CHAPTER-II
THEORETICAL BACKGROUND

In many ways the study of developing countries has been, to coin a popular phrase, 'the cutting edge' of post world war II social and political theory. This is particularly so if we accept the view that teaching and research in the social sciences tend to reflect the prevailing interests and priorities of the wider society. Consequently and despite early expectations, disillusionment with the performance of the Third World steadily increased since the period of heady optimism which abounded in the late 1950s and early 1960s. The expectation of the problem-solving social scientists that it was possible to plan for prosperity in the Third World and that most of the problems were primarily technical in nature, was to be short-lived as problems not only endured but in many way increased, throughout the First United Nations Development Decade of the 1960s.

Since the nineteenth century and more particularly since the Second World War development became an object of state policy. With the end of colonialism, expectation were high that the former colonies would experience a period of rapid economic growth and positive social transformation. During the 1950s economist, political scientists and others began directing their attention towards the practical and theoretical problems of development in the Third World countries or as they were then called the underdeveloped countries. Discussions on development were peppered with expressions like 'modernisation', 'community development', 'dependency theory', 'structural adjustment', 'self-reliance', 'participation' and so on.

Development theory until quite recently was dominated by theories and models derived from experiences of western economic history. The emergence of capitalism and the advance of the industrial revolution gave a
distributive form to western development thinking. Development and economic growth became synonymous with progress and higher levels of civilization. Growth was seen as a natural process which could be nourished through the application of correct and timely inputs. Likewise, it could be impeded by bad conditions but once these constraints were removed the process would continue. It was commonly believed that the problems of the Third World could be solved by directly applying theoretical constructs derived from the study of the historical evolution of the west.

Development economics in the post-war period emerged from a recognition that the free market mechanism by itself was not an adequate framework for ensuring the development of underdeveloped countries. A whole range of economists from Raul Prebisch and Myrdal at one end and Paul Baran and A.G. Frank, A. Emmanuel, Samir Emin, Rosa Luxembourg etc. at the other end of the theoretical spectrum were able to show that the so-called free market in the twentieth century on a world scale operated as a mechanism of real resource transfer from the underdeveloped to the developed countries.

According to Gunnar Myrdal, while in the developed countries an analysis in purely economic terms may make sense and lead to valid inferences, in underdevelopment countries this approach was simply not applicable.¹ It was said that underdeveloped countries were underdeveloped, not because they did not have scope or investment but because they had no capital to invest and they had no capital because they hardly had any savings.²

Out of this atmosphere emerged one common view that industrialization was a necessary condition for self-reliant development and this required conscious state intervention.³ Emphasis on the need for large-scale state action was laid not only by the advocates of balanced growth like Rosenstein-Rodan but also by other writers like Leibenstein, who justified the
necessity of strong government action on the grounds that unless a 'critical minimum effort' was made which could be done by the state alone, the rate of economic development would not be able to exceed the rate of increase in population.  

Development Thinking – Some Recent Trends:

In recent years the question of equity and equality in the distribution of the benefits from development have became key elements. Another area of increasing interest is the relationship between development and social transformation. More and more students and practitioners of development are beginning to see a need for changes or transformations in the existing economic, social and political structures and relationships if development is to genuinely benefit the poor and the disadvantaged.

According to Robert Chambers, the problems of development has many levels – international, national, regional, community, household and individual; many dimensions- of gender, class, caste, age, occupation and physical and mental capability; and many implications in domain which are political, legal, economic and ethical. The problem he says, is how, in conditions of continuous and accelerating change to put people first and poor people first of all; how to enable sustainable well-being for all.

According to Norman Uphoff, putting people first in development projects comes down to tailoring the design and implementation of projects to the needs and capabilities of people who are supposed to benefit from them. The says that no longer should people be identified as 'target groups', rather as 'intended beneficiaries'. They are to be benefited rather than impacted.

Development is obviously a complex process involving people on one hand and the factors of production and organisation on the other. Development theorists no longer regard development as an autonomous process and are more interested in the study of barriers to development than
in the analysis of the mechanisms behind it and in trying to evolve strategies to remove them.

According to N.A. Majumdar, one of the most important lessons learnt from development experience is that growth does not trickle down, development must address human needs directly. The second lesson, he says is that sustained development should be rooted in the processes that are socially inclusive.7

What needs to be noted is that notwithstanding all the development efforts that have been carried out, it has been claimed by many scholars that substantial enough has not been achieved in improving the quality of the life of the poor. Researchers have attempted to analyse the cause of ineffectiveness of the development programmes. They found, for example, that the international agencies and official and non-governmental agencies from the developed world assume that technological and capital transfer could bring about changes. But failure is attributed to the lack of participation from the beneficiaries and poorly managed delivery system to distribute the benefits of development to the poor.

Thus, the role of development thinking, is not so much in building up theories or models but in evolving strategies of development to reach a particular goal, involving the action of poverty and inequality, on the one side and cultivating maximum people’s participation in maximum activities at all levels, political, economic and socio-cultural, on the other.

In developing countries like India, where majority of the people are rural-based, any attempt at bringing overall development needs to lay greater emphasis on rural development. According to N.A. Mujumdar, perceptions of development which take into account the larger concerns of life beyond the mere growth objective, rural development becomes multi-functional. He says that in economies like that of India, rural development holds the key to all round development, reduction of poverty, improvements in nutrition standards
and health of the bulk of population, reduction in the incidence of illiteracy, improvement in the quality of life etc.⁸

Rural development issues were not always to the fore in the modernizing development studies that emerged in the 1940s and 1950s. Rural development only became a distinctive field of policy and practice and of research in 1970s but nonetheless a broader concern for rural development and agricultural productivity was always present in the 1950s and 1960s.

**Rural Development as a Concept:**

World Bank in 1975 defined rural development as a strategy designed to improve the economic and social life of a specific group of people – the rural poor. It involved extending the benefits of development to the poorest among those who seek a livelihood in the rural areas. The group included small scale farmers, tenants and the landless.⁹

According to Robert Chambers, rural development is a strategy to enable a specific group of people, poor rural women and men to gain for themselves and their children more of what they want and need. It involves according to him, helping the poorest among those who seek a livelihood in the rural areas to demand and control more of benefits of development.¹⁰

Mishra et. al., enumerated the following objectives of rural development: (i) increase in agriculture productivity and output; (ii) bringing efficiency and improving the use of scarce land and water resources; (iii) supply of capital resources; (iv) maximisation and creation of employment opportunities; (v) redistribution of income and (vi) raising the standard of living of rural population.¹¹

Mehta concludes that rural development should be aimed at the following aspects, viz., better quality of life, ecological balance, access to
means of production and appropriate technology, institution building at the village level and self-reliance.\textsuperscript{12}

According to D.M. Nanjundappa, rural development is generally conceived of a multisectoral activity which includes, besides agricultural development, rural industry establishment or improvement of social overhead facilities or infrastructure like roads, communications, electricity, markets, water supply, banks, welfare services and programmes which could be for disease control, improvement of nutrition, improving adult literacy, family planning etc. He says that the concern here is about not only the economic progress but also the social progress of the poor in the rural areas.\textsuperscript{13}

Approach to rural development thus emphasizes the following, according to Mishra and Sharma: (i) a direct and time bound plan of action for improving the living conditions of the rural majority and their quality of life; (ii) all-round development of the abundantly available manpower, with technologies being devised to promote this objective, simultaneously increasing productivity and enhancing work satisfaction; (iii) promoting real participation of the rural majority in the decision-making, mobilization and implementation process; (iv) an integral approach that will integrate sectors of development with reference to an agreed package of goods and services and in a more fundamental sense integrate different levels (central, provincial and local), areas (rural and urban) and classes of people (rich and poor), (v) the promotion of self-reliance at local as well as provincial and national levels in achieving these objectives.\textsuperscript{14}

**Planned Development- The Indian Context:**

On October 13, 1954, when the first five-year plan was in operation and the second five-year plan was being formulated, J.L. Nehru said: "We are starting planning for the 360 million human beings in India...... what do the 360 million people want?.... I suggest that the only policy that we should have in mind is
that we have to work for the 360 million people; not for a few, not for a group but for the whole lot and to being them up on an equal basis. As per Amartya Sen, it was explicitly in terms of raising the quality of life of the masses that the objectives of planning in India were seen then.\(^{15}\)

Generally speaking, according to Anturo Escobar, the concept of planning embodies the belief that social change can be engineered and directed. Thus, the idea that poor countries could more or less move smoothly along the path of progress through planning has always been held as an axiomatic truth.\(^{16}\)

Planning and policy making in the opinion of Shiv Raj Singh, are interrelated. Planning can be said to be deciding in advance what to do, how to do it and who is to do it. So according to Singh, planning in its broadest sense means systematic preparation for action. And policy, he says, determines the objective which have to be achieved and the progress of decision-making are the means through which these objectives are achieved. Definition and determination of these aims or objectives is the primary task of policy formulation and a continuous process of decision-making ensures the achievements of these objectives, in Singh's opinion.\(^{17}\)

Policy formulation is taken to comprise five aspects, according to Ishwar Dayal: (i) predicting and defining the areas where policy formulation is needed; (ii) the process of formulating a policy; (iii) planning programmes and projects to achieve the purposes of the policy; (iv) reviewing the policy by setting operational measures of the effectiveness of the policy and (v) revising the policy if the review shows that new measures are needed.\(^{18}\)

After reviewing the policy formulation process in the government of India, Ishwar Dayal, Kuldeep Mathur and his colleagues concluded: The style of policy formulation involves extensive advice and consultation. The outstanding feature of policy-making is characterised by accommodation and
settlements, involving the political, administrative and specialists groups as far as possible.\textsuperscript{19}

According to Ajit Mazoomdar, the Indian political leadership of the fifties understood that to make planning an instrument for comprehensively restructuring and developing India's economy and society, the task could not be compartmentalized. The machinery of government as a whole, he further states, had to be involved in the development process and development objective had to inform all government polices and action.\textsuperscript{20}

Thus, when India became independent, in the view of Rajni Kothari, it faced four major tasks: national integration, economic growth, social justice and political democracy. Given its values both as a civilization and as an heir to the modern world, the paramount challenge that India faced, as per the author, was to evolve a nation out of a vast heterogeneity of social and regional entities and to do this by involving all these into a common undertaking rather than imposing something new and alien on them.\textsuperscript{21}

The point about Indian development, wrote Rajni Kothari, which gave it the character of an unprecedented undertaking, was that while economic and social change was in important respects planned and directed from above, it was nonetheless carried on within the framework of an open and undirected polity. This meant, further wrote the author, that manipulation of change in the image of a few dominant ideas got conditioned by an accelerated pace of political competition, a changing structure of power and influence and a widening base of political consultation and persuasion.\textsuperscript{22}

To enable the political system to arrange and articulate social and economic relationships into a purposive model of development was not an easy task in the view of Rajni Kothari, who says that it was slowly realized that economic development was not just an economic process and that its success depended on the progress on many fronts. Mobilising and involving masses of people in the productive process was not simply a function of the
accumulation-and-saving construct but involved such imponderables as incentives, involvement, morale, motivation, participation and articulation of demands, as per the author. These called for, Kothari further opined, a reconstruction of existing differentiations, the creation of mediating factors between macro and micro-dimensions of society and consequent patterns of response through which the traditional society had to pass in order to develop productive capacities and orientations.23

Rural Development- The Indian Scenario:

After independence, the Indian government enunciated a number of programmes to break the stagnation in the rural agricultural sector. Community Development programme as a measure of rural development was started in 1952 to initiate the process of transformation of social and economic life of Indian villages through a change in the outlook and methods of production of the rural population. It was conceived as a people's programme with avowed objective of harnessing local resources and energies of the masses for socio-economic upliftment of all. Consequently, a host of programmes in the area of agricultural development, area development, employment, social groups and so on were launched.

But, according to Kuldeep Mathur, in a matter of few years, the community development programmes demonstrated that it could not do what it had set out to do. To quote him, the development experience of about fifteen years brought into serious doubt the assumptions of the planners that strategies of growth and productivity would suffice to resolve the problems of rural poverty themselves.24

Kuldeep Mathur further writes that new perspective on rural development began the era of special schemes, displacing the comprehensive programme of rural upliftment through community development. According to him the fourth five-year plan marked the beginning
of a period when comprehensive programmes of rural development began to
give way to a segmental view of rural development as each aspect of rural life
from agriculture to health to housing to education began to the looked at in a
fragmented fashion.\textsuperscript{25}

One of the criticisms of rural development programmes in this country
from the days of community development programmes onwards, including the
green revolution technology is that many a time most of the public efforts and
public investments benefited the relatively better-off sections of rural society
to the exclusion of the very poor.

It is said that to have programmes, projects and schemes exclusively
meant for the rural poor could be an effective way of ensuring that the benefits
reach the target groups. At the same time, it is also said, this approach faces
the danger that the projects and schemes under this programme may not get
properly integrated with the resource endowments, economic activities and
market forces of the area.\textsuperscript{26}

R.K. Rath feels that despite the acclaimed advantages of devolution of
power and decentralisation of planning later on, and repeated commitments
made to these aims, the planning process in India, remained a highly
centralised exercise. He says that its nature was bureaucratic and mainly
financial (at best physical) in content and there has been very little serious
effort to permit planning capabilities to develop at the people's level. Even the
state plans, Rath states, more often than not consisted of mere aggregations
of departmental schemes trimmed or modified to suit the national framework
and targets.\textsuperscript{27}

As per D. Bandyopadhyya, over the years, in the name of development,
government departments proliferated like the mutation of unicells in the
earliest stage of evolution in life in the universe. And, he says, created in the
name of functional efficiency the strongly positioned vertical line departments
became dysfunctional and developmentally counterproductive. The author
states that all attempts to bring about horizontal coordination at the field level were ad hoc in nature and thus failed on many fronts.\textsuperscript{28}

Given the clearly identified goals of Indian planning it would have been natural to expect that planned efforts would yield positive results. It can be said that, if the goals aimed at, have remained largely unfulfilled, it is because of the extraordinary, it is because of the extraordinary neglect of these goals in choosing the directions of planning and public policy.

To quote Kuldeep Mathur, in initial years of India's planned development, problems of implementation took precedence and it was assumed that policies failed and/or could not achieve their objectives because bureaucracy and administration were not adequate. To quote him further, little attention was paid to the policies themselves and their appropriateness. But he says, the situation changed in the late sixties when the country was confronted with a food crisis, a resource crunch and so on, and then policies began to be assessed in relation to plan models, sectoral relationships and the global economic context.\textsuperscript{29}

Surveying the variety of perceptions about criteria for judging policy success or failure, Thomas V. Smith, in 1989, grouped the diversity under three major categories. First, is the criterion of policy design which views the policy from the perspective of its appropriateness and agreement with its objective and means. The second criterion of his deals with policy process in terms of how it is formulated and implemented within the context of policy area. The third he enumerates relates to policy achievement and concerns of effectiveness and adequacy of policy in achieving its goals.\textsuperscript{30}

To quote Kuldeep Mathur and Neerja G. Jayal, traditionally, evaluations of public policies have primarily focused attention on the dimensions of efficiency and effectiveness, which accept the officially stated goals or objectives of the policy and do not question their validity. Such assessments, the authors feel, are useful but are unable to provide

46
alternatives to the policies being pursued as efficiency criteria may only promote particular types of programmes and policies.\textsuperscript{31}

According to Kuldeep Mathur and Neerja jayal the reformulation of a policy or the formulation of an ‘appropriate’ policy, needs and concerns have to be so articulated that they become part of the policy making agenda. This, they say, is a two-step process. One step is that of aggregating needs and concern, which can be done if the people are themselves aware of what their needs are and how they can be met. The second step they state is to articulate these needs so that they become part of the agenda for policy-making.\textsuperscript{32}

In the study of developing countries, policy has tended to be used in its broadest sense, that is, it refers as often to values and social consequences as to processes and choices. Further, policy tends to be seen as synonymous with state activity.\textsuperscript{33}

Stuart Corbridge is of the view that the main stream in development studies and policy is probably best characterised by its commitment to making effective states and effective markets work in tandem by means of efficient local institutions. The new mainstream is also more attentive to gender and environmental issues than it was in the recent past. It can thus be fairly argued, he says, that development studies does learn from its past from its mistakes and from its successes.\textsuperscript{34}

**Role of Irrigation in Agricultural Development:**

The role of agriculture in economic development is a recurrent subject in economic literature. Classical economists, particularly David Ricardo, having underlined the role of food supply as a crucial factor in determining economic growth.\textsuperscript{35}
Prior to the modern stage of economic development, the bulk of economic activity in most societies was normally concentrated in agriculture. The importance of this sector has therefore been long recognised for initiating and sustaining economic growth. Traditionally, following Kuznet's, 1965, classic analysis, agriculture's contribution to economic development has been thought to be in the following areas: (a) providing surplus labour to industry and other sectors of the economy; (b) supplying food to the non-agricultural labour force and agricultural raw materials to industry; (c) providing savings and capital resources for the development of industry and other economic sectors; (d) earning foreign exchange needed for industrialisation, infrastructural and other investment projects; and (e) providing a market and demand for the goods and services produced by the non-agricultural sectors. Kuznets also argued that a rise in productivity in agriculture is a pre-condition for economic growth and structural change since only than can agriculture generate a surplus and be in a position to fulfil its developmental tasks. 36

In developing countries, agriculture forms the most important industry with typically 40-60 percent of the Gross National Product derived from agriculture and employing 50-80 percent of the labour force. 37 We can say that in such countries, agriculture is the life-blood of the nation and has not only economic but deep political and social impact too.

Thus, the importance of agriculture in the development of such an economy can hardly be over-emphasised. As the total product of an economy is the sum of the products of various sectors, a rise in the output of agriculture itself represents a rise in the total national product. This has been termed as the 'product contribution' by Kuznets. 38

The agricultural objectives of the development plans are generally derived from such overall objectives of increasing the national income, reducing inequalities in income distribution, improving the balance of payments and creating employment opportunities. Broadly speaking the main
elements in agricultural planning are, planning the use of land, water and energy; determination of targets both long terms and short-terms; linking up of developmental programmes and government assistance to production targets and land – use plan and lastly, an appropriate price policy, according to, second Five – Year Plan Report, Planning Commission, Government of India.\textsuperscript{39}

The economic history of the now developed economies visibly demonstrates that improvement in agriculture preceded and paved the way for accelerated development of industry, transport and other non-agricultural activities. Diversity among nations in their physical endowment, cultural heritage and historical context precludes any universally applicable definition of the role that agriculture should play in the process of economic growth. Nevertheless, certain aspect of agriculture's role appear to have a high degree of generality because of its special features that characterise the agricultural sector during the course of development. In both capitalist and socialist countries agriculture has provided labour force, food and raw material and above all the much needed capital in the early stages of development.

According to the World Development Report 1982, "one point emerges very clearly from the diversity of experience of the developing countries: rapid growth in agriculture and in GDP go together ------ success in agriculture strengthens and helps sustain the momentum of the whole economy."\textsuperscript{40} Thus it is hardly conceivable that an adequate rate of growth in total output can be realized for a sustained period unless agricultural output is increasing at a somewhat greater rate than the growth in population. On the other hand a populous agricultural sector may provide needed market for industrial output of consumer goods and finally highly productive agriculture depends on inputs originating outside the agricultural sector. To mention a few developing countries where agriculture has contributed significantly to economic growth, we may look upto Taiwan, South Korea and certain developed states of India like Punjab and Haryana.
As is often said agriculture in India is the life blood of the nation and the mainstay of Indian economy. Agriculture is the largest sector of economic activity and contributes about fifty percent to the national income of India. It plays a crucial role in the country’s economic development by providing food and raw materials and employment to a large proportion of the population. Therefore, stability and growth of predominantly agricultural country like India, largely depends upon agricultural development. It can be said that being the largest economic activity, agriculture serves as the index of country’s economic development.

**Indian Agriculture – An Overview:**

Indian agriculture, prior to the last quarter of 19th century, was almost of subsistence type. The villages were more or less self – sufficient and production was mainly for consumptions. The growth of production and productivity was stagnant. Some date of production and productivity available before independence reveals that there was very little rise in output.

With respect to agriculture, the principal objective of the British consisted of the transformation of the Punjab region into the breadbasket of South Asia by means of heavy investment into irrigation facilities. Despite this effort, the last three decades of the Raj were characterised by stagnating agricultural production, according to, M. Zarkovic.41

Under these conditions of overall stagnation and inadequate agricultural production, it is understandable that independence in 1947 was accompanied by enthusiasm for the transformation of rural areas. The community development projects, initiated in 1951, which proliferated throughout the country, reflected an effort to engage the local population in the development effort, and transform the rural areas through self-help.

Thus, a concentrated effort was made to develop agriculture with the starting of the era of planning in India. The government launched the first five
- year plan in 1950-51 with a great emphasis on agricultural development and it was expected that a poor agrarian economy would transform into modern self-generating economy in a period of two to three decades.

Therefore recognising and realising the urgency of developing agriculture, the planning commission rightly accorded top priority to agricultural development including irrigation and power in the first five-year plan.

From time to time, different strategies have been adopted in India in an effort to revamp Indian agriculture. Among others they include cooperative farming, community development, intensive agriculture district area programme, high yielding varieties programme and integrated rural development.

Nonetheless, the main features of Indian agriculture are low productivity and backwardness. These are due to the small size of holding, technical constraints, institutional drawback, poor extension services etc. Small and marginal farmers are also the predominant features of Indian agriculture.

More over Indian Agriculture is still regarded as a gamble in monsoons. Where rainfall is plentiful and regular over the year, there is no problem of irrigation but where it is scanty as well as uncertain, assured irrigation is required to maintain the tempo of agricultural production every year. But lack of assured irrigation facilities in many areas deters agricultural production. The available assured water is also not uniformly distributed over all the places. Plus, lack of adequate irrigation facilities restricts the possibility of double or multiple cropping which in turn results in low productivity per unit of land and seasonal unemployment for as many as four to five months (or even more) in a year.

Another feature of agriculture in India is the existence of underemployment. Due to lack of farm inputs and in the absence of
progressive farm practices, farmers do not operate their land intensively and this results in underemployment on the farm. Indian agriculture is dominated by family farms where, instead of an individual, the family is the unit of employment. This naturally results in disguised unemployment because apparently all these people do not contribute to production though they seem to be busy in agriculture.

During the 1960s there was a change in the agricultural sector which was to have a profound effect on production, the food crisis and income distribution in many developing countries. Thus the High Yielding Varieties (HYV) of wheat and rice seeds, developed in Mexico and the Philippines, was also adapted to the Indian setting. The introduction and proliferation of these seeds became a priority of agriculture in the fourth (1969-1974) and fifth five-year plans (1974-1979). Although the resulting "green revolution" consisting of new varieties of many crops, it is only rice and wheat that are relevant in the Indian context, insofar as their potential, as well as their success, was the greatest.

It can be said that the introduction of HYV of seeds in 1966 was a landmark in Indian agriculture. The new strategy, often referred to as 'green revolution" proposed to make a new technological breakthrough in India which comprised the introduction of new and HYV of improved seeds, increased application of the recommended doses of fertilizers and extension of the use of pesticides so that the crop produced can be saved from destruction from insects. It was expected, according to F. R. Frankel, that modern science and technology could breakthrough India's long closed circle of poverty to spearhead an agricultural take-off that would provide the missing momentum in rural resources and demand for rapid industrialization.42

It must be mentioned that the green revolution has been condemned to further exacerbate the already unequal distribution of wealth and productive assets existing in developing countries. With increased use of technology, the
gap between the small and large farmers tends to grow, as well as between the landlord and his tenant. Simultaneously, the gap between geographical regions increases. Despite this, there is no consensus that the net social effect was negative because of the enhanced food availability which has contributed significantly to the improvement of the rural existence. Thus, the characterization of the green revolution as a success or failure depends upon which of the above aspects is deemed primary, according to Zarkovic.43

In sum, it can be said that four goals have consistently underlined Indian agricultural strategy, although their relative importance have been in a flux. These are: the achievement of a targeted level of growth, the elimination of unemployment, the eradication of poverty and the attainment of self-sufficiency in food. While there is no doubt that the total number of workers in agriculture has increased over the years, the population expansion was so great that the rural participation rate rarely increased. One result of this mounting pressure on agriculture to provide livelihood for increasing number of people is the persistence of poverty. The overwhelming evidence indicates that, with respect to the elimination of rural unemployment and poverty, socio-political factors have prevented the realization of efforts to aid the weaker sections. Too often, the wealthier farmers have reaped benefits of governmental efforts. The structural distribution of land and assets is in their favour, which tends to go hand in hand with political and bureaucratic power. It has thus been argued repeatedly that in the absence of a major change in the power structure, as well as property relations, little progress can be made in the achievement of these goals.

Nonetheless, it is incorrect to view the Indian agricultural situation with either extreme gloom or exhilaration. Progress has unequivocally been achieved in the attainment of some goals but progress is often accompanied by a new set of problems which must be addressed against the backdrop of ever increasing rural populations whose demands on the economy represent a drain rarely offset by their positive contribution.
Any appreciable progress in agricultural production essentially depends on the quantum of availability of irrigation facilities because water is the key input and without it all other inputs are either ineffective or much less effective. Development of irrigation is, therefore, the sine-quo-non for agricultural prosperity and general economic well being of the population in a country like India.

Towards Defining Irrigation:

Irrigation, it must be noted, does not constitute any independent commodity-producing sector but is an important infrastructure (defined as the basic services or public utilities, which are necessary to the commodity producing sector of the economy) of the agricultural sector. Thus, the role of irrigation is derived from that of agriculture.

Irrigation is much discussed but seldom clearly defined. To some it may mean frequent and regular application of water, to other as little as one annual watering may merit being called ‘irrigation’. A wide definition by Wiesner, is therefore more useful: irrigation is the practice of applying water to the soil to supplement the natural rainfall and provide moisture for plant growth.44

According to J.S. Kanwar, the fundamental objective of irrigation as of all development, is to improve conditions and quality of life, especially for those who are poor. On individual irrigation systems, this can be achieved through enhancing productivity of water, improving equity of water distribution, maintaining long-term environmental stability and adopting measures to maximize positive and minimise negative effects on the quality of life.45

There are basically three irrigation strategies, according to Chris Barrow, where rainfall is low and the bulk of crop needs must be met, complete irrigation is practiced; where rainfall is usually adequate but improved quantity, quality and intensity, i.e., more than one crop a year or
crop diversification is desired, supplemental irrigation may be used, where there is a risk of inadequate rainfall, protective irrigation, i.e., the application of water when drought threatens to damage a crop, may be used to improve the security and yield of harvest.\textsuperscript{46}

In the view of B.D. Dhawan, in all probability, it was the protective motive which triggered off the development of irrigated farming in low and medium rainfall regions of the world, whereas the desire to augment crop output though an additional irrigated crop in the dry season arose much later in the history of humankind.\textsuperscript{47}

Thus, broadly speaking, we can put the benefits that irrigation confers to agriculture, under two categories, namely, protective and productive. The protective role lies in that it protects the crop from failure for want of water. The productive role arises when as a result of irrigation, agricultural practices undergo several changes such as cropping pattern, intensity etc., which add to agricultural output.

D. Jha says that as irrigation bridges the gap between rains and protects the crop failure for want of water, it thereby imparts an element of stability and certainty to the crop output. Thus, the greatest benefit of irrigation is the sense of security engendered in the minds of the farmers and stability of agricultural business which an irrigation system confers on the area irrigated.\textsuperscript{48}

While playing this stabilising role, irrigation adds to the farm output as well. To quote K. Ranjit Sao, "in such cases average yield over the years increases while inputs other than irrigation remain more or less as before and only the irrigation network spreads."\textsuperscript{49} This happens on account of two factors, according to Indadeo Sharma, (i) timely sowing and watering, and (ii) stability of crops.\textsuperscript{50} With the provision of irrigation facilities, agricultural operations are carried out in time which add to the output.
The provision of irrigation facilities not only provides insurance against droughts and stabilises output but also brings about some significant changes in the agricultural practices. In areas like Rajasthan in India where the rainfall is very low, provision of irrigation has brought large tracts of land in the desert under cultivation.

Moreover, according to I. Sharma, in the absence of irrigation, especially in areas with low rainfalls, such crops are grown which require less amount of water, even through they are less productive, such as millets, gram etc. The provision of irrigation naturally leads to a replacement of these crops by those which require relatively more water, such as paddy, sugarcane, cotton, wheat etc., but are more productive.51

Even in areas with sufficient rainfall, the distribution of rains over different months of the year is not uniform. (For eg. the short of Bihar in India receives about eighty percent of rainfall during the four rainy months with the rest of the year being almost dry). Crops can be grown during the dry months only if irrigation is available. This leads to double and multiple cropping in place of single cropping.

More recently, the favourable impact of irrigation on creation of additional rural employment for agricultural labourers and self-employed family workers of the cultivating households is being highlighted, according to T. Satpathy. While irrigation operation itself needs labour, he says, its availability generates on-farm employment through increased cropping intensity and adoption of improved and labour intensive cultural practice like transplantation, line sowing, application of manures, fertilisers and pesticides.52

Robert Wade distinguishes is four phases of irrigation: control of the water source (e.g., control of the outlets from the distributary), delivery from the source (e.g., outlet) to the fields, application from field boundary to crops and drainage. At each phase, four tasks may have to be carried out: building
of structures, maintaining structures, operating structures and allocating water and finally resolving water conflicts.53

According to Robert Wade, the first phase of irrigation, 'control of water source', lies generally in principle with the irrigation department. The last phase, drainage, is relatively simple because more or less there is no specific infrastructure or organisation for drainage as such. The third phase, 'application to crops', is kind of straightforward in that what happens at does not involve any or much cooperation or coordination with other farmers. At the second phase, i.e., 'delivery from outlet to filed', the social organisation of irrigation is concentrated, though it is much more involved in the first phase (control of the outlets and distribution within the main system) than the government rules generally allow.

Irrigation institutions and more specifically the relation between irrigation and general political authority, has attracted much attention from social scientists and historians since long. According to A. Vaidyanathan, more than a century ago Marx had suggested that the apparent peculiarities of Oriental society, which had been noted even earlier by classical economists like Mill, may have something to do with the technical and organisational compulsions of water control. Weber had also postulated a similar connection between the necessity for irrigation and the important role of the bureaucracy in ancient Egypt, West Asia, India and China.54

In recent decades, the role of water control in agricultural development has come to attract more and more attention. That expansion and improvement of water control facilities (and in particular irrigation) has a crucial role in increasing agricultural production in densely populated developing countries, is by now common place wisdom. Most countries in Asia attach great importance to rapid development of irrigation and flood control and have spent massive amounts for this purpose.
Vaidyanathan further says that in contemporary times the state everywhere plays a prominent role in planning, regulating and assisting the development of irrigation, flood control and drainage project. The extent of its direct involvement in the process however, varies. In India, for instance, the national and state governments bear a much greater direct responsibility than most other countries in Asia.

Thus, it is not uncommon for water supplies to be allocated by either a government agency (an irrigation department, a regional authority or a body responsible for a particular canal or irrigation project) or an aid agency. Where there is fairly contiguous, large scale irrigation, management by, say, a canal command area authority can be effective.

Unfortunately, according to D.W. Bromley, a common characteristic of such agencies is that employees who administer the allocation of water supplies usually do not farm themselves, indeed they may know very little about the practice of cultivation and have only a limited understanding of the farmer’s irrigation need (and sometimes a lack of interest in those needs). Commonly there are poor communications between farmers and supply/irrigation development authorities and often poor liaison between water supply irrigation development and other managers.

Nonetheless efforts have been made to improve the management of water allocation in many countries. For example, in India although canal irrigation is widespread and has had a long history, in the 1970s it was often inefficient (and in many places still is). Anxious to ensure that existing canal-supplied irrigation systems functioned better and new developments fared better, the Indian government decided in 1973 to create Command Area Development Authorities, which were to be powerful organisation and management bodies each with a single line of command able to integrate the various functions involved in canal supplied irrigated agriculture.
Social scientists tend to see the poor performance of irrigation schemes as stemming from the unresponsiveness and inefficiency of over-centralised management bureaucracies and the solution to such difficulties as laying in developing new organisation structures and management methods which encourage a greater degree of participation in decision-making by the cultivators, in the opinion of Chris Barrow. Frequently, greater delegation of responsibility to local communities for day-to-day organisation and the creation of support organisations do result in more efficient water use and better crops, he says.

Thus, development of irrigation is considered the principal means of removing climatic constraints, enhancing agricultural production and improving the lot of the farmers. And with a view to increasing the productivity of areas which are mainly rainfed India is striving hard to bring maximum area under irrigation.

So, it is an established fact that agricultural activity is not only a means of earning livelihood but a way of life in the Indian context with the agricultural sector being the most predominant. So obviously, as we have seen, agricultural planning will be the core of overall planning in India. Hence, the level of efficiency and productivity in agriculture to a certain extent determine the efficiency of Indian economy. Thus, rural development depends on the agricultural development of the nation. And, for the development of agriculture, the availability of water, dependable and in sufficient quantity, is a pre-condition. Thus, rural development and prosperity through irrigation has been a dominant theme in Indian planning since the inception of five-year plans.

Irrigation Outline of India:

In India, irrigation forms the life-line for sustained successful agriculture. As pointed out by sir Charles Trevelyan, "Irrigation is everything in India; water is
more valuable than land because when water is applied to land, it increased its productivity at least six-fold. The massive development of irrigation in India after independence has been recognised as one of the major factors which has contributed to the spectacular rise in the production of food and fibre. Prior to the initiation of the five-year plans in 1950-51 the total area irrigated in India was 22.60 million hectare (m. ha), which increased to 52.10 mha by the end of the fifth-five year plan (1977-78). Between 1978-1980, an additional potential of 4.5 m ha was created. The aggregate irrigation potential at the end of 1979-80, the beginning of sixth plan was 56.6 m ha. The irrigation potential created up to the end of the seventh plan (1990) was 76.52 mha against the estimated ultimate potential of 113.5 mha which has now been reassessed as 139.89 mha.

About seventy percent of India's cropped area is entirely dependent on rainfall and its attendant vagaries. Every year during the monsoons, 320 million hectare metres of water descends on the Indian subcontinent. If all the water were collected, it would form a one metre thick sheet of water over our land mass. It is the largest volume of its kind that falls anywhere in the world says, Syed Farooque Azam. Inspite of this fact we have to depend on irrigation because about ninety five percent of the total rainfall occurs in a short period of three-four months, i.e., in July-September. Half of the rainfall occurs in twenty percent duration at any place. This rain occurs in the form of heavy showers. The major consequences of such a situation are that during seven-eight months of a year, large tracts of the country are rainless. And even during the rainy season there are long dry spells in between. In our country, development of irrigation in the past had taken place as a measure of famine relief. In India, in fact, famines gave birth to the idea of irrigation.

The purpose of irrigation in the pre-independence period was to stabilise agricultural output. The irrigation system was then not developed in totality. The role of government was confined to provide water upto outlets for distribution. The conveyance of water to fields and application was the
responsibility of the farmers. And so, irrigation was looked upon as stabilising agriculture rather than modernising it.

The need to accelerate irrigation development in an effort to augment food supplies was felt immediately after partition. Several large river development projects such as Bhakra – Nangal, Damodar Valley river project and Hirakund Schemes were taken up between 1947 and the start of the first five-year plan.

Planning era began with the setting up of planning commission in 1950 in India. In the first five-year plan which commenced in 1951-52, agriculture and its development formed the main theme. Naturally irrigation development to augment agricultural output was assigned crucial role. Irrigation development was crucial, judged from the limited scope for expansion of cultivated area.

In the absence of irrigation, the soil and climatic conditions of India permit the production of a single crop in the whole agricultural year from most of the arable land resource. This is aptly brought out by the fact, according to B.D. Dhawan, that in the mid-seventies the national average for intensity of cropping on farm holdings without access to irrigation was about 112 percent only. This estimate is based on data collected though a nationwide, large scale survey of over 85,000 farm households by the national sample survey organisation (NSSO, 1985). In the same survey, he says, respondents who did not have access to irrigation were asked to indicate the extent to which the land in their possession needed no irrigation at all. Such land barely constituted four percent of the total land area, underlining the felt need for irrigation in this country.62

The productive motive, according to B.D. Dhawan, dominates the development of irrigation in India. The aim he says is not only additional cropping during the dry season but also a substantial step up in crop yield
through the simultaneous use of irrigation, chemical fertilizers, high yielding varieties of seeds etc. 63

In 1950-51, a classification was made regarding irrigation schemes. The schemes were divided into three categories namely major, medium and minor. Irrigation schemes costing more than Rs. five crores were classified as major schemes. The schemes involving an expenditure between Rs. five crores and Rs. ten lakhs were categorised as medium irrigation schemes. Minor irrigation schemes involved an expenditure less than Rs. 10 lakhs. A revised classification of irrigation schemes was adopted in April 1978. It has been in vogue since then.

According to this new classification, projects having Culturable Command Area (CCA) of more than ten thousand hectares each are classified as major projects. Those projects with CCA between 2,000 to 10,000 hectares are classified as medium ones. Finally, the scheme involving CCA of less than 2,000 hectares are categorised as minor schemes. 64

Arun Kumar states that every year the planned development process is adding on hectares to the created irrigation potential and the progress made by the country in developing irrigation infrastructure has been slow but steady. The planning commission revised the ultimate irrigation potential to 139.89 million hectare and till the completion of the eight five-year plan, the achievement was recorded to be 89.56 million hectare. In all, there are 162 major, 240 medium projects and 74 extension/ renovation / modernisation schemes with an aggregate estimated cost of over 1,26,318 crore and a spill over cost of Rs. 79.321 crore spilled over from previous plans into the ninth plan. 65

Notwithstanding the remarkable increase in the development of irrigation potential, there has been tremendous under-utilisation of the created potential. High conveyance loss of water, lack of equity, adequacy and reliability of water supply, wastage of water by over-irrigation by farmers,
excessive exploitation of ground water in fresh and marginal zones, increase in operational maintenance expenditure coupled with poor maintenance because of lack of funds with the agencies, limited increase in irrigation efficiency, excessive weed growth and silting in the carrier channels and traditional cropping patterns are said to be some of the hallmarks of India's water irrigation sector.⁶⁶

According to M.V. Nadkarni, the under-utilisation syndrome in unique to major and medium projects. While much attention was paid to the construction of reservoir and the canal system, little effort was made in developing on-farm water management facilities, he says. Further, he says that the supply of inputs such as power, fertilizers, plant protection, chemicals and farm implements was not adequately arranged most of the time, for a switch over from rain-fed agriculture to irrigated farming. Plus, he says, cost escalations and time over-run have been common to major and medium projects in India, upsetting economic calculations.⁶⁷

It must be mentioned that minor irrigation schemes comprise of all ground water schemes like dug well and tube wells, surface water flows and lift irrigation schemes. As per B.B. Vohra, the relevance of minor irrigation to country's agricultural programme is obvious. This becomes clear when considered against other forms of irrigation – major and medium. Canal irrigated lands produce 1.7 tonnes of food grains per hectare as against the expected four to five tonnes per hectare. The productivity of canal irrigated land, he says, is much less compared to the overall average. The overall higher average is attributed to the efficiency of ground water irrigation.⁶⁸ Minor irrigation works have been the backbone of agriculture throughout the history of India.

Minor irrigation works is said to have a short gestation period. They can be executed with comparatively small initial outlay and they are supposed to yield quicker results because irrigation water flows immediately after the
completion of the work. Further, minor irrigation works can be executed without much of specialised technical skill with the help of local resources and equipment. These works also provide a large amount of dispersed employment among the local people. People's participation could be counted upon for the construction of these minor works. The government's commitment by way of expenditure on these works is relatively small. This is because a fairly high proportion of these works are privately owned or owned by local groups or bodies.

While there is hardly anyone who is vocally opposed to the very idea of irrigation, there are two main strands of criticism about the impact of Indian irrigation. One revolves around some sort of crisis of expectations. Ever since the end of the first decade of Indian planning it has been widely agreed that the growth of Indian agriculture virtually hinges on our ability to continuously raise the yield levels of various crops. In this context, irrigated farming has been a source of disappointment to many, especially those who are aware of the high yield levels attained elsewhere (for example, five to six tons of rice yields per irrigated hectare in Far Eastern countries as against nearly two tons in India). Another area of dissatisfaction is the unsatisfactory protective cover afforded by Indian irrigation during the drought years. Likewise, the contribution of irrigations to increasing the intensity of cropping is viewed by many scholars as being well below expectation.

The other line of criticism centres round the unintended consequences of irrigation. Particular mention in this regard need be made of the following aspects:

1. The waterlogging and land salinisation problems within canal commands.
2. The depletion of the water – table in tracts witnessing rapid development of groundwater irrigation.
3. The widening of income and wealth disparities between dry and
4. Irrigated tracts or between farm classes within an irrigated region.

5. The adverse output impact of irritation on the growth of pulses, oilseeds and coarse grains.

6. Rising cost of developing major and medium canal irrigation projects.

7. Declining use of tank irrigation because of serious reduction in the watershed areas of tanks and silting up of tanks.

Thus, according to experts, some of the important issues which will have to examined closely in future strategy of irrigation development are: (i) choice between large and small irrigation work, (ii) cost and time overrun in the completion of major and medium irrigation schemes, (iii) efficiency in the operation of such schemes, (iv) underutilisation / misutilisation of the irrigation potential, (v) quality of irrigation, (vi) productivity impact, (vii) financing of irrigation management, (viii) pricing of water, (ix) equity impact and (x) environmental concerns.

Inspite of everything irrigation continues to be the kingpin of agricultural planning in India. The irrigation cover of Indian crop sector is said to have almost doubled since 1947, with one-third of total crop area estimated of being irrigated as of today. No wonder, the impact of such a rise in irrigated farming on the farm economy itself, as also on the rest of the economy, on Indian society and on Indian ecology, has been noteworthy.

According to C H Hanumantha Rao, in the last two decades, the country has been faltering in its efforts to augment water resources, even as the use of the available water resources has become increasingly unsustainable. Public investment, he says, in major and medium irrigation schemes has been declining, in real terms, throughout the 1980s and 1990s, even though as much as forty percent of the potential still remains to be exploited.69
Thus, the level of efficiency and productivity in agriculture to a certain extent determines the efficiency of Indian economy. And for the development of agriculture, the availability of water, dependable and in sufficient quantity, is a precondition. Hence, rural development through irrigation has to be the core of overall planning in India.

**Command Area Development Programme:**

There was a marked expansion of irrigation facilities aimed at improving agricultural production from irrigated land to meet the food sufficiency needs of the nation in view of the fast growing population during the post-independence period.

Several irrigation projects were completed and the irrigation potential which stood at 22.6 mha in 1951 reached to about 33 mha by mid sixties heralding the green revolution. It reached to about 90 mha by the year 2000.\(^70\)

However, a phenomenon of stagnation in food grain production was observed in early seventies. The study and subsequent analysis made by Irrigation Commission, 1972, Committee of Irrigation Ministers, 1973 and Planning Commission, 1973, felt that there was a big gap between irrigation potential created and utilised and the yields obtained under irrigated agriculture in India were still substantially lower as compared to other countries. The main reason for low productivity was realised to be lack of integrated and coordinated approach to irrigation water utilisation at farm level for obtaining optimum production from irrigated land. In order to utilise the irrigation potential created in an optimum manner, a centrally sponsored command area development programme was started in 1974-75 for systematic development and management of command areas of irrigation projects to optimise agricultural production for bringing sustainability.

The CAD programme aims at reducing the gap between irrigation potential created and utilised and optimising the agricultural productivity and
production from irrigated lands in a coordinated manner and on a sustainable basis. The programme endeavours to implement/propagate all available technologies for scientific management of land, water and crop for sustainable optimum agricultural production. The integration of various activities related to irrigated agriculture is envisaged to be achieved through multi-disciplinary teams under a command area development authority organisation. 71

Programme Contents:

In order to take up scientific water management under the selected irrigation commands, following components and activities were incorporated in the programme:

(1) On-farm development work:

a) Development of field channels and field drains within the command of each outlet.

b) Land levelling on an outlet command basis.

c) Realignment of field boundaries wherever necessary (where possible, consolidation of holdings also to be combined).

d) Enforcement of a proper system of 'Warabandi' and fair distribution of water to individual fields. (Through promotion of farmer's participation in the management of irrigation water and improving communication system including wireless for distribution of water for its better use by farmers).

e) Reclamation of waterlogged areas.

f) Supply of all inputs and services, including credit.

g) Strengthening of extension services.

(2) Selection and introduction of suitable cropping patterns. (Through adaptive trials, demonstration and training).
(3) Development of ground water to supplement surface irrigation (conjunctive use of ground and surface water). This is done through coordination with related departments. However, subsidy to small and marginal farmers is given for groundwater development, sprinkler and drip irrigation.

(4) Development and maintenance of the main and intermediate drainage system. (Through coordination with irrigation department).

(5) Modernisation, maintenance and efficient operation of the irrigation system upto the outlet of one cusec capacity. (Through irrigation department).

(6) Increase the production and productivity of agriculture through appropriate coordination among different disciplines and departments. (Through coordination with the line department which are not under CAD authorities. Adaptive trials, demonstration and training under CAD programme particularly on efficient water management help in this direction.

(7) Monitoring and evaluation for mid term correction/improvement. (Through monitoring and evaluation cells and field visits by concerned officials and consultants).

The core components of CAD programme are however, construction of field channels and field drains, land levelling and shaping and enforcement of Warabandi for fair and equitable distribution of water to individual fields.

Initially 60 irrigation projects were taken up under the programme, covering a culturable command area of 15 million hectare. By 2000 there were 1453 major and medium projects in the country. The total ultimate irrigation potential was 139.9 mha which include minor irrigation potential also. The programme was in operation in 236 irrigation projects spread over 28 states and 2 union Territories and covering a CCA of 22.72 mha by 2000-01. The programme also includes minor irrigation projects and clusters of minor irrigation projects of hilly states.
Programme Administration:

**Organisation at National Level:** The Command Area Development Wing of the Ministry of Water Resources coordinates and monitors the implementation of the command area development programme at the national level. The responsibilities of the CAD wing include: (i) monitoring of the physical and financial progress, (ii) release of central assistance to states according to the financing pattern and examination of progress of works, (iii) scrutiny of plan provisions, (iv) inclusion of new projects and deletion of projects completed, (v) preparation of technical guidelines, suggesting innovations in CAD and water management activities, (vi) promoting participatory irrigation management, (vii) training of farmers and officials in CAD related activities and (viii) taking up action research programme, adaptive trails, demonstrations etc. in the farmer’s field.

**Organisation at the State Level:** The organisational structure at the state level varies from state to state. In some states like Jammu and Kashmir and Meghalaya the CAD programme is within the purview of the agriculture department. It falls within the jurisdiction of the water resources/irrigation in states of Andhra Pradesh, Arunachal Pradesh, Assam, Goa, Gujarat, Haryana, Karnataka, Kerela, Madhya Pradesh, Maharashtra, Manipur, Orissa, Nagaland, Punjab and Tripura. In Bihar and West Bengal minor irrigation department looks after the programme. In some states like Rajasthan, specific departments have been created for implementation of the CAD programme.

There also exists an interdepartmental coordination committee in most of the states to bring together the secretaries incharge of related departments and to ensure inter-disciplinary approach.

**Organisation at the Project Level:** The CAD programme at the project level is implemented by the command area development authorities established by
the state government for one or more commands of irrigation projects. By 200-01 there were 53 CADA in different states.77

Table 2.1

The Year-Wise Status in Respect of Inclusion and Deletion of Projects

<table>
<thead>
<tr>
<th>Years</th>
<th>Projects</th>
<th></th>
<th>On-going (cumulative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Included</td>
<td>Deleted</td>
<td></td>
</tr>
<tr>
<td>1974-75</td>
<td>60</td>
<td>-</td>
<td>60</td>
</tr>
<tr>
<td>1970-80</td>
<td>16</td>
<td>-</td>
<td>76</td>
</tr>
<tr>
<td>1983-84</td>
<td>28</td>
<td>-</td>
<td>104</td>
</tr>
<tr>
<td>1984-85</td>
<td>-</td>
<td>3</td>
<td>101</td>
</tr>
<tr>
<td>1985-86</td>
<td>31</td>
<td>-</td>
<td>132</td>
</tr>
<tr>
<td>1987-88</td>
<td>4</td>
<td>-</td>
<td>136</td>
</tr>
<tr>
<td>1988-89</td>
<td>-</td>
<td>6</td>
<td>130</td>
</tr>
<tr>
<td>1990-91</td>
<td>26</td>
<td>1</td>
<td>155</td>
</tr>
<tr>
<td>1991-92</td>
<td>4</td>
<td>-</td>
<td>159</td>
</tr>
<tr>
<td>1992-93</td>
<td>8</td>
<td>-</td>
<td>167</td>
</tr>
<tr>
<td>1993-94</td>
<td>16</td>
<td>-</td>
<td>183</td>
</tr>
<tr>
<td>1994-95</td>
<td>6</td>
<td>-</td>
<td>189</td>
</tr>
<tr>
<td>1995-96</td>
<td>4</td>
<td>-</td>
<td>193</td>
</tr>
<tr>
<td>1996-97</td>
<td>11</td>
<td>1</td>
<td>203</td>
</tr>
<tr>
<td>1997-98</td>
<td>14</td>
<td>-</td>
<td>217</td>
</tr>
<tr>
<td>1998-99</td>
<td>10</td>
<td>-</td>
<td>227</td>
</tr>
<tr>
<td>1999-2000</td>
<td>1</td>
<td>-</td>
<td>228</td>
</tr>
<tr>
<td>2000-2001</td>
<td>26</td>
<td>18</td>
<td>236</td>
</tr>
<tr>
<td>Total</td>
<td>265</td>
<td>29</td>
<td>236</td>
</tr>
</tbody>
</table>

It is said that considerable work has been done specially on core components of OFD works like construction of field channels and enforcement of Warabandi. The achievements till the end of 1996-97 being 139.52 lakh ha and 86.42 lakh ha in these activities respectively. The coverage under these activities is said to have increased to 149.59 lakh ha respectively by the end of 1999-2000.\(^7\) The progress under the land levelling and shaping has been to the extent of 21.02 lakh ha upto 1996-97 and it is said to have had increased marginally to 21.58 lakh ha by the end of 1999-2000. The achievement under land levelling is said to be low as compared to the field cannels because this activity is location specific and is not required in many projects.\(^8\) Moreover, since this activity is cost intensive and is not under the budgetary provision for grant under the programme, farmers do not find it feasible to take loans from financial institutions for its execution.

Construction of field drains has been another important item of on farm development activities, which envisages to let out surplus surface water from the fields. Till most part of the seventh plan period (upto 1982) this component was not under budgetary assistance, rather it was to be executed through loan to be taken by farmers from financial institutions.

However, keeping in review the importance of field drainage, this component was brought under the budgetary provision during seventh plan. A limitation for taking up this activity is that before taking up the field drainage work, it is obligatory that main drainage net work for disposal of surplus water to the natural out fall through the collector, intermediate and the main drain etc. should exist. However, in the later part of the eight plan this activity had picked up and by the end of 1996-97 (end of the eight plan), the achievements is said to have been to the extent of 7.73 lakh ha and is said to have had increased marginally to 9.31 lakh ha by the end of 1999-2000.\(^8\)
Table 2.2
OFD Works: Planwise Physical Achievements

(in million hectare)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Item</th>
<th>Field channel</th>
<th>Warabandi</th>
<th>Land levelling</th>
<th>Field drain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Achievements till end of 1980</td>
<td>2.80</td>
<td>-</td>
<td>1.11</td>
<td>*</td>
</tr>
<tr>
<td>2.</td>
<td>Achievement during VI plan</td>
<td>5.13</td>
<td>1.22</td>
<td>0.43</td>
<td>0.15</td>
</tr>
<tr>
<td>3.</td>
<td>Achievements during VII plan</td>
<td>3.17</td>
<td>3.74</td>
<td>0.38</td>
<td>0.42</td>
</tr>
<tr>
<td>4.</td>
<td>Achievements during 1990-91 and 1991-92</td>
<td>1.05</td>
<td>1.16</td>
<td>0.07</td>
<td>0.16</td>
</tr>
<tr>
<td>5.</td>
<td>Achievements during VIII plan</td>
<td>1.76</td>
<td>2.52</td>
<td>0.11</td>
<td>0.19</td>
</tr>
<tr>
<td>6.</td>
<td>Targets for IX plan</td>
<td>1.17</td>
<td>2.60</td>
<td>0.15</td>
<td>0.10</td>
</tr>
<tr>
<td>7.</td>
<td>Achievements during 1997-98</td>
<td>0.32#</td>
<td>0.42#</td>
<td>0.01#</td>
<td>0.03#</td>
</tr>
<tr>
<td>8.</td>
<td>Achievements during 1998-99</td>
<td>0.27#</td>
<td>0.32#</td>
<td>0.02#</td>
<td>0.04#</td>
</tr>
<tr>
<td>9.</td>
<td>Cumulative achievements till March 1999</td>
<td>14.55</td>
<td>9.39</td>
<td>2.14</td>
<td>0.84</td>
</tr>
</tbody>
</table>


*Not under budgetary provision till VI plan.

#The figures are provisional.
The physical and financial achievements under different OFD components during the VIIth plan and the last three years of IXth plan (from 1997-98 to 1999-2000) and anticipated achievement for 2000-01 and target for 2001-2002 are given as under:

Table 2.3

VIII Plan

(Unit in '000 ha)

<table>
<thead>
<tr>
<th>Item of work</th>
<th>Ultimate target</th>
<th>Achievements till VII plan</th>
<th>Target</th>
<th>Achievements</th>
<th>% Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field channels</td>
<td>22720</td>
<td>11138.67</td>
<td>1330</td>
<td>1762</td>
<td>132.48</td>
</tr>
<tr>
<td>Warabandi</td>
<td>22720</td>
<td>4957.13</td>
<td>2600</td>
<td>2526</td>
<td>97.15</td>
</tr>
<tr>
<td>Field drains*</td>
<td>*</td>
<td>423.87</td>
<td>300</td>
<td>188</td>
<td>62.67</td>
</tr>
<tr>
<td>Land levelling &amp; shaping*</td>
<td>*</td>
<td>1922.57</td>
<td>400</td>
<td>117</td>
<td>26.75</td>
</tr>
</tbody>
</table>

Source: Report of the Working Group on CADP, 2001.\(^{83}\)

*Location specific activities and hence ultimate targets are not available.

Table 2.4

X Plan

<table>
<thead>
<tr>
<th>Item of work</th>
<th>Target</th>
<th>Achieving</th>
<th>% Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field channels</td>
<td>950</td>
<td>1476</td>
<td>155.37</td>
</tr>
<tr>
<td>Warabandi</td>
<td>3000</td>
<td>1500</td>
<td>50.00</td>
</tr>
<tr>
<td>Field drains</td>
<td>100</td>
<td>229</td>
<td>229.0</td>
</tr>
<tr>
<td>Land levelling and shaping</td>
<td>-</td>
<td>79</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Report of the Working Group on CADP, 2001.\(^{84}\)
Targets for land levelling and shaping depends upon the topographic / site conditions. As such, they are not fixed.

Continuous upgradation of knowledge and skills of field functionaries and farmers is essential for effective programme inspite mention Training, is therefore, a very important activity under the CAD programme. The ministry of water resource provides central assistance on matching basis to state for training of officials and farmers for implementing the CAD programme including participatory irrigation management and reclamation of waterlogged areas in irrigated commands. However, for training to semi officer level officers cent per cent expenditure is borne by the central government.

During the IXth plan on amount of Rs. 840 crore was provided for different components. As against this the actual releases during 1997-98, 1998-99 1999-2000 and 2000-2001 has been 126.48 crore, Rs. 173.34 crore, Rs. 162.95 crore and Rs. 142.15 crore respectively on the basis of funds provided under revised estimate. However, the total central releases from 1974-75 to 2000-01 to the state is Rs. 2285.67 crore. 85

In states like Andhra Pradesh, Uttar Pradesh and Bihar, the department of irrigation remains outside the authority of CAD. There is a strong case, nonetheless, for operations, maintenance and water utilisation aspects of the irrigation department to be brought under the authority. However, according to K.K. Singh, the opinion on the issue is fairly divided and runs along divisions. The irrigation officers, he says, by and large, are opposed to the idea and the CAD administrators, by and large believe that without the representation of the irrigation department, the CAD organisations will not be able to serve the farmers. 86 Rajasthan, Gujarat and Maharashtra are said to be examples where irrigation department functions under the authority although the amount of control exercised over the department personnel varies considerably.

74
Rakesh Hooja says that despite the differences from state to state in the extent to which the CAD approach is applied and to which the CAD organisation is integrated into a unified and comprehensive set up, the fact that the CAD approach exists itself provides hope for the future of water management in India.

Sivamohan and Scott (1992), feels Rakesh Hooja, have rightly pointed out that India's command area development programme concept is unique: aiming to integrate a very wide range of developmental, sectoral and functional components and sub-components through articulation of a comprehensive strategy of development which includes desperate fields previously thought to be unrelated to irrigated agriculture.

**CADA and Participatory Irrigation Management:** In 1987, the national water policy strongly advocated that farmers should be progressively involved in the distribution of water, operation and maintenance of the conveyance system and the recovery of water rates. In the same year, the ministry of water resources issued guidelines to the state government for forming farmer's associations and empowering them to collect water rates. The Vaidyanathan committee, which was set up by the planning commission in 1991 to study the pricing of irrigation water, also recommended the need for farmer's participation in the management of the irrigation system.

By the end of 1998-99, 6369 water users associations covering an area of 2.69 mha were formed in different projects covered under CAD programme. Under the CAD programme provision was made for payment of a one time functional grant as management subsidy to farmer's associations at the rate of Rs. 500 per hectare, of which an amount of Rs. 225 each to be given by the Union government and the state government respectively and the rest Rs. 50 to be given by the farmers associations.
The ministry of water resources had been taking up several steps to promote the concept of PIM. These include:

i) Organisation of national, state and project level conferences with the participation of officials, NGOs and farmers.

ii) Preparation of manuals and circulation of the same to states for implementation of PIM.

iii) Preparation of guidelines for amendments in the irrigation acts and circulation to the states to give legal statues to WUAs.

iv) Holding of training programmes, and

v) Provision of one time functional grant at the rate of Rs. 500/- per hectare for formation of WUAs.91

This amount of Rs. 500 per hectare given where farmers associations are registered and engaged in distribution of water at the outlet level, is shared in the ratio of Rs. 225/- by the centre, Rs. 225/- by the state and Rs. 50/- by farmer's association respectively. This amount is put in the bank as a fixed deposit and interest accrued thereon is to be utilised for upkeep of the system and water management.

These efforts have created considerable, consciousness about the need for farmer’s involvement in the management of irrigation at various degrees and levels.
ENDNOTE

8 Ibid, p. 3985.
12 Ibid.
19 Ibid, p. 128.
22 Kothari, Rajni, 1970, Politics in India, Delhi, Orient Longman, pp. 8-10.
30 As quoted in, ibid., p. 21.
31 Ibid., p. 22.
32 Ibid., p. 23.


Kanwar, J.S., ed., 1988, Water Management: The key to developing agriculture, New Delhi, Agricol Publishing Academy, p. 47.


Ibid, p. 4.


Satpute, T.G., 1988, Irrigation Management in Command Area, Delhi, Mittal Publications, p. 41.


Ibid.


Ibid., p. 97.

Nadkarni, M.V., 1975, "Socio-Economic Study of Villages in Jayakwadi Command," (mimo), Aurangabad, CADA.


74 Ibid.
75 Ibid., p. 9.
76 Ibid., pp. 9-10.
77 Ibid., p. 10.
80 Ibid., p. 15.
81 Ibid.
84 Ibid.
85 Ibid., p. 18.
87 Hooja, Rakesh, in Rakesh Hooja and Rod Bower, ed., 1997, Agriculture and Social Development, Delhi, Himanshu Publications, p. 34.
88 Ibid., p. 23.
90 Ibid., p. 18.