conclusion he states that systematic long-term planning for water resource development distribution and management will have to be backed by voluntary efforts for mass education and Mobilisation of resources. In the final analysis these efforts must aim at harmonizing between compulsions of a balanced regional growth and needs of preserving environment through sustainable development.

Wolf Lade Jinsky In his article on Drought Maharashtra explained a sorrowful status of drought condition in the state of Maharashtra. He pointed out that droughts create landmarks of misery all of there own for tens of millions of people. Exercising dependency on rain which itself is scant and inadequate irrigation facilities are reasons occasioning drought. According to the author Drought brings tragic consequences like steep fall in agricultural production, shortage of drinking water, shortage of fodder, an increase in price of fodder, malnutrition and farmers indebtedness. Further he felt that , the drought causes the suspension or remission of land revenue and the non-recovery of loans by the cooperative and banking institutions and Government.

The work of K.Ilaiah on “Drought worsening situation” brought spectrum for drought in Andhra Pradesh for the years 1984-85 and 1985-86 and found that crops worth Rs. 850 crores were lost. The causes according to him have been declining rainfall, disturbance in ecology, breaches in the canals and tanks and inadequate supply of power to the agrarian sector. Most significantly the author brought out the political and bureaucratic causes of drought. Besides, the Central Governments non-cooperation with the state
governments because of two different political parties forming the government at the respective levels has also been considered as an important factor in the failure to tackle the drought problem. All this resulted in labour migration, sharp fall in the agricultural wages, and scarcity of fodder to the bovine population, scarcity of drinking water and most importantly the deaths due to starvation in drought prone areas.

In a study conducted by Venkatram8 the Administrative Feasibility of Tank irrigation authority” in four Southern States viz Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, observed that higher siltation on tank bed, unauthorized cultivation on foreshore areas and lack of maintenance of tank bund, sluices, water weirs, drainage and field channels were the main factors responsible for inefficient functioning of tanks. Further, it was observed that lack of soil conservation and afforestation in catchment area led to flash run-off and erosion. Besides, lack of proper water management systems as well as experienced and trained water regulations and tank committee resulted in the deterioration of tank irrigations

Sharma9 in his article on “Drought Prone Area Programme” stresses on long-term programme to face drought situation in the country. He stated that steps taken on adhoc basis would be less effective in reducing severity of drought. He recognized that drought in India is recurrent without gaps and also that there are the areas which are subjected to drought often. In his evaluation the author found that the programme has been very successful in controlling drought impact. However, he suggested that the next generation problems need
greater attention. Increase in production would require greater facilities for processing the products and for marketing.

In his study on problems and prospects of irrigation development in drought prone areas “Navalwawala B.N.\textsuperscript{10} examined that with latest technology and methods, water consumption can be curtailed in agriculture, industries and cities without sacrificing economic output or quality life. In this connection, the author emphasized problems of acute water resources management and effective utilization of water resources. According to his opinion, water resource on earth planet to day available is at low level than was available 2000 years ago. This study mainly warned that developing countries in general, semi-arid areas in particular are likely to experience “water stress” from the year 2007 onwards. However, in words of author, “projected requirements of irrigation in 2025 AD will be 770 cu.km against 501 cu.km in 1997”. It clearly indicates that strategy of irrigation will have to be expanded more for cultivation. Now there is doubt that whether there is possibility of increase in sustainable cultivated area under irrigation. All these indicate that the irrigation sector is now facing a challenging situation through cumulative effect of irregular and inadequate maintenance of water resource. On the basis of experience gained over past four decades and future estimations, author suggests that it needs to undertake particular reasons of the neglect of maintains and then introduce the drop and sprinkler reasons of the neglect of maintains and then introduce the drop and sprinkler irrigation to minimize the
wastage of the water and all required corrective measures for the management of irrigation systems with more emphasis on farmer's involvement.

Baldev Singh\textsuperscript{11} expressed a view that in an arid region the infection of irrigation input, particularly when developed from low erratic precipitation base, fails to make any major development into the use intensity of land and labour resources. However by crop-mix manipulations, it helps to raise the income of the region particularly in medium sized farmers. The net consequence of these crop-mix manipulation is that investment in irrigation in the region is a profitable proposition except on large farms where the returns per acre per annum fail to meet the cost of irrigation supplies.

Mutas Thaha \textsuperscript{12} improved that drought prone areas in the country occupy as large as 19 percent of the area wherein 12 percent of the country's population is struggling for its very existence with unsatisfied basic needs. The areas in general suffer from water scarcity, either because of the low intensity of rainfall or due to quick rain-off of rain water. In both the cases the soil is unable to meet the water requirements of plants and this deficiency in extreme conditions makes the land devoid of vegetative cover.

In his research notes on "Decline of Traditional water harvesting systems Tanks in the Drought prone Areas of Andhra Pradesh" given by Barah and .Sudhakar\textsuperscript{13} outlined the important traditional water harvesting systems in Drought Prone Aareas. The study was conducted in perennial water scarce districts of Andhra Pradesh. In these areas for ages, the authors peeped into causes for the decline of tank irrigation. According to the research study the
causes are severe financial stringency, rapid increase in the well irrigation and institutional changes. The authors plead that tank irrigation could play an important role as source of water supply alternative to big irrigation projects like, multi purpose dams and canals. The paper is concluded by suggestions which include the early completion of the restoration of all the tanks in the state which would enable regular maintenance and repair of the tanks as per the standards specified, rising of bounds and waste weirs to recover the capacity lost due to silting, desalting cum-reclamation to reduce the area submerged and evaporation losses checking of weed growth in the tank bed to reduce transpiration losses, and regulation of foreshore and tank bed cultivation as well as afforestation and soil conservation of foreshore areas to minimize sitting up. Finally the authors observe that the tank irrigation systems perform extremely useful ecological functions. The function of conservation and recharging of ground water table are the indirect but beneficial functions of tank irrigation.

In his seminar report on “Water resource management in India” I. Satyasundaram explained the role of water management in development in India. He stated ground water has played a prominent role as a primary source of domestic water supplies in rural and urban areas. And there is a great need for farmers participation in irrigation management and urbanization is responsible for pollution of air and water.

Trivedi found that Irrigation infrastructure is precondition for agriculture development. This paper tied to examine the different aspects of
the development of the irrigation infrastructure. Through this study, it is, however, observed that the irrigated area couldn't increase as increase in per hectare expenditure over forty years. On the other hand disparities in irrigation facilities are considerably seen from state to State and between the years. It appears that to promote equity in growth of agricultural sector, even distribution of irrigation in the various regions and the sub-regions of the country are required. Irrigation potential has relationship with actual need for extension of rainfall. The data indicates that medium rainfall zone (between 750mm and 1150mm) enjoys relatively higher share as 35.60 percent irrigated area but such benefits are not available even in high rainfall zone. It gives boost to the Navalawala's (1999) criticism on high rainfall areas that Chirapunji in Meghalaya, which has high rainfall, is called as the "Wettest desert" of the world today. These show that the efficiency of water use is very low in India and inequity of the efforts of development at state level.

Mehra 16 stated that drought prone areas programme which covers 54 units within 13 states aims at integrated development of selected areas/pockets in the country which are subjected to high periodicity of drought due to low and/or uneven distribution of rainfall and low extent of irrigation.

In his book on "Environmental Pollution and management", I. Mohan17 analyzed legal framework for air and water pollution. He also suggested adequate measures like change in land use, safe disposal of wastes, and check of proximity of the project to national park or monument. A systematic approach to environmental problems has been discussed to promote sustainable
development in the form of check on population, integrated land use planning, conservation of biological diversity, slum improvement and environmental education.

A study on minor irrigation and its impact on tank irrigation in Tumkur district of Karnataka was conducted by Das Gupta. He observed that the construction of tanks has increased the capital gains by raising the value of land. Further, he opined that this has led to a marked change in the cropping pattern from Ragi to Paddy. It was also observed that the tank irrigation helped in reducing the inequalities among the farmers to some extent by benefiting the small farmers.

Krishna Kumar, B. in his study in Ibrahimpatnam block in the then Hyderabad district found that low yields, low income and low standard of living of farmers was mainly due to non-availability of crucial input like irrigation, inefficient use of other resources and raising of crops mainly for food and fodder requirements. Is study is also clearly indicated that the yields of dry crops in the region was very low, ranging from a minimum of Rs.45/- per acre to Rs.300/- per acre at the maximum.

M.V.Nadkarni made an extensive study of drought prone areas in his project work on "Socio-economic conditions in drought prone areas". He covered three districts of Karnataka, Andhra Pradesh and Tamil Nadu discussing the quality of rural life in each of the districts he draws direct relationship between development of agriculture in terms of irrigation and commercialization and social-rural life. He pointed out that literacy level,
health standards and general awareness of the public about the Governmental programmes were higher. He found that the neglect of age old practices of agriculture made farmers depend on single type of crop without any crop rotations. Hence it proved to be a great harm to the agriculture production and availability of agricultural production, alone is not a primary occupation and where farmers are engaged in other supplementary activities like poultry, animal husbandry, fisheries etc.,

S.S.Khanna observed a detailed analysis of drought in India in his paper on “Drought Management”. He divides rainfall in various zones on the basis of mean annual rainfall as very low, low, moderately low, moderate, moderately high, high, very high and excess. He analyzed droughts in a period of hundred years from 1876 to 1987 and refers to aspects relating to the implementation of the programme providing relief to drought-affected farmers. The measures to drought management as discussed in the paper have broadly been given as technology backup for agro climatic conditions and to reduce the impact of drought. The emphasis is on to increase the areas under irrigation and the strategy is to inter link the crop livestock fisheries farm forestry and pastures programme and detailing these depending up on the need of the areas.

N.V.N and Ram Reddy in their study found that the incomes of the tribal farmers have increased substantially after the construction of new irrigation tanks. But the yield rates were not found to be so high due to their inability to use high yielding variety seeds (HYVS), fertilizers and pesticides.
The World Commission on Environment and Development\textsuperscript{23} headed by Mrs. Gro Harlem Brundtland, Prime minister of Norway; has made a study of the problems of human race, and held hearings in different parts of the world. Population, food supply, health, preservation of species and ecosystems, energy, industry and urban agglomeration have been identified by the Report as common concerns of human race. The Report pointed out the forests are being denuded in the name of providing food and more comforts, and water pollution, global warming and depletion of ozone are caused in the name of industrial growth.

Bal Reddy, K.\textsuperscript{24} in his study on Economics of Dry Farming in Nalgonda District of Andhra Pradesh” Concluded that:

I. Capital investment was higher on small farms in comparison with larger farms;

II. Cost of cultivation of crops was more on small farms than large farms;

III. Returns were higher on small farms than large farms;

IV. Castor was found to be the most profitable crop among the crops cultivated;

V. The efficiency ratios for factors as well as for the farm as a whole showed that the small farms were better operated than large farms.

Krishna Kumar, B.\textsuperscript{25} suggested that though, there was certain rigidity in the existing cropping pattern in Ibrahimpatnam block in the then yderabad district due to dry conditions, an alternative cropping pattern could be evolved with the existing resources for dry and wet conditions separately.
Padmanabhan, and Patnaki, S.\textsuperscript{26} estimated that about 30 percent of direct seeded rice-raising partly under rain fed upland soils in the country to achieve best results and to develop suitable implements such as tractor mounted soil harrow and combined blade and rake type weeder in order to enhance the conservation of soil moisture.

According to Dhawan\textsuperscript{27}, increases in agriculture production in inexorably interlinked with development of irrigation. Irrigation provides for higher intensity of cropping and productivity. Among the minor irrigation systems, the relationally dominant groundwater irrigation has proved to be more efficient in terms of ensuring higher productivity and intensive of cropping.

It is true that agriculture has made great strides with advent of groundwater irrigation. Lets look at advantages and disadvantages of groundwater based agriculture the groundwater can be put to use with easy and speed with very little gestation period and is taped to large extent and it is the most dependable source of water supply in year of drought. Whereas, through the surface irrigation projects, in certain canal command areas the water table is progressively rising that leads to water logging and salinity, making the soil unproductive and restricting the plant growth resulting in decline in crop yields. He suggests groundwater conjunction with surface water in command areas could be planed to achieve optimum development of water resources, and ultimately to improve the agricultural situation of our country in achieving
self-sufficiency and creating export potential in food grains and agricultural commodities.

Taj Bhadur\textsuperscript{28} in his studies revealed that DPAP has had a positive impact in helping the beneficiaries in creating assets and in increasing the farm income through diversified cropping pattern. He further concluded that there was inefficiency of resources use on both the participant (DPAP) and non-participant farms.

In her article on “Need for fresh thinking on Environmental Issues”\textsuperscript{29} Anjana Chattered made a plea for a balanced evaluation of the environmental issues and not to be carried away by the outcry of developed nations. She calls for sensible environmental policies based on the resources and technology ensuring hygienic living and working conditions, safety against industrial hazards, forestation and authentic information to the masses on environment.

In his paper “Watershed development planning and strategy” Das. S.N.\textsuperscript{30} describes that optimal use of soil and land resources to provide the needs of ever-growing population is a fundamental issue for the international community is finite and menace of land degradation due to water wind erosion is real. In order to ensure sustainability in crop production, the above stated causalities would need to be overcome through a scientific data based development on watershed basis. The paper describes the modalities of generating a soil and land information system for the entire country.

Singh \textsuperscript{31} Concluded that the ratio of MVP to factor cost investment on seed resources, provided the highest returns (Rs.8.50) per Rupee followed by human
labour (Rs.4.59) and manures and fertilizers (Rs.1.64). However returns per Rupee on bullock labour found to be negative (Rs.11.26) indicating excessive use of the input, they further stated that on sample farms, the farmers were not optimally utilizing input factors and there is a sample scope for further increasing the use of these resources on the total farm situation in dry land farming of Ranchi district.

According to Nageswara Rao, T.\textsuperscript{32} though Andhra Pradesh is endowed with some major river systems, it suffers from chronic droughts in some of the districts. It is observed that nearly 85\% of the state is under laid by hard rocks like granites, gneisses and other consolidated rocks and rest of the area is occupied by the coastal alluvium and sifts rocks. In hard rock areas, groundwater occurrence confine to maximum depth to 80m and can be taped by means of dug-well, dug-cum-bore well and bore well. In alluvial zones and valley fill areas can be accomplished through infiltration well, filter points and tube wells getting high yields. Others types of deeper soft rock aquire deep tube well to be constructed. The possibility of failure of well is very high in hard rock areas I absence of proper schemes of scientific and intergrated hydrological and geological investigation. Some of the zones in the state are subjected to groundwater levels. The implementation of special programmes for construction irrigation wells under IRDP, NREB etc, which, are being implemented intensively through District Rural Development Agencies (DRDA) and Integrated Tribal Development Agencies (ITDA) etc should continue (Nageshwara Rao.T, 1998).
The focus here is simply in assessing the extent of over exploitation of groundwater through different approaches. According to volumetric data approach, the national level groundwater resource is still for depletion or over exploitation as only 30% of the groundwater resource was exploited for irrigation purpose in 1992. It seems to have pressure on groundwater exploitation. According to area approach, utilized groundwater 30 m.ha. is out of 40 m/ha. Ultimate groundwater potential. This indicates sign of full exploitation. Official statistics indicate a rather confusing picture of groundwater exploitation in India. As per the irrigated area figures of the planning commission, development of groundwater irrigation has reached disturbing levels in many states, notably UP, Gujarat, Punjab and Tamilnadu. But the less know volumetric statistics in Board are rather reassuring. Barring a dozen districts of the West-Indo-Agnatic plains, no state as a whole appear to have reached the danger mark of the groundwater over exploitation. The reality is some where between extremes more likely near to the Boarder’s than commission assessment (Dhawan B.D, 1995).

As a matter of fact, groundwater is not only used for the purpose of irrigation but also domestic, municipal, industries, and power generation, in land navigation and ecological. According to NCIWRD, over development of groundwater is prevalent in all aspects above by the year 2050 (estimated utilizable groundwater 396 BCM on the contrary requirements from groundwater will be 428 BCM). There are several causes of over exploitation. It was mainly caused by government structures for encouraging groundwater
development through providing electricity subsides and well developed credit schemes. In addition, Indian Easements Act, 1882 which incorporated the principal of the English common law, allowed land owners an unlimited right to withdraw water form beneath their property and a Model Bills of 1970 and 1992 are also confined to impose limitation on institution financing for schemes requiring credit so that it leads to socio-economic inequity between rich and poor people. In sum it is observed that over exploitation of groundwater is caused by poor resource management and lack of understanding basic scientific research (Navalawala B.N, 2000).

A study on “Tank irrigation in Tamil Nadu - a case study on farmers participation” by Pundari Kanthan revealed that the tank rehabilitation programme at Padianallur resulted in increasing the cropping intensity from 156 to 160 per cent and crop yields by 15 per cent. However, equitable distribution of water to all fields in the different reaches of the tank command was not achieved. Besides, conflict prevailed between the farmers who hitherto enjoyed a larger allocation of tank water and those who did not. They concluded that the analysis of the events, processes and accomplishments made so far in the participation of the farming community are to ensure the sustainability of the improved irrigation system.

In his paper “Watershed management in India’ S.L. Seth stated that watershed management would remove hunger and poverty from poor areas and watershed management would restore ecological balance, provide green cover over denuded areas, bring in more rains and improve environment. If
watershed management has to become a people's movement, technologies would have to be simple, low cost and should be based on vegetative measures which are self regenerative.

Tej Bhadur\textsuperscript{35} reported diminishing factor returns in general and constant scale returns on all types of farms and inefficient use of resources on all types of small farms since the MVP to opportunity cost ratios widely deviated from unity.

According to Dhawan B.D. \textsuperscript{36} groundwater exploitation has become a matter of concern, especially among hydro geologists and financial institutions, which massively support groundwater development in India. Direct, regulatory measures on the lines of the model bill suggested by the center, namely, the “Ground water (control and Regulation) Bill” of 1974, has yet to be enacted by the state legislatures. And the indirect measures, such as restricting institutional finance and electricity connections in the endangered areas, have proved rather ineffective, In the particular conditions of reality small and fragmented landholding in India legislative enactment are of little practical value and, therefore, main reliance has to continue on direct measures. People’s participation at the local level with regard to minor surface irrigation work that may prove helpful improving the fraction of rainfall infiltrating in to the ground. In particular, community effort in properly maintaining irrigation tanks (desalting of tank bed; proper maintenance of feeder channel if any, etc) is good for recharging groundwater as well. Likewise, percolation tanks can be
taken up through community effort as well provided good geological advice is forthcoming – otherwise these may become simply ‘evaporation’ tanks.

Makhan Saikia37 in his article “Drought Revisited Nation in trouble” deals with the drought problem on the point of view of this strategy to tackle it. The author particularly discusses ABHIJIT SEN COMMITTEE REPORT” on long-term grain policy. This report endeavors to find-out principles and Guidelines for a long-term policy as there was a short run crisis in the grain management system. The author points out of the huge and deteriorating stocks of grain. The author himself supports the view of committee (M.S.P) that minimum support prices become more widespread and it be given statutory status. In the article the author concludes with the actions required to tackle drought. He suggests two ways, one is relief measures for the affected population conspicuously landless laborer, the tribal people, dalits women and children, besides animals, secondly providing agricultural rehabilitation in drought situation: it means minimizing the losses of agriculture.

In his paper “Planning and management of watershed projects”, J. Venkateswarulu 38 noted that the watershed development programme aims at sustainable use of the resources ensuring food, nutritional and social security to one and all in the watershed. Equity and access of the usufructs to the poorest should be upper most in our mind while executing such a programme and the main aims of this programme should be increased employment, enhanced availability of fuel, fodder, fertilizer (manure) fruits, improved ground water recharge and sustained human health, soil health and animal health.
Srinivasan, M.\textsuperscript{39} revealed that drought was a problem faced by almost all the countries of the world, and it is particularly acute in India where vast areas depend on monsoon for cultivation. As such he suggested intensifying water technology applicable to agriculture, soil management and development of drought resistant crops to combat the permanent drought-resistant conditions providing in different regions in the country.

In their study on performance of watershed technology at ICRISAT Center for right agricultural years\textsuperscript{40} Kshirsagar, K.G. and Ghodake, R.D observed that improved cropping systems yield increased from 3.9 to 4.4 tons per hectare against 0.5 to 0.7 tons with traditional Cropping systems. On average, the watershed technology gave about 3 tons per hectare of cereal output and 1.2 tons of pulses. The average gross returns of the improved options were 4 to 5.4 times higher than those of the traditional systems. The additional gross benefits generated by the watershed-based technology were in the range of Rs.3, 300 to Rs.5, 400 per hectar. This amounts to marginal rates of returns of 160 to 300 per cent. In this study it was found that the watershed technology promises to reduce risk as compared to the existing cropping system of a single most-rainy season crop.

In their study on “A holistic approach to soil and water conservation” Detey K.R., Gore V.N., and Joy K.J.\textsuperscript{41} viewed that the success of watershed development depends upon the perspective for an integrated development of land and water resources should go beyond subsistence, so that biomass surplus over subsistence would provide the inputs for a dispersed energy and
industrial production system. The emerging biomass processing techniques have the potential to generate non-farm income and meet the needs of accelerated infrastructure development not only of rural area but small towns and urban as well. The local groups should be informed of the prospects for raising productivity and creating opportunities for livelihood.

A study conducted by the “Committee on plan projects, Government of India”42 in Tamil Nadu State, observed that the storage capacity of the tanks was declining rapidly on account of extensive cultivation in the foreshore lands and also on tank bed and supply channels as well as huge silt accumulation over tank bed, sluices and fields channels. Weak bunds, wrongly placed, outmoded and leaky sluices were the other problems relating in inadequate supply of water.

Ninan43 in his study of European aided watershed development programmes found that the gains have been more for the medium and large farmers because of the size of their land holding and their capacity to invest in water extraction technologies. In an assessment of European aided watershed development projects in India he also reaches more or less the same conclusion.

In his study on Sustainability of watershed development programmes to dry land agriculture in Karnataka S. Erappa44 found that there has been an increase in the productivity of almost all crops, as a result of watershed development programme across all landholding sizes. However, the study also reports that there has been a drop in yields of few crops like ragi and maize.
Another study on Gulbarga shows that there has been an increase in the productivity of crops like tur, Hybrid jowar and bajra.

The “Study on watershed” by Sarin R. and Ryab J.R. noted that total rainfall in 1980 was only 400 mm, which was below 43 per cent which was below normal. Though the onset of the monsoon was early, the rains receded early and crops suffered due to late season and drought. As economic analysis revealed that though this is comparatively low rainfall higher profitability could still be achieved using the improved technology compared to traditional technology. The average net profit from the improved watershed plots was more than three times and more than those from traditional fields. The improved system was more superior to the traditional system in terms of yields and profits. In their book on “Environmental protection and Industrial Development” Anil Kumar and Umesh Prasad Singh discussed environmental problems that arise from industrial interference with natural processes. He opined that industrialization attracts population, encourages sprawls, puts extra demand on environmental resources leading to defoliation, deforestation, pollution, and in combination causes a variety of physical as well as social problems. The book emphasizes environmental issues that have emerged in the natural setting of the middle Domodar Valley where man interacts with nature in course of mineral extraction and their utilization.

Dakshina Murthy emphasised the need for an enhanced provision of moisture under rainfall conditions, possible by taking measures aimed at
increasing production utilization of atmospheric precipitation naturally reaching a given area, i.e., elimination of run-off.

‘In an article N.Purendra Prasad and P.Venkata Rao explained that the adaptations of peasants in a stress environment’ is an important one. The paper dwells on the recurrent drought situation, which, according to the authors brings substantial socio-cultural changes in the village community Ramapuram of Rayalaseema in Andhra Pradesh in scarcity conditions. This study is an inter-disciplinary effort to look into the impact of drought on social life. The researcher gives an anthropological account of drought condition. The study area is based on fieldwork conducted over a period of eleven months during (1992-1994) and 192 households in the Ramapuram village were interviewed. The case study was conducted during the different agricultural seasons to cover the seasonal migrants. In order to understand the differential impact of drought various Jati (caste) and land categories were classified into four groups of fifteen Jati’s namely cultivator’s Jati’s agricultural labour Jati’s scheduled Jati’s and Services Jati’s. According to their traditional occupation and social pattern in the local hierarchy. The researcher brings out two important consequences of drought one migration two sale of land and others assets. The Field Survey collected shows that migration among agriculturists, labour Jati’s was more (77%) where as among Scheduled Jati’s services Jati’s and cultivates Jati’s, it is not so.

In the project study conducted by K. Puttaswamaiah titled “Cost-benefit Analysis of Irrigation and drought proof” in the year (1989) covered the entire,
Bijapur district of Karnataka State. Out of eleven talukas of the district eight were selected. The project intended to study the 'Drought' prone Areas programme funded by World Bank in January 1975. Mr. Puttaswamaiah makes detailed assessment of the programme. The programme had facilitated irrigation projects proved to be most successful. Other programmes were alone introduced like (1) Soil conservation and dry land farming (2) Animal husbandary programmes (3) Afforestation and pasture development (4) Sericulture (5) Horticulture and fisheries. All these additional programmes through significant proved to be partially successful, however the credit flow for the farmers and other beneficiaries was an important factor under this programme.

In his conclusion the investigator observes that a multi proned strategy would help drought prone area.

Joshi 49 opined that the farm is a relative one spread throughout the gamut of aridity, the low and irregular rainfall was the most important item in the physical conditions. However, there was no particular minimum of rainfall and no other single criterion that will serve to distinguish a desert. The task force on integrated rural development (1973)2 pointed out that from the practical point of view, drought may be regarded as a period of abnormal dry weather, sufficiently prolonged for lack of water to cause serious hydrological imbalance in the affected areas.
Jaiswal found out that the DPAP has generated additional source of employment to the extent of 9.4 man hours per day per family under dairy farming as a consequence of distribution of milk animals generated significant additional income.

LITERATURE ON DEVELOPMENTAL PROGRAMMES IN DROUGHT PRONE AREAS

Recurring draught conditions have been affecting the development of the people in draught prone discreet and making the agricultural activities and form operations difficult and sustainable. Hence, a number of programmes have been executed by the Government for the socio economic development of rural people. These programmes mainly relate to the alleviation of poverty and providing income generating employment opportunities in villages. Several programmes for the upliftment of farmers have also been implemented by the government. Each of these programmes had partial impact on the socio-economic progress of the farmers and rural population. Therefore some of the important studies made on socio-economic conditions, are here under reviewed Dandekar and Rath in their shady on Poverty in India felt that the aim of a successful rural works programme is by offering continuous and regular employment for a section of the agricultural proletariat who are willing to work at wherever work exists. When the work in one place is finished they must be moved to another place. An organization must perform this essential function.

Dantwala in his paper on poverty in India found that growth in India
has no doubt been slow, but there is enough evidence to show that certain regions and sections of the population, especially the most vulnerable, have not been benefited even from this slow growth.

Ahluvalia\textsuperscript{33} in his paper on Rural poverty and Agriculture Performance estimated poverty in rural India and 14 Indian states for the period 1956-57 measuring absolute poverty in terms of real per capita consumption using Head Count Ratio and Sen.'s index. At the All India level he found that there was a marked fluctuation in the incidence of rural poverty - declining till 1960 - 61 and rising sharply through the mid 1960 - reaching a peak in 1967 - 68 and again declining thereafter.

The Economic Survey 1998 - 99 showed that the government has relied mainly on three approaches for reduction of poverty and unemployment - the first entails pursuit of higher economic growth which will improve the levels of living of all groups of people in the society including the poor; the second revolves direct anti-poverty and employment programmes; and the third has stressed high priority to government expenditure on social sectors. The survey found that the poverty ratio (i.e., proportion of population below poverty line) declined from 56.4 percent in 1973-74 to 37.3 in 1993 - 94 in rural areas, while for the country as a whole it declined from 54.9 percent in 1973 - 74 to 36 percent in 1993-94.

K.S.Parikh and S.Subramanian,\textsuperscript{54} in their work on poverty in India - Data base 'issues' obscured that policies for poverty alleviation can be divided into (1) Policies that redistribute income under the first category; and (2)
policies that seek to alleviate poverty by changing the content of growth: its sectoral composition or the choice of technology. Under re-distributive policies, come direct measures of redistribution, such as taxes and transfers and other necessities increasing the price of factors that the poor are relatively well-endowed with, namely unskilled labourer and increasing the demand for such labour through employment programmes. Of course, this division is by no means watertight; promotion of growth may also redistribute income, perhaps even worsen the condition of the poor and redistribute measures may effect growth in any thing but the short run.

Lalitha Devi\textsuperscript{55} who specially made a study of change of status in the family as a result of employment examined four variables which are important determinants of status within family, such as power in decision making in the family, freedom in spending the family income help received in discharging household responsibility and observation of traditional customs. The author finds could find that the employed respondents showed higher scores on these variables than the unemployed respondents.

N.J. Usha Rao\textsuperscript{56} in her book “Women in a Developing Society” mentioned that the Mahila Mandals were formed to act as a nucleus of centre around which a number of activities for women were organized to improve the socio-economic status of the rural women. A number of voluntary agencies both local based as well as branches of central organization like All India Women’s, Conference, National Women’s Council, Bharatiya Gramina Mahila Sangh, Indian Council for social Work etc., have been rendering useful service.
in the welfare of women.

Sakuntala Narasimhan 57 analysed the issue of women empowerment with respect to rural women. Her study specially focused on rural SC and ST women who are triply disadvantaged as women, as rural persons and because of their low caste status. The aim of her study was to assess the effectiveness of an alternative strategy of development and empowerment of women particularly of poor women from socially disadvantaged communities in rural areas. She comes out with a strategy that begins with awareness generation, mobilisation and psychological priming.

Anitha Anand 58 in her book Employment and education stated that “Rural women contribute, both directly and indirectly towards productive tasks in a rural society in India, women mark up to 80 to 90 per cent of the agricultural labour force and produce 44 per cent of the total food. Government of India reported that, women contribute largely to country’s economy which is mainly agriculture based. Although distribute, i.e., justice has been categorically underlined in all the development plans, the needs of women have not been adequately addressed.

C.Muthuraja 59 in his article focuses on the economic empowerment of women through education and employment. He pointed out that the process of empowerment involves not just an improvement in physical and social conditions but also equal participation in decision-making process, control over resources and mechanisms for studying these gains. He strongly believes that the empowerment of women is anchored on their economic status in the
society. Therefore he suggested capacity building in case of women through education, skill, knowledge and information. He concluded that there is a direct correlation between education and employment and naturally is the basis for empowerment of women.

Eenakumari 60 in her article “Socio-economic status of women in India”, stated that, the orientation of a society as a whole regarding the desirability that women should play an equal part in the country’s development was taken as a very important pre-condition for the advancement not only of women but the country as a whole.

Yadav 61 discusses the various issues concerned with the empowerment of women. He analyses the conditions and problems of working women in organised and unorganised sectors. He points out the role of the state in women development and goes into the details of the programmes and action plans undertaken by the government to help empowerment of women. He concludes with a series of suggestions including employment opportunities and support services to empower the women.

Thus, the various studies on the issue seem to suggest that employment of women helps their empowerment in the family at least to some extent.

Review of literature related to various issues and problems of working women suggests that most of the studies throw light on social and psychological aspects of the problems of working women. There are very few studies which focus on the working conditions and problems of women at the work place especially in the organised sectors.
According to Pushpa Joshi "Centre for Women's Development Studies", (New Delhi, Navjivan Press, 1988), Women in poverty remain unrepresented not only on traditional institutions of power but also on the statutory bodies of local Government and decision-making process. Trade unionism has hardly penetrated the hard core of the unorganized sector making poor women, politically invisible.

Roma Manjundar observed that the task force after analyzing the present situation regarding women's development programmes suggested that the key components of all training programmes for development administrators should be as follows:

1. The understanding to key concepts of the goals underlying development policies of the country.

2. Articulating the multiple roles of the administrators such as informant, co-ordinator, promoter, modiliser, linkage builder, educator, monitor etc. Examining their perceptions and biases regarding women through a process of dialogue and exposure to realities.

3. Broadening the possibilities for women's involvement in various types of development activities by questioning the established frame work.

A.M.Roy, in his article on "Drought Prone Area Programme - Role of the student youth" Supplemental to agriculture, livestock development occupies a key position in the project area. Since 1981 the beneficiary oriented schemes of animal husbandry are being implemented through IRDP and only the infrastructural development is now supported by DPAP.
Arun Mukaopadhyya in his paper on obsured that the whole programme of improving and adjusting input-cun-service supplies was mainly concentrated on the bigger farmers, while small and marginal farmers with poor resources position were neglected. Thus, during our first three plans the Community Development Programme which had a main accent on agricultural development was neither able to solve the food problem nor that of small and marginal farmers by way of creating conditions for increasing production and income and more employment opportunities for these weaker sections. As a result, majority of them remain below poverty line, i.e., a position below the minimum standard of consumption of Rs.20 per capita per month at 1960-61 prices or Rs.37 at 1971-72 prices. So went the comment by Prof. Dandekar; "They (rural poor) must wait for the promised bread which will come at the end of the fourth five year plan for economic development wherein is the eternal unknown."

Kamata Prasad in his paper on "SUSTAINABLE DEVELOPMENT OF DROUGHT-PRONE AREAS -- POLICY ISSUES AND OPTIONS" discusses the basic approach behind government-sponsored development programmes for drought-prone areas in India in the context of their sustainability contrary to the environmentalists view, he presents the case of environment friendly major irrigation works. He also argues for diversification of economic activities in drought-prone areas and building a reliable food security system.

K.V.Patel in his study on Financing the Farms: Some Issues for the
Development Programmes in a Drought-prone Area attempted to highlight the role played by the credit institutions in one of the DPAP areas with a view to understanding what awaits these institutions if the rule assigned to them in the implementation of the development projects in a DPAP district is to be played effectively. This is done with the help of empirical study of the selected families from one DPAP district, viz., Anantapur in Andhra Pradesh, conducted for the agricultural year 1974-75.

Rishi Muni Dwivedi, in his book on Poverty Development programmes in India, observed that in the wake of economic reforms, while the economy has performed well in terms of growth rate of GDP, its performance in the form of human development indicators has been unsatisfactory. Social sectors like health, family welfare, education, training, employment, women empowerment and rural infrastructure have lagged behind in the race for better standard of living.

This book explains and examines various programmes and schemes of the Government of India to improve the living conditions of the vulnerable sections of Indian society and comments on their implementation. In all, 60 programmes and schemes, categorized in 9 theme parts, have been included in the volume. So overlapping in categorisation is possible because a programme/scheme may have multiple objectives.

Rao Sarveswara in his study on the problems of poverty and unemployment in Ramachandrapuram Taluk in East Godavari District of Andhra Pradesh underlined the importance of institutional reforms giving...
greater access to productive resources for the poor households and public policies, which promote investment in both the agricultural and non-agricultural sector.

Ramunaid 70 in his study on NREP reported that, there is need to have continuity in nature instead of seasonal. The study suggests that the unskilled labour also should be paid minimum wages as stipulated in the guidelines.

Vaish RR 71 in his study on employment programmes in Kupkhur village in Sangrur District of Punjab with an idea of examining the present status of employment, to assess the investment made by farmers on their farms and the corresponding increase in agricultural productivity and simultaneously evaluate the impact of development programmes on village economy. Data on sample basis were collected through questionnaires and interview method pertaining to 1954-55 to 1960-61 as reference period. The study revealed that the development programmes had a positive impact on the economy of the farmers. Large investment in machinery, increase in irrigated area through installation of tube wells, adoption of high yielding varieties of wheat, increase in agricultural output and marketable surplus and had largely benefited to farmers. However, labourers and weavers, who form a sizable part of the village population, mostly remained below poverty line. Even the employment situation was not found to be satisfactory.

Rao S.K. And Amal Sanyal72 in their paper examined what factors would be relevant in promoting employment without inflation (i.e. prices of wage goods) and whether the policies, which the government has in mind, would be adequate in accomplishing this objective. They strongly felt that the employment policy was caught with the inherent contradiction present in a
mixed economy, i.e. how to promote more output of wage goods and at the same time keep profits high. It is this contradiction, which the policy makers must solve before employment generation through greater labour intensity can be taken up seriously.

Mahajanu V.S.\textsuperscript{73} reported in his paper on Jawahar Rozgar Yojana 'Economics and Experience', the JRY programme conceptually combines employment generation with useful asset creation and at the same time it does away with the bureaucratic chain of resource transfer from the centre to the beneficiary village. In fact with the mergence of Panchayati Raj, Panchayats are now the direct recipients of these resources earmarked for them by the Ministry of Rural Development of The Government of India.

"According to Dr. R. Arole,\textsuperscript{74} Director, Society for Comprehensive Rural Health Project. The poor must come forward and for this, local leadership has to be nurtured. We have to train the women leaders for amongst the rural poor which is not an impossible task. It is possible to train illiterate women leaders in curative and preventive health and also in economic activities leading to the increase in women's income. The local women leaders are in a better position to organize Mahila Mandals among the women of the disadvantaged segments of the rural community and take an organized action to solve their own problems, if need be, through pressure tactics. In rural development the following three things should be uppermost in the minds of persons interested in this activity: (a) decentralized decision; (b) trustworthiness; and (c) decentralized decision-making and passing on the responsibilities to the beneficiaries concerned.
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