APPROACH TO POVERTY ERADICATION WITH ENVIRONMENT REGENERATION AND SUSTAINABILITY

INDIA

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INDEX

Chapter 1

Planned Approach to Environment and Development

India, over the past fifty years, is witness to a transition from a predominantly rural based agrarian society into a diversified economy. India's planned approach to socio-economic development and poverty eradication has underlined sustainability. Conservation and resource management is integral to development plans. A sound environmental policy and legal framework is also in place. Recent economic liberalization policies have seen new strides in technology upgradation, cleaner fuels, efficiencies in production and environmentally sound practices. At the same time, Indian society's traditional respect for the ecology, rivers and nature continues to remain as strongly rooted as ever.

The first and overriding priority of developing countries is economic and social development and poverty eradication. India, too, recognizes that environmental degradation has social reasons, and that combating poverty is a prerequisite for sustainable development. India's production and consumption patterns are evident from its very low per capita greenhouse gas emissions: many times lower than the world average. India, in any case, following a planned approach to development, has subscribed to the twin objectives of socio-economic growth and sustainability.

Integrating the concerns of natural resource conservation and human welfare underlines the concept of sustainable development. It has been recognised that the sustainable development approach is the key to a continuous growth of the economy India has a large number of developmental programmes aimed at improving the

quality of life of the people. Consequently there is a large scope of including environmental concerns in these programmes for almost all the sectoral developmental plans. The government of India has a firm belief that only people's participation can achieve highest level of successful implementation of existing programmes of conservation and environmental protection.

Meeting the energy requirements for the large population of our country is another area of priority. On the one hand we are making our best attempts to supplement the heavy dependence on biomass resources for rural energy and emphasizing the importance of a shift from the biomass resources for energy to commercial energy. Keeping in view the major environmental consequences of energy from fossil fuel sources, we have also taken bold steps to limit emissions by appropriate environmental impact assessments of projects and the application of environmentally sound technologies.

India's effort at creating employment through income generating assets has been spearheaded by the provision of self-employment opportunities to more than 50 million rural households. The endeavour also recognizes that controlling land degradation is central to achieving food security, sustainable forestry and rural development. Integrated watershed management, soil conservation, desert development programme and drought prone area programmes are important components of this strategy.

Policy Initiatives in Environmental Protection

The government has enunciated its policy in the form of policy statements on Forestry, on Abatement of Pollution, and also through the comprehensive National Conservation Strategy and Policy Statement on Conservation and Development. In addition, there are laws for the protection of environment, the most well known being the Wildlife (Protection) Act, 1972, the Forest (Conservation) Act, 1980, and the Environment (Protection) Act, 1986. The National Forest Policy, 1988 recognises the ecological role of forests and emphasizes the need to restore the ecological balance and the conservation of the country's natural heritage by preserving the remaining natural forests. This objective is sought to be achieved through the prevention of soil erosion and denudation in the catchment areas, the restriction of the growth of desert areas, and the evolution of a system to meet the requirements of fuelwood, fodder, non-wood forest products and small timber of the rural and tribal population. The National Conservation Strategy and Policy Statement of Environment and Development, adopted in June 1992, provides the basis for the integration and internalisation of environmental considerations in the policies and programmes of different sectors. It also emphasizes sustainable life styles and the proper management and conservation of resources. The Policy Statement of the Abatement of Pollution, 1992, states the Government's commitment to prevent further deterioration of the environment. The policy elements seek to shift the emphasis form defining the objectives for each problem area towards the actual implementation, and the focus is on the long term. The statement recognizes that pollution particularly affects the poor, the complexities are considerable given the number of industries, organisations and government bodies involved. To achieve the objectives, maximum

use would be made of a mix of instruments including legislation and regulation, fiscal incentives, voluntary agreements, educational programmes and information campaigns.

Environmental Policy and Legal Framework

The statutory framework for the environment includes the Water (Prevention & Control of Pollution) Act, 1974 the Air (Prevention & Control of Pollution) Act, 1981, the Forest (Conservation) Act, 1980 and the Environment (Protection) Act, 1986. In India, matters of public interest, particularly pertaining to the environment, get articulated effectively through a vigilant media, an active NGO community, and, very importantly, through the judicial process which has recognised the citizen's right to a clean environment as a component of the right to life and liberty.

Prevention of adverse Environmental Impacts

Economic deregulation has propelled infrastructural and industrial development. The balance between development and the environment is addressed through the environment impact assessment methodology. This takes into consideration the need for development and the imperative of protecting the environment. The assessment reports cover the impact of the development project on ambient air and water quality, land degradation and the ecology. Standards have been established for pollution discharge. Development projects have to be supported by environmental management plans. In the furtherance of transparency in the project appraisal process, public hearing has been made mandatory for critically polluting

activities. In the process of public hearing, relevant project documents and environmental impact assessment reports are made available to the public at designated places and through newspaper inserts. Suggestions made by the public are incorporated in the project design wherever possible. A monitoring mechanism has been put in place for ensuring compliance with the prescribed mitigative measures.

Natural Resources Conservation

With a geographical area spanning 329 million hectares, India is the seventh largest country in the world in terms of landmass. The systems and types of land use have been conditioned by climatic conditions, primarily expressed in terms of precipitation/rainfall received in various parts of the country. The unequal distribution of precipitation and water resources have conditioned agricultural cropping systems and systems of farming, though 'irrigation' has successfully transformed the water-short areas of Punjab, Haryana and Western Uttar Pradesh in the food bowls of India. India is also endowed with large areas of non-agricultural/non-forest land. These include common grasslands and pastures, lands occupied by inland water regimes and fallow lands. These lands have been the sources of fuelwood and fodder for the large population of people and livestock in India. Many of these lands have become degraded because of various reasons including biotic pressures. Programmes are under way to reclaim the wastelands so as to bring them to productive use to improve ecology as well as level of living. India has a very diverse forest vegetation ranging from the temperate vegetation in the Himalayas to the moist evergreen forests in North-East, the Western Coast and the Andaman & Nicobar Islands. Based on climate and predominant vegetation type,

Indian forests are classified into 16 types. A large number of rural population and almost the entire tribal population heavily depends on natural forests for their sustenance. Apart from meeting the requirements of fuel, fodder, food and fibre, the rural and tribal people also depend on forests for medicinal plants for their health and well being. These forests also serve as a source of income for the people depended on them. The procurement and selling of non-timber forest produce adds directly to the income of rural households besides providing employment opportunities in various schemes pertaining to afforestation and watershed development programmes. The forest cover of the country, as per the latest assessment of the Forest Survey of India is 63.591 m ha comprising 19.44% of India's geographical area Apart from the natural forests, man-made forests are also expanding due to the afforestation programmes initiated by the Government. The target of attaining 33% land area under forest cover as laid down in the National Forest Policy 1988 is attainable but demands stupendous efforts. Government of India and State Governments have been implementing a massive programme of afforestation. Special attention is given to degraded forests and lands adjoining forest areas. Efforts are being made to reduce the dependence of rural population on forests by promoting non-conventional sources of energy, finding wood substitutes and providing alternate sources of fuel and fodder etc. It is recognized that people's participation, particularly local communities, is the key to successful management and development of forests. Consequently, concepts of micro planning and Joint Forest Management (JFM) are not an integral part of all afforestation projects. The concept of JFM involves a shift from the earlier policy of forest management through the forest department to the involvement of village communities and NGOs in the generation, management and protection of degraded forests. The tribal and rural population has particularly benefited from this approach.

The JFM approach is now being followed in 22 States and over 7 m ha of degraded forests is under the JFM cover The tendencies towards deforestation, incidence of illicit felling and forest fires have to be checked. Steps have been taken in this regard. Diversion of forest land for non-forestry purposes has been banned through the Forest (conserves) Act, unless compensatory afforestation takes place. Steps have also been taken to create infrastructure like forest roads and to build up capacity of forest department officials to tackle the problem of poaching, illicit felling etc

India is uniquely rich in all aspects of biodiversity including ecosystem, species and genetic biodiversity. It is estimated that over 75,000 species of fauna and 45 000 of flora are found in India. A National Action Plan and a draft legislation on conservation of Biodiversity are in the process of being finalized

Major Projects on Environmental Improvement

Industrial Pollution Control Project

To tackle the problem of pollution from Industries, an Industrial Pollution Control Project was initiated in 1991 with the assistance from the World Bank (US$ 155.6 million), with the Government of India, State Governments, IDBI & ICICI and the industrial units availing the loans providing US$ 108 million The project had the following objectives:

- To strengthen the monitoring and enforcement abilities of the Pollution Control Boards of the heavily industrialized States in the country, viz. Gujarat, Maharashtra, Tamil Nadu and Uttar Pradesh.
- To get individual units to install appropriate pollution control devices.

- To assist the establishment of Common Effluent Treatment Plants for the combined treatment of effluents from clusters of small-scale units.
- To introduce clean technologies which would have a minimum generation of wastes through demonstration projects and studies.
- To support a training programme to the staff of the Pollution Control Boards and of the financial institutions involved in the project.

Due to this project the technical capacity of the State Pollution Control Boards (SPCBs) was enhanced considerably. The enhanced capacity of SPCBs is helping them to implement the pollution control Acts more vigorously. Awareness has been generated among the industries to take necessary measures to control pollution. Besides institutional strengthening, the project has also extended assistance to the industries and more so to the small scale industrial units in the form of the Common Effluent Treatment Plants (CETPs) – a new concept in the country, which has contributed immensely in making the project a successful venture. The project has initiated a sort of new cooperative movement among small industries.

The National River Action Plan

Various scientific studies carried out from the early 1950s to 1970s had revealed the declining trend in water quality of the river Ganga. The Ganga Action Plan (GAP) was formulated and launched in 1985 primarily to arrest this degradation by a comprehensive programme of interception and diversion, treatment of domestic sewage and prevention of toxic and industrial chemical wastes from identified grossly polluting industrial units entering into the river. In addition, schemes of low cost sanitation; river front development and electric crematorium were taken up. The evolution of the GAP since its inception has had many interesting lessons to offer both in the matter of river basin management and project implementation. Further the

GAP has also persuaded government to look into the growing problem of pollution and deteriorating water quality in the other rivers of the country. The Ganga Action Plan (GAP) model with necessary corrections on the basis of lessons learnt and experience gained has been applied to all the major rivers of the country under the National River Conservation Plan (NRCP) launched in 1995. The NRCP has been conceived as a larger plan to carry out pollution abatement works in 46 towns located along 18 inter-State rivers in 10 States. About 44 towns would be covered by the National River Action Plan in the first instance for tackling the problem of pollution load in their river stretches. The States covered are Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh. An amount of Rs.9 billion is estimated as the cost of treatment of 1650 million liters of wastewater per day likely to be generated by the 44 towns.

Chapter 2

Poverty and Growth

Over the 20 year period 1973-74 to 1993-94, the poverty ratio (i.e., percentage of poor in the total population) in India has declined from 55% to 36%. However, due to the increase in population, the number of poor in the country remains more or less the same. There were 321 million poor persons in 1973-74 and there were 320 million poor persons even in the year, 1993-94. The number of urban poor has, in fact, increased from 60 million to 76 million over this period. Number of rural poor has declined from 261 million to 244 million.

The World Bank have also come out with a study of Indian poverty (The World Bank, 1997). They have utilised all the NSS Rounds on consumer expenditure available since 1951-52 and have produced a long series of poverty estimates. They have broadly followed the Expert Group method (the same as is followed in the Planning Commission) in the measurement of poverty with a slight further modification in the index for updating the rural poverty line. For the benchmark year for which both the estimates are available, the World Bank estimates of poverty are lower than the Expert Group Estimates on an average by about one percentage point. The World Bank have also worked out the poverty gap index and squared poverty gap index to measure the depth of poverty. It is interesting to note that the different indicators of poverty in India tell almost the same story. When a significant poverty alleviation takes place, it takes place along all the expenditure groups and the poverty depth varies almost in the same proportion as the head count ratio. Our income distribution has not changed significantly. This could be due to peculiar production

and employment structure that we have. Head count ratio, therefore, in our case, is a good robust indicator of poverty.

Poverty in India remained more or less at the same level during the three decades of fifties, sixties and seventies. There were periodical fluctuations. There were years when the head count ratio went up to 62%, and in some years it declined to a little less than 50%. Poverty started declining from early eighties and since then the decline has been persistent.

A number of things happened since the beginning of the decade of eighties. Economic growth rate climbed from an average of 3½ per cent growth, to over 5 percent growth, and the growth rate has even improved since then. After allowing for population growth and growth in saving during the first three decades after independence, private per capita consumption could grow only at the rate of about one per cent per annum. After eighties, private per capita consumption has been growing at the rate of about 3½ per cent per annum, which is a big jump from barely 1 per cent. This obviously had implications for levels of living and poverty.

Agricultural growth also improved significantly after 1980-81. Agricultural GDP growth was 2.58% during the period 1950-51 to 1964-65, and 2.24% during 1964-65 to 1980-81. It improved to 3.29% during the period 1980-81 to 1994-95. The Green Revolution had taken firm roots in North West by the middle of seventies and then it started spreading to other regions. Agricultural growth has direct beneficial impact on poverty alleviation. When agriculture changes from low productivity - low intensity to high productivity - high intensity, it generates lot of

new employment and wages improve. It benefits large number of people, particularly those who are below the poverty line. This is, perhaps the reason why rate of poverty alleviation has been higher in rural areas than in urban areas.

The food situation also improved significantly since the beginning of eighties. The per capita per day food grains availability went up from 442 grams on an average during 1971-80 and even lower levels earlier to 456 grams during 1981-85 and more later. Even the lower availability in the earlier decades was significantly dependent on imports. The proportion of net imports to net availability was 4.68 during 1951-55, going up to 8.83 during 1966-70. The dependence on imports was over during the period 1976-80 and thereafter net import as a component of net availability has been very marginal or negligible. It needs to be further noted that the food basket has also been diversifying over the period and there is much more improved availability of the other items of food. For example, sugar availability increased from 5 kg per capita in 1955-56 to 14.1 kg in 1995-96. Availability of edible oil and vanaspati went up from 3.2 kg per capita in 1955-56 to 8.2 kg in 1995-96. There has been an improved availability of fruits and vegetables and animal products as well. However, food grains still matter the most and particularly for the poor.

Food security as reflected in food grain availability is thus very directly correlated with poverty. This is not to deny the importance of growth in general and employment generation in particular because it is through this process that purchasing power is transferred to the poor. But the absence of adequate food availability causes high food inflation and the available purchasing power becomes inadequate. This may happen even with the existence of large stocks of food grains, as was the

experience in 1992. We were carrying very large buffer stocks and yet during that year food availability became very low because people's real purchasing power was curtailed by very large increases in food grains prices. That was the year when poverty also went up to over 41 per cent. Since the net availability is defined as net of addition to stocks, it more or less reflects the purchasing ability of the people. Thus, food prices become an important component of food security. Income generation to make purchasing power available is yet another important component.

Table. Number and Percentage of Population Below Poverty Line

(Number in million)

	Rural		Urban		Combined	
	Number	Percentage	Number	Percentage	Number	Percentage
1973-74	261.3	56.4	60.0	49.0	321.3	54.9
1977-78	264.3	53.0	64.6	45.2	328.9	51.3
1983	252.0	45.7	70.9	40.8	332.9	44.5
1987-88	231.9	39 1	75.2	38.2	307.1	38 9
1993-94	244 0	37.3	76.3	32.4	320.3	36.3

Source *Planning Commission, Government of India, Press Release dated March 11, 1997*

Chapter 3

Sustainable Agriculture for Poverty Eradication

During the past five decades after independence, Indian agriculture has made significant progress in terms of both output growth and productivity enhancement. A country that was famine stricken prior to independence and an importer of foodgrains till 1960's, has emerged as a net exporter of food grains in recent years. The production of foodgrains increased from 51 million tones in 1950-51 to more than 200 million tones in 1998-99. While the initial stimulus to growth was provided by land reforms, area expansion and systematic development of irrigation, the recent spurt in output growth could be largely attributed to the spread of seed-fertilizer technology in both irrigated and rainfed areas. Besides, the agricultural trade liberalization is said to have induced export-led, albeit diversified agricultural growth, involving the development of horticulture, floriculture and other high value crops in recent years.

However, the benefits of agricultural development remained confined mainly to those regions that had access to assured irrigation and adequate infrastructural facilities. The rainfed areas that constitute nearly 65 percent of the net cultivated area lagged far behind. Although the rainfed areas in the country are highly diverse in their agro-economic characteristics, the yields of crops are generally low and unstable in all types of rainfed situations. Also the economic condition of farmers is relatively worse. Hence arises the need for development of rainfed areas. Besides, there is a growing realization that the yield levels of crops in irrigated areas are plateauing and that some of the rainfed areas in Eastern India have demonstrated tremendous growth potentials in recent years that need to be systematically utilized.

There is no denying the fact that green revolution has centered mainly around the irrigated areas and the yield gaps between irrigated and rainfed areas are quite substantial. But there is evidence to indicate that HYV technologies have been adopted by farmers even in rainfed areas, particularly where there is assured rainfall and occurrence of floods and droughts are minimal. Nevertheless, the yield response to technology adoption in rainfed areas is much less, as compared to that in irrigated areas. Also, the yield variability is relatively higher. In fact, due to low and uncertain yield response to new technology as well as low capital absorption capacity, rainfed areas have lagged behind in terms of both technology adoption and productivity growths. As a result, the rainfed areas are associated with higher incidence of poverty. However, the facts that there is a limit beyond which irrigation potential cannot be increased and that irrigated areas have already reached a plateau in the adoption of available new technology, do compel us to look for alternative sources of agricultural growth, especially in rainfed areas. In fact, the county will have to harness the potentials of rainfed agriculture for ensuring food and nutritional security of its growing population. Although the present food supply situation looks manageable, the growing demand for foodgrains due to both population growth and rising income of the poor would compel us to look for alternative sources and areas of food production.

The current irrigation potential in the country has been estimated at 85 million hectares, of which 76 million hectares have been already utilized by 1993-94 (Planning Commission, 1996). Even after full utilization of the irrigation potential, nearly 45 percent of the net cultivated areas will have to depend on rainfall.

Rainfed areas in the country differ widely in terms of their resource endowments, agro-economic characteristics and potentials for development. In some areas, the amount of rainfall is quite high and follows a stable pattern. However, due to poor drainage system, there occurs either flood or water logging type of situation in the khariff season and the water shortage during the summer. Land shaping, proper dramage and water storage in small tanks as well as development of groundwater resources hold a lot of promise for agricultural development in high rainfall, albeit unirrigated areas. But the areas having scanty and erratic rainfall and low ground water absorption due to heavy run off need to conserve and use water most sparingly and judiciously. In fact, the strategy as well as perspective plan for development of different types of rainfed areas may be different, depending on the location specific needs, resource endowments and potentials of each area. The approach paper to the Ninth Five Year Plan (1997-2002) specifically mentions about the need for such location specific strategy of development in various regions. The Draft Agriculture Policy Resolution of the Govt. of India (1995) also underlines the need for (i) correcting imbalance in growth in eastern, hilly, rainfed and drought prone areas, (ii) meeting challenges of degradation of land and water resources and emerging ecological imbalance, due to increased biotic pressure on land, (iii) encouraging use of marginal lands and augmentation of bio-mass production through agro and farm forestry and (iv) increasing the utilization of irrigation potentials and promoting water conservation and its efficient management.

Although the nature and extent of problems faced by farmers in different rainfed areas vary widely, there are some common constraints to agricultural development in rainfed areas. Aside erratic rainfall, leading to high production risks

due to either drought or flood and low adoption of new technology, there is a serious problem of soil degradation due to erosion by either water or wind, including run off in most areas. It has been estimated that nearly two-thirds of our land resources suffer from degradation, of which about 50 percent have, for all purposes, ceased to be productive. Besides, due to bad slopes, not only the water holding capacity of land diminishes but also it leads to heavy soil erosion in many places. Land suffers from two major ailments, denudation and erosion that results in the loss of top soil through the action of water, wind and waterlogging.

The poor drainage and water management system as well as low utilization of available ground water in high rainfall areas, and low ground water availability as well as high incidence of ground water depletion in low rainfall areas, mainly due to indiscriminate use of scarce water resources, put premium on the adoption of new technology. Besides, the fragmentation of land holdings is another contributory factor to poor land and water management in high rainfall areas, even though it helps in crop diversification and acts as an insurance against risk to failure of any particular crop. At present, the technological options are very limited in rainfed areas. There is either lack of appropriate location specific high yielding technologies or absence of promotional efforts to market indigenous products like ber, khejri, etc., and the associated indigenous knowledge.

It is needless to mention that cropping patterns, crop-rotations and even farming systems differ widely between irrigated and rainfed areas and also between various types of rainfed areas. Given a particular type of agro-climatic condition or resource endowments, certain cropping pattern and farming systems become more

rewarding and sustainable than others. Therefore, what is important is to identify the diversification potentials of each type of rainfed area based on synergistic relationship between seasonal crops, horticulture, animal husbandry, fisheries etc. Unfortunately, public efforts to promote either horizontal or vertical diversification are inadequate partly due to resource crunch and sometimes also because of lack of a clear perspective of development on the part of all concerned. Also market incentives appear to be insufficient to induce private investment for location specific diversified agricultural growth.

The available data further indicate that the incidence of poverty is generally higher in rainfed areas, as compared to that in irrigated areas, which tends to reduce the farmers ability to invest or bear risks, under rainfed situation. Moreover, due to poverty and unfavourable physical condition, the growth of infrastructure facilities of road, market, banks, power and irrigation have been very slow in most of the rainfed areas. In fact, low level of agricultural productivity, poverty and infrastructural underdevelopment have reinforced each other for keeping the rainfed areas under perpetual low level of equilibrium trap. The situation can be improved either through planned efforts of both government and the people or through big push of private investment. Community efforts by involving people through Panchayat, NGOs or self-help groups could be a way of coming out of the low level equilibrium trap.

CHAPTER 4

PROGRESS AND POTENTIALS OF WATERSHED DEVELOPMENT PROGRAMMES

The watershed approach to development is basically the recognition of the inter-relationships between soil and water and between upstream and downstream areas in the development of water harvesting and conservation, appropriate land use, vegetative cover and other potentials of natural endowments in order to promote socio-economic welfare of the people, while at the same time maintaining ecological balance and sustainability.

Several government as well as non-government organisations and external agencies are involved in promoting watershed development projects in various rainfed areas. What follows is a description of the major programmes.

National Watershed Development Project for Rainfed Areas (NWDPRA)

During the Sixth Five Year Plan, the Department of Agriculture and Co-operation launched a pilot project for propagation of water conservation/harvesting in rainfed areas in 19 watersheds located in 15 states. The main objectives were water harvesting and water conservation. Besides, the Ministry of Rural Development selected 23 watersheds in drought prone areas for soil and water conservation. In 1983-84, two World Bank aided projects were started in Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra and Garhwal region of Uttar Pradesh. These projects showed the potentials of vegetative conservation measures to support bio-mass

production. Based on these experiences, the National Watershed Development Project for Rainfed Areas (NWDPRA) was launched during the Seventh Five Year Plan in 99 selected districts of the country, which was intended to develop sustainable bio mass production system and restore ecological balance in rainfed areas. However, the main emphasis was on increasing crop production on arable lands. The project did not provide funds for non-arable land, as it was expected to be met from other sources. But non-availability of funds in time acted as a constraint. During the Eighth Five Year Plan therefore, the scheme was modified to provide a single window financing, for both arable and non-arable lands. The modified scheme provides 100 per cent finance. (75 per cent grant and 25 per cent loan) to states for watershed development. NWDPRA is being implemented in 2479 watersheds, covering 350 districts, spread over 25 States and 2 Union territories. The community development blocks having less than 30 per cent of the available land under assured irrigation qualify for inclusion in the project. The area of a watershed is 500 to 1000 hectares.

The Project is being implemented with greater emphasis on people's participation at both planning and implementation stages. The main objectives of modified NWDPRA are (i) to conserve, upgrade and utilise land, water, plant, animal and human resources in a harmonious and integrated manner, (ii) to generate massive employment during the project period and regular employment after completion of the project, (iii) to improve production environment and restoration of ecological balance through scientific management of land and rainwater, using in-situ moisture conservation, network of low cost, water harvesting structures, natural vegetative conservation measures for run off management and for recharge of ground water

capability and (iv) to develop a sustainable farming as well as livelihood systems based on individual as well as common property resources.

The Eighth Five Year Plan fixed a target of only 28 lakh hectares of area to be covered under NWDPRA. But the actual area being covered is as high as 42.97 lakh hectares. This is because the per hectare requirement of funds under the approved projects is much less than the per hectare cost ceilings fixed. The Ninth Plan further intensifies the programme.

Training of implementing agencies at various levels is an important component of NWDPRA. Upto April, 1995, about 3095 field functionaries, 8341 Mitra Kisan/Gopals, 2714 Mahila Mitra Kisans and 106 NGO's have been provided training. About 1426 composite nurseries, 1343 Kisan/Mahila Mandal nurseries and 199 government owned nurseries have been established to provide seeds, seedlings, flora, forestry, horticulture, grass and legume species at the farmer's doorsteps in watershed areas. In several states, the progress has been slow due to non-availability of lands for the purpose.

Other Soil and Water Conservation Projects

Other soil and water conservation projects of the Union Ministry of Agriculture and Co-operation include (a) Soil Conservation in the catchments of river valley projects (RVP) being implemented since Third Five Year Plan, (b) Integrated watershed management in the catchments of flood prone rivers and (c) watershed development project for control of shifting cultivation in north-eastern regions.

Upto the end of Eighth Plan, about 33.3 lakh hectare of area is likely to be covered under soil conservation in the catchments of RVP, in 29 catchments spread over 18 states. This works out to be about 16 percent of the treatable area.

The Integrated Watershed Management in the catchments of flood prone rivers (FPR) is being implemented in 8 districts, covering 234 watersheds in 10 catchments. This is intended to reduce the peak rate of run off by increasing recharge which helps in reducing floods. Nearly 7.05 lakh hectare is proposed to be treated till the end of eighth plan, which works out to be 11 per cent of the treatable area.

During 1993-94 a new catchment in Thein Dam in Punjab, Jammu & Kashmir and Himachal Pradesh and Ghaggar catchment in Haryana, Himachal Pradesh and Punjab have been included under FPR. Besides, Narmada Sagar in Maharashtra and Koshi catchment in Bihar were approved in 1994-95 for inclusion.

Watershed development project for the control of shifting cultivation in north eastern states was initiated in 1994-95. This is being implemented in 129 watersheds on the line of NWDPRA.

Further, a scheme for the reclamation of alkali soils in the states of Haryana, Punjab, Uttar Prudish, Madhya Pradesh, Gujarat and Rajasthan is also being implemented.

Programmes of theUnion Ministry of Rural Areas and Employment

The Ministry of Rural Areas and Employment has been implementing various area development programmes like Drought Prone Area Programme (DPAP) and Desert Development Programme (DDP) for a very long time. The DPAP was initiated in 1973-74 with a view to promoting integrated development of land, water and other natural resources in drought prone areas. Similarly, DDP is being implemented since 1977-78, the main objectives of which are to control desertification of the desert areas and to conserve, develop and harness land, water and other natural resources for restoration of ecological balance. However, till recently these area specific programmes did not have focus on watershed development, excepting in a few places. The Ministry of Rural Development had set up a Task Force in 1980-81 under the chairmanship of Dr. M.S. Swaminathan which spelt out various elements of drought proofing and ecological restoration, but due to lack of people awareness and participation, these programmes failed to yield desirable results. The L.C.Jain Committee (1990) therefore, rightly pointed out that harmonious management of land, water and vegetation would continue to be the main focus of the programme for which the effective participation of people is important. Following the recommendations of Hanumantha Rao Committee (1994), these programmes have been revamped with effect from 1995-96, the new thrust being area development on watershed basis. The Ministry of Rural Areas and Employment has revised the guidelines from 1.4.95 for utilisation of funds under DPAP, DDP and IWDP (Integrated Waste Land Development Programme being implemented since 1989) and 50 per cent of IJRY and EAS funds for watershed development. Each watershed would be of about 500 hectares and would cover a village as far as possible.

Treatment plan would include all categories of land, private, village commons and degraded forest land. The emphasis is on low cost, simple and easy to operate local technologies.

During 1995-96, National Institute of Agricultural Extension Management (MANAGE) conducted a training programme for collectors, project directors (DRDA) and chief executives and Zila parishad. The MANAGE in collaboration with other national institutes are also conducting a Programme to train the trainers from state level training institutes and agricultural universities. These trainers would then train the field functionaries and the local people, at the state level training institutes, agricultural universities and by NGO's. The villages for launching of watershed projects will be selected by the DRDA/Zila Parishad. Only those villages will be selected where people's participation is assured through contributions to the project in terms of labour, raw materials, cash etc and for operation and maintenance of assets created. There are differential rates of contributions from different categories of people and land. For instance on private lands, it would be 10 per cent of the investment in case of general category people and 5 per cent in case of SC's and ST's and those below poverty line. For development of Common Property Resources, 5 per cent of the required investment would be met through people's contribution. All adult members residing within a watershed area will be members of watershed Association (a registered society), which will nominate 10-12 members on Watershed Committee that will be responsible for spending about 80 per cent of the amount sanctioned for a watershed project. There will be a watershed secretary who will be a full time paid employee of the watershed Association, preferably a graduate from the same village

or a nearby village. He will maintain all records and accounts of the watershed committee.

Programmes Of The Ministry Of Environment And Forests

The Ministry of Environment and Forests is implementing two major schemes, namely (i) Integrated Afforestation and Eco-Development Scheme (IAES) which is intended to promote afforestation and development of degraded forests on watershed basis and (ii) Fuelwood cum Fodder Development Scheme which aims at augmenting production and availability of fuelwood and fodder in 196 selected districts in the country.

Programmes Of The Union Ministry Of Planning And Programme Implementation

The special area development programme, of the Ministry of Planning and Programme Implementation, having focus on watershed development includes mainly the Hill Area Development Programme and the Western Ghats Development Programme The Hill Area Development Programme was started during the Fifth Five Year Plan and aimed primarily at promoting the basic life support systems having focus on sustainable use of natural resources. This is being implemented in designated hill districts of Assam, West Bengal, Uttar Pradesh and Tamil Nadu. During the Seventh and Eighth Five Year Plans, the emphasis shifted from beneficiary orientation to improved management of land and water resources. The Western Ghats Development Programme covering the designated talukas of the western Ghat areas in

Maharashtra, Karnataka, Kerala, Tamil Nadu and Goa, was started in 1974-75 as a part of the Hill Development Programme.

Watershed Development Programmes Of The State Governments

In addition to Centrally Sponsored Schemes', several State governments including Karnataka, Maharashtra, Andhra Pradesh, Orissa, Madhya Pradesh and Rajasthan have shown special interest in soil and water conservation on their own. In Karnataka, two major programmes namely (i) Dry land Development Board Programmes with an outlay of Rs.25 crores in the Eighth Plan and (ii) Soil conservation on watershed basis with an outlay of Rs.1.5 crore for the Eighth Plan are worth mentioning in this respect. In fact, there is a separate budgetary allocation of Rs.300 crore under the special Area Programme of the 8th Plan. Other states do not implement any schemes other than the centrally sponsored schemes, but they have been giving increasingly higher priority to soil and water conservation activities in their respective Plans.

Externally Aided Watershed Development Projects

Several international/external agencies like the World Bank, EEC, KFW, DANIDA, SDC and ODA have been involved in implementing watershed development projects in India with the help of both government and non-government organisations. So far, nearly 16.5 million hectare of area has been covered under various watershed based schemes, of which one million hectare, i.e., about 6 per cent of the total area has been covered through externally aided projects. World Bank

aided project covers an area of 4 lakh hectares at a cost of Rs.360 crore. The EEC aided projects covers 2.42 lakh hectares at a cost of Rs.106.52 crore. The DANIDA aided Projects intends to cover 1.13 lakh hectares at a cost of Rs.45.58 crore. KFW aided Projects cover about 0.64 lakh hectares at a cost of Rs.79.07 crore. The area coverage under SDC and ODA funded project is not available. But the SDC aided project cost Rs.39.75 crore and ODA aided project cost about Rs.6.2 crore. Thus, about Rs.647 crore have been invested in recent years for watershed development by external agencies.

Role Of Non-Government Organisations In Watershed Development

The role of NGO's in watershed development has been recognised by both government and external agencies. The guidelines of the Ministry of Rural Areas and employment clearly specify that non-government organisations/voluntary organisations should be made the Project Implementation Agencies for watershed development, wherever possible. The guidelines of the Ministry of Agriculture provide a special role for voluntary organisations. The Ministry of Environment and Forests also recognises the role of NGO's in regeneration and protection of forests and neighbouring areas. Thus, NGO's are involved in implementing watershed development projects of various government departments and donor agencies. The Koraput comprehensive Watershed Development Project, assisted by DANIDA involves both government and NGO's in implementation. But also there are cases where NGO's have undertaken watershed development programme on their own in micro as well as macro watersheds. In fact, there are some outstanding examples of land and water management on watershed basis by NGO's namely Ralegaon Sidhi and

Adgaon in Maharashtra. Similarly, the contributions of MYRADA, AFPRO, SPWD and AKRSP are quite significant. The Directory of Environmental NGO's in India lists 48 NGO's in Karnataka, 48 in M.P. 98 in Orissa and 93 in Tamil Nadu which are active.

Lessons from Past Experience

The watershed development programmes undertaken thus far, have a mixed story of success and failure. The impact assessment shows a great degree of variation in achievement from project to project, depending on location, level and nature of community participation, caste and class structure, land tenure, nature of technology propagated, institutional arrangements, infrastructure, research, as well as extension and training support etc.

No doubt, the available literature, indicate that several watershed projects have helped improve soil moisture, cropping intensity and crop yields and to some extent employment. It is necessary to point out here that although the short term objectives of different watershed programmes vary widely, the overall long term objective of all such programmes are to improve the livelihood system of rural people in rainfed areas through (i) improvement in environment/ecology by conserving and developing natural resources namely, land, water, perennial vegetation etc. (ii) improvement in production and productivity of crops, animals, trees etc. (iii) improvement in income and employment opportunities for the people, particularly the landless poor and women. However, the success of any watershed development programme in terms of the above parameters would largely depend on (i) cost effectiveness of investment

made, (ii) productivity potentials and sustainability as well as replicability of economic activities undertaken, in view of various technological infrastructural and policy changes and, (iii) institutional arrangements at various levels to enlist peoples' participation including those of the landless poor and women. Although, parameters like (i) improvement in production, productivity, income and employment, (ii) cost-effectiveness, and (iii) sustainability, can be evaluated only after completion of the project, it is possible to plan for them before any watershed project gets actually implemented. Besides, institutional arrangements to enlist people's participation and technological as well as infrastructural support for economic growth would be essential in all stages of project implementation and performance.

A number of research studies have pointed out several deficiencies in our watershed development programmes, in terms of the above mentioned parameters of success. The extracts of some recent case studies would be highly instructive in this regard.

Nagaraja (1996) evaluated the impact of DANIDA funded Karnataka Watershed Development Project (DWDP) which is in operation in 106 villages since January 1991.

Box 1: Impact of DWDP in Karnataka

Case 1: In Shisuvinhal watershed in Hulgur village, the vegetative barriers with *vetiver* grass was established in a big farmer's field. He had lot of outside exposure and showed interest in the programme. But a permanent labourer who was performing field operations in the field where vegetative bunds were made showed slow progress of work due to frequent lifting of the inter-cultivation equipment and excess strain for the labourer and bullocks. The labourer was often scolded for slow progress. This led to removal of *vetiver* grass by the labourer. The experience shows that sense of involvement in the project was lacking on the part of labourers. The project should have provided for additional labour and participation of the labour in the benefits of the project.

Case-II: In Inamhangal in soundathi taluk, ber plantations were established in 7 hectares of land as part of dry land horticulture in the watershed development project. There was luxurious vegetative growth in almost all the plots. But the farmers soon felt that Guava was relatively more Profitable and also berorchara constrained their inter cropping of onion and other vegetables. Therefore, they removed the well established be plants. The implication is that the relative advantage of the introduced technology should be examined properly at the time of the introduction. Farmers may be motivated to adopt any technology because of subsidy, but it is not sustainable.
Case-III: In Hirehulyal watershed in Hanagal Taluk, all the seven villages identified link workers and formed watershed Development Committees as per the guidelines during 1991-93. But due to change of political party in position in 1995, there was demand for change in the link workers and to form new WDC members. The antagonistic village groups interferred in the Proper functioning of the Project. The lesson is that unless there is a cohesive village group, the project may not succeed. The establishment of Panchayat Raj institutions along Political Party line may not necessarily ensure people's participation unless there is arrangement for formation of different WDC for various antagonistic groups and for sharing of benefits.
Case-IV: In Madana halli watershed in Haliyal taluk, a vented dam was built in 1993n across a nala in Pala village. Due to increased availability of water for supplemental irrigation during dry season, four farmers have switched over from paddy cultivation to sugarcane cultivation, which doubled their income levels. ,All the four farmers are sharing available water and maintaining it. They have also purchased diesel pump under joint ownership to irrigate the crop. The implication is that with provisions of proper benefit sharing the watershed structures can be maintained by the people.
Source: N.Nagaraja, 'people's participation in Karnataka Watershed Development Project. In Watershed Development, Edited by Jensen et.al.WDCU Publication, 1, 1996.

The study by Nagaraja shows that outcome of watershed development can vary under the same project in different locations, due to various socio-economic, technological and institutional factors.

The crucial determinants of success include (I) effective participation of the people, including labourers, (ii) selection of appropriate technology and (iii) appropriate institutional, albein conflict free arrangements for cost and benefit sharing.

Deshpande and Ratna Reddy (1991) studied the impact of NWDPRA in Maharashtra in three different agro-climatic situations. The fmdings of the study are summarised in

Box-2. The study by Deshpande and Ratna Reddy clearly shows that selection of appropriate location specific technology is a key determinant of success of any watershed project.

Box 2: Impact of NWDPRA

The study was conducted to evaluate the impact of NWDPRA in Maharashtra, covering one watershed each from three districts of Solapur, Aurangabad and Akola which represented three different agro-climatic zones. Based on farmers perceptions, it was observed that the watershed projects led to higher yield level and stability, increased fodder availability, higher employment and upward shift in wages. But there was variation in the impact due to location specific technology used in different regions. It was also observed that low rainfall areas with high level of soil degradation, will need a longer gestation periods to yield results

Source: R.S.Deshpande and V.Ratna Reddy: Watershed Development Approach in Fragile Resource Region: an Analytical study of Maharashtra, Agro-Economic Research Centre. GIPE, Pune, Dec, 1991.

T.V.S. Rao (1996) evaluated the impact of NWDPRA in two watersheds of Andhra Pradesh namely Naravagedda watershed in Visakhapatnam district and Emboy watershed in Kurnool district. The findings are summarised in Box-3. It is borne out from Rao's study that i) availability and selection of appropriate technology, ii) strengthening the knowledge of Mitra Kishans who are supposed to be the agents of transfer of technology, iii) economic coordination between various line departments such as agriculture, animal husbandry etc. are essential for the success of watershed projects.

Box 3: Highlights of the Study on NWDPRA in Visakhapatnam and Kurnool districts

The main programmes included in both the watersheds (a) vegetative filter strips, (b) Contour vegetative hedges, (c) gully control measures, (d) crop-forestry, (g) production system (h) treatment of drainage lines and (I) livestock management. Upto 1993-94, the achievements fell far short of the plan targets in respect of all these programmes. In both watersheds, beneficiary farmers invested more and received less returns per unit of land in respect of most of the crops, excepting bajra in Naragavedda watershed for which appropriate high yielding variety technology was available. Several shortcomings were observed (I) Many of the Mitra Kisans who are supposed to be the channel for transmission of knowledge do not know their functions properly and are unable to repeat what they were taught at the training seminars (ii)

The Gopalas, who are voluntary agents are unwillingly to forgo their daily wages and guard the fodder and other plots, (iii) Khus grass is unsuitable when there is a dry spell immediately after planting (iv) The participation of the Annual Husbandary Department is inadequate, and also there is no training of mitra Kisans and gopals of self helf groups to conduct castrations, artificial insemination etc.

The lesson is that without proper training, technology, economic incentive and co-operation and commitment of concerned departments, the objectives of watershed development would not be fully achieved.

Source: Report on an Evaluation Study on NWDPRA in Andhra Pradesh, Agro-Economic Research Centre, Andhra University, Visakhapatnam, January, 1996.

Athawale (1995) analysed the impact of watershed projects in Raipur and Khargaon districts of Madhya Pradesh, the findings of which are summarised in Box-4. Athawale's study indicate two major missing links in the watershed projects of Raipur and Khargone in Madhya Pradesh. These are i) lack of adequate emphasis on animal husbandry, agro-forestry and horticulture and ii) absence of proper maintenance and repairs of the structures created with heavy investment.

Box 4: Findings of a survey of silyarina watershed in Raipur and chanderinala watershed in Khargaon (M.P.)

In both the watersheds, the emphasis was more on 'drainage line treatment' and less on livestock management. The drainage line department accounted for nearly 82 per cent the total expenditure in Raipur and 53 per cent in Khargaon, while livestock management shared only 0.2 per cent in Raipur and nothing in Khargaon. However, agricultural land development and production system shared about 29 per cent of the total expenditure in Khargaon. In both the places, the percentage utilisation of total funds during the first four years of the plan period was as low as 39 per cent in Raipur and 22 per cent in Khargaon. In Raipur, there was no significant difference in the cropping patterns of beneficiary and non-beneficiary farmers. But non-beneficiary farmers continued to have greater access to irrigation. The net profit per hectare also was higher on non-beneficiary farms. However, in Khargaon, beneficiary farmers had higher access to irrigation and HYV technology and therefore, the net returns per hectare on beneficiary farms were comparatively higher. Nevertheless, the difference could not be solely attributed to watershed project, as the NWDPRA activities were only marginal or peripheral. There was visible impact of the project in terms of rising water table in wells, check on soil erosion etc. the effects of which may be felt in the long run. However, the agro-forestry and horticulture programme failed mainly due to high mortality owing to lack of proper care. Another shortcoming mentioned was the absence of proper maintenance and repairs of structures created which may ultimately destroy the benefits of investment made thus far.

Source:M.C.Athavale, Agro-Economic Research Centre, Jabalpur

Nayak (1996) analysed the impact of comprehensive watershed Development project in Koraput and Malkangiri districts of Orissa. The summary of findings is presented in Box-5. The study of Nayak shows that the externally aided watershed development projects in Koraput and Malkangiri districts of Orissa suffer mainly from I) lack of adequate awareness among the beneficiaries and ii) lack of effective participation of the people and iii) lack of attitudinal changes of the implementing authorities.

Box 5: Impact of Watershed Development Project in Koraput and Malkangiri Districts of Orissa

The Indo-Danish comprehensive watershed Development project covering 12 watersheds in Malkangiri and Koraput districts of Orissa is in operation since 1993. The major activities include soil and water conservation including tree and grass planting, improved agricultural practices through training, extension and target group participation through, NGO's. Majority of the population who belong to poor landless gfamilies and small and marginal farmers form the main target group.

Large scale plantation target was kept in the first year. But lack of proper awareness among the beneficiaries acted as constraints. Measures like contour trenchings, contour bunding, stone well terraing and percolation ponds could not be done due to shortage of staff However, after one year of execution of catch pits for an area of 245 hectares, the response of plants to this measure was found to be quite significant. There was an increase of plant height by 19 per cent and dry matter by 16.5 per cent where catchpits were given. The technologies used for insitu soil and moisture conservation were of low cost and locally acceptable. But the project required more effective participation of the people through NGO's as well as attitudional changes of the implementing authority to proceed as per the plan.

Source: Trilochan Nayak, In-situ soil and Moisture Conservation works in watersheds: Some reflections on Experience in CWDP in Koraput and Malkangiri District of Orissa in Watershed, Edited by Jensen, et al, WDC , Publication 1, 1996, pp.421-432.

Chopra and Subba Rao (1996) studied the impact of Sahibi watershed Project (FPR) in Sikar, Alwar and Jaipur districts of Rajasthan which is in operations since 1978 and compared the results with those of Ralegaon sidhi in Ahmednagar, Maharashtra. The results are summarised in Box-6. It is clearly borne out from Box-6 that success of watershed projects depends to a great extent on the selection of

location specific technology. Economic effects of Sahibi watershed project in Rajasthan which adopted mainly engineering technology are reported to be more pronounced than those of even Ralegaon Sidhi , although the environmental effects of Ralegaon Sidhi Project were found to be relatively better.

Box 6: Impact of Sahibi Watershed Project in Rajasthan

The Sahibi watershed project has so far cost about Rs.3796.08 lakh, covering an area of 141948 hectares. The average cost per hectare works out to be Rs.2674. The conservation structures include drop and chute spillways and dams, box inlets and outlets, retaining walls, gunny bag structures and afforestation programmes in forest and wastelands were taken up. About 10,000 mango and other plants were planted by farmers themselves in their lands.

The positive, albeit economic effects of sahibi project were found to be more pronounced than those of Ralagaon sidhi. But within Sahibi watershed projects, the engineering technology in Tatarpur sub-watershed and water harvesting technology in puthalopur sub-watershed had distinct locational advantages. From the points of view of environmental effects however, the Ralegaon Sidhi's performance was found to be much better than Tatarpur and Pithalpur sub-watersheds. The Development Programmes were relatively more people centred in Ralegaon Sidhi.

Source: Kanchan Chopra and D.V.Subba Rao (1996)' Agricultural policy perspective under the Ninth Plan, Dry land Farming with special Reference ton watershed management, IEG, Delhi, September, 1996.

Box 7: Success Story of People's Participation in Mendhwan

The Mendhwan Project is a part of the Indo-German Watershed Programme started by NABARD with financial support from a German development bank, Kreditanslalt fur Wiederaufbau (KfW) and active involvement of the Government of Maharashtra Mendhwan had an area of 1355 hectare which has barren and degraded. There was acute shortage of water. The Social Centre, a voluntary organisation initially arranged a visit of the people of this village to Adgaon, a successful watershed Project in Aurangabad district. This impressed atleast one farmer to get his land treated. Due to good rainfall, the impact of treatment on the well and groundwater recharge around the well was remarkable. This motivated other 40 farmers to come forward. A watershed committee was formed which was represented by people from different parts of the village, including women, marginal farmers and the landless. A typical watershed development approach was followed from the ridge to the valley. As a result of the watershed development programme, the Mendhwan overcame the water scarcity situation. Water levels in village wells increased. Agricultural Production almost doubled in two years period and there was a significant rise in milch animals. The lesson is that once people are convinced and properly organised. Watershed Development Programme has a tremendous impact on overall rural development.

Source: Vinu Wadagaonkar, 1997.

Box 8: KASARE – A Sage of People's Faith

Following the drought of 1987-88, the Social Centre a voluntary organisation organised the people KASARE of KASARE village for watershed development. An awareness Programme was launched for conservation of water. There was a ridge to valley perspective and emphasis on soil conservation and bio-mass regeneration. This weas followed by improved agricultural practices, horticulture development, animal husbandry, fishery, drinking water, and health schemes. The programme is a successful one.

Source: Social Centre, Ahmed Nagar, Maharashtra.

Katar Singh (1991) analysed the success stories of PIDOW, Gulbarga (Karnataka), Ralegaon sidhi in Ahmed Nagar district of poone and Sukhomajri in Ambala district of Haryana. The results are presented in Box-9.

Box 9: Factors Behind success stories of PIDOW, Ralegaon Sidhi and Sukhomajri

i) The Mysore Resettlement and Development Agency (MYRADA) a non-government organisation in collaboration with Karnataka Govemment and Swiss Development Corporation launched a Project, called participative and Integrated Development of watersheds (PIDOW) in Gulbarga district in 1986. It covered an area of 148 hectares The project staff organised the people into small homogeneous groups/associations and all the project activities were planned, excuted, monitored and followed up by these associations. Every member of the associations voluntarily saves money every month which are saved in common fund of the association, out of which loans are granted to the needy members. The conservation structures taken up in the project are repaired and maintained by the people themselves.

ii) The Ralegaon sidhi Project covered four watersheds and a total geographical area of about 892 hectares. The total expenditure incurred on the Project was Rs.112.75 lakh of which Rs.52.75 lakhs was granted by Maharashtra Government, Rs.47 lakh was borrowed from banks, Rs.11 lakhs contributed by villagers through shramdan and the remaining Rs.2 lakhs was raised from other sources. A series of checkdam and bunds constructed under the Project resulted in increased ground water availability. Farmers now grow two to three crops every year including fruits and vegetables. All the soil and water conservation structures were built through community action. The villagers have completely stopped grazing their animals on common lands and switched to stall feeding. For equitable distribution of water, pani puravatha Mandals (water supply Association have been established. The success story owes much to leadership of Sri Anna Hazare who transformed Ralegaon Sidhias a self-sufficient, Promising village from a poverty striken village earlier.

iii) The sukhomajri Project was launched as a model project in 1979. The main focus was on harvesting and recycling of rain water. A total area of 4085 ha.was treated at a total cost of Rs.78.32 lakh. The project was implemented jointly by Haryana State Government, ICAR and the Ford Foundation. A water users society was set up in 1982 to ensure equal distribution of irrigation water and forest produce among the villagers and thereby to enlist their participation in the project. The landless also had a right to water. The Sukhomajri experience shows that People's participation and co-operation would be forthcoming only when they have a stake in the benefits from the project. Due to increased productivity of crops and milk yields on account of the supplemental irrigation and assurance of equal share of every village household in the reserve water, the people participated in the programme whole heartedly.

Source: Katar Singh (1991): Determinants of People's participation in Watershed Development and Management. Indian Journal of Agricultural Economics, Vol.XLVI. No.3. 1991. pp 278-280.

The study by Katar Singh shows that effective participation of the people through i) formation of self-help groups ii) formation of pani panchayat and iii) equitable sharing of cost and benefits is crucial for the success of watershed development projects. The study reveals:

a) The most important prerequisites for peoples' participation is that the expected private benefits from participation should substantially exceed the expected costs.

b) Non-government organisations are better oriented to enlist peoples participation than bureaucratics and have necessary skills and patience to work with them.

c) In all the three above mentioned projects, the quality of local leadership was good.

d) The role of government should be limited to providing financial and technical guidance, basic infrastructure and enabling proper legal and political environment for people's participation.

Formal system of sharing the project benefits among the local people must be ensured and enforced by the people themselves.

Chapter 5

Role of People's Participation in Watershed Development

In a decentralized democratic pattern of development, people are both a target and a tool of development. The ultimate objective of any development programme is to increase the welfare of people. Therefore, people are the target. Also unless the people themselves are involved in the planning, execution, monitoring and maintenance of a development project from which they expect to benefit, there is little chance of the project concerned of becoming successful or sustainable. It is for this reason that people's participation or partnership in development is considered essential. The participatory approach is a relatively new, but well tested approach to development. The experience of some successful watershed projects in India and abroad tell us the same story.

By design, the participatory approach to watershed development would involve all individuals in any watershed area in the process of planning of watershed project and secure their commitment to execute, monitor and maintain the project even after completion. There may be conflicting interests of various social and economic groups. But the conflicts are resolved through participatory, albeit joint decision making process. Any idea may be challenged during the decision making. But once a decision is taking by the group, it becomes binding on all members. Also when individuals seek to co-operate, conflicts tend to get resolved. This is the essence of success of any participatory approach to development.

However, there could be different approaches to participatory watershed development. It could be a government programme with People's Participation or People's Programme with government and/or other agencies participating in it. In the latter case, government and non-government organizations play only the role of catalysts. But even in the first category of projects, success depends on effective involvement of the people at each stage of the project cycle, from project preparation through implementation and evaluation.

The Past Experiences in Participatory Watershed Development

As Hanumantha Rao Committee points out, "barring a few exceptions, there have been no systematic efforts made at involving people of the areas concerned in preparing and implementing DPAP and DDP. The programmes were conceived, evolved and implemented through bureaucratic mechanisms"

However, following the recommendation of Hanumantha Rao Committee, the Ministry of Rural Areas and Employment (1994) have provided a new guideline for implementation of these programmes which emphasizes involvement of voluntary organizations and effective participation of the local people. According to the new guideline, only such villages will be selected by DRDA/Zilla parishad for watershed development, where people's participation is assured through voluntary donations and contributions to the project in terms of labour, raw materials, cash etc. for developmental activities and for operation and maintenance of assets created. People's contribution would be 5 percent of the required investment for development of common property resources and 10 percent of investment for development of individual private lands in case of general category of people and 5 percent in case of

Scheduled Castes, Scheduled Tribes and others below poverty line. At the village level, there is provision for the establishment of watershed association, comprising of all adult members residing within the watershed area. In case, a project area covers only one village, gram sabha will be designated as watershed association. There will also be a watershed committee of 10 to 12 members representing various sections of the society and nominated by the watershed association. The watershed committee will be primarily responsible for execution of any watershed project. Besides, there will be a full time watershed secretary, preferably a graduate from the same village or nearby village who will be assisted by local volunteers to implement watershed development project at the village level.

Similarly, the relevant guideline for NWDPRA says that ultimately it should become a people's programme and government would participate in it to provide necessary support. There is provision of a Friendly Farmers Forum, known as Mitra Krishak Mandal. From each village of a watershed, five friendly farmers are selected by consensus in a general assembly of the village. It would generally comprise of 2 women, 1 landless person, 1 artisan and 1 enlightened farmer. The Forum then selects a president and a secretary by consensus. The main responsibilities of the Forum include (i) organization of training courses for farmers, livestock rearers and artisans from time to time, (ii) resolving the conflicts, (iii) Review of the progress in implementation of watershed development programmes periodically and advice for mid-way correction, if needed, and (iv) assistance and guidance in the formation of self-help thrift groups to accelerate the pace of implementation of different programmes. In fact, self-help groups are constituted activity wise with a view to developing and managing both common property resources and household production

systems. Self-help groups generate thrift and deposit savings in the banks and the banks in turn extend loans to such self-help groups to the tune of 4 times the savings deposited by them in the bank. The NGO's wherever available, are involved in organizing such self-help groups. The Mitra Krishak Mandal provides necessary assistance also for organizing the exclusive self-help groups of women and arrange training programmes for them to take up various activities in household production systems, such as sericulture, bee keeping, mushroom cultivation etc.

Role of Panchayat

In the emerging scenario, the Panchayat Raj institution would have an important role to play in watershed development. The Zilla Parishad would receive funds, appoint the project implementation agency and approve the work plans. At the block level, there is a provision for a committee under the Chairmanship of Block Pramukh of which all village Pradhans (heads) are members. The committee meets once in a year to review the progress of implementation. It is also expected that monitoring and supervision of the project implementation at the micro watershed level, would be undertaken by Panchayats, although no specific role has been assigned to the Panchayats for implementation of the project even after 73rd amendment of the constitution which assigns some development roles to Panchayats. However, unless there is an effective devolution of responsibilities, finances and administrative powers, the Panchayats would remain largely inactive in this regard. As per the existing provision, the Mitra Krishak Mandals and Self-help groups of beneficiaries will maintain the assets and infrastructures created in watersheds. Nevertheless, it is expected that Panchayat would come forward to maintain the structures created in a watershed and would also help in the promotion of required

development activities in a watershed area. But the Panchayat Acts being enforced in several states should specifically provide for this.

In reality however, people's involvement in the watershed development programme either through Panchayats or Self-help groups appears to be weak at present. The ceremonial presence of Panchayat heads have failed to generate sufficient interest among the people for their effective participation in watershed development project. In fact, the whole process of people's participation in watershed development requires lot of training and skill formation on the part of staff, Panchayat members and the local people, which are high inadequate at present. Besides, there is need for sensitization and motivation for people's involvement in watershed development.

Question of Equity

It has been generally observed that most of the watershed development projects in the country do not provide for equitable sharing of costs and benefits by the people. Although landless labourers are generally mentioned as a special target group, both the design and the actual implementation do not target any activities to improve their livelihood system. What they do get from the project is wage labour for a short duration. Similarly, large farmers shared higher benefits than the marginal farmers. This raises the question of land reforms particularly the usufructuary right on trees and use of common lands. Besides, there should be efforts to help the assetless to acquire skills for enhancing their income through convergence and effectiveness of various development schemes.

The dominance of a particular caste or class of people in a Panchayat also acts as a constraint. It may be possible to take all people along, provided there is unbiased social commitment, training and development orientation of Panchayat functionaries, Education and training may make a sea change. The 73rd amendment to the constitution also provides for reservation of seats for women and the socially deprived sections which may help ensure equity in the implementation of development programme at the village level. It has been further observed that even Mitra Kisans and Gopals do not show much interest in either training or guarding the watershed structures, presumably due to lack of adequate economic incentive. Therefore, there should be an in built mechanism to motivate them for such responsibilities.

Role of NGO's

In recent years, there has been a clear government policy to involve non-government organizations in watershed development. Their role is to organize training for self-help groups and also to create awareness among the people for watershed management for sustainable development. NGO's are generally more effective in enlisting people's participation in watershed development. However, as the Hanumantha Rao Committee pointed out, "even where voluntary organizations have been involved, really genuine ones among them did not get the encouragement and opportunity they deserve. As it would take some time for the democratically selected local self-government institutions to take roots and the voluntary organization of people to come up in many parts of the country, it may not be possible to effect the transfer of the DPAP and the DDP at this stage to them. It would be desirable to move towards the goal of entrusting ultimately 25 percent of watershed to the voluntary organizations for implementation. For effective mobilization of local

people's participation. the voluntary organizations shall constitute watershed development teams for the implementation of the programme and shall share the accounts for the grants given for watershed development with the General Body of watershed team".

According to the committee, wherever reputed voluntary organizations are forth-coming implementation of 25 percent of the DPAP/DDP watershed in district may be entrusted to them. In fact, a number of committed voluntary organizations have successfully implemented watershed development projects in various parts of the country. namely. Adgaon, Ralegaon Sidhi, Kasare, Mendhwan, NUPADA at Gulbarga Sukhomajri and so on.

The Ralegaon Sidhi experience is often cited as an example of successful watershed development project which was implemented by NGO. But as Anna Hazare. the man behind the success, points out, the process is not easy, as it demands a commitment from all those who are affected by it. Watershed development would not have been effective if the social fabric had remained unchanged. Sparring factions and socially created barriers usually make it difficult to implement development projects. Similarly, problems like alcoholism and other vices can disrupt the development process. Therefore, the five principles of nasbandi (restriction on family size), nasabandi (ban on alcohol), charabandi (ban on grazing), kulharbandi (ban on tree felling) and shramdan (donation of voluntary labour) were followed by Anna for sustainable development of Ralegaon Sidhi. Because the people were convinced about the expected gains, he could motivate all sections of the population to participate in the programme. The Govt. of Maharashtra is trying to

replicate Ralegaon Sidhi Model of watershed development in about 300 villages based on the concept that development cannot take place without the participation of the people in all stages of the programme. The decision to implement the project in the village has to come from the villagers themselves and all aspects of implementation have to be planned by them. In Ralegaon Sidhi, all decision relating to watershed project and other welfare activities are taken in the Gram Sabha by a simple majority along non-political line. In case of difference of opinion, the majority opinion becomes acceptable. Therefore, in the proposed ideal village development scheme in the state also, a similar line of approach to participatory development has been envisaged. In fact, planning of activities, maintaining accounts, creating awareness in the villages about their social responsibilities, organizing shramdan and gram sabha meetings will be the function of voluntary organisation. But it is Gram Sabha which identifies a committed voluntary organization for the purpose.

Prerequisites for People's Effective Participation

The story of Ralegaon Sidhi and other successful projects do tell us that effective participation of people in watershed project becomes a reality only when the expected private benefits from participation are greater than the expected costs of participation. There should be a formal system of sharing of costs and benefits among the local people which should be as equitable as possible and must be ensured and enforced by the people themselves. Besides, there should be a committed local leadership who enjoys the confidence of all sections of the people. Moreover, it should be a people's programme and the role of government should be limited to providing technical guidance, basic infrastructure and limited financial assistance if

necessary. The government should also create a proper legal and political environment for people's effective participation.

No doubt, NGO's are better endowed to enlist people's participation. But the experience by Sukhomajri in Haryana and PIDOW in Gulbarga in Karnataka demonstrate that even committed government organizations can deliver. What is important is to create an appropriate institutional set up at the local level by which people collectively develop a sense of ownership of the project. In the case of Sukhomajri, a watershed society was set up to ensure equal distribution of water and forest produce among the villagers. Even the landless had a right to water Similarly, at the PIDOW in Karnataka, MYRADA, a Voluntary Organisation implemented the project in close collaboration with Karnataka Government and Swiss Development Corporation The project staff organized the people into small homogenous group associations and all the project activities were planned, executed, monitored and followed up by these associations. There is a common fund of the association which has been developed out of voluntary savings of the members which is used to meet their capital requirements. The conservation structures are repaired and maintained by the people themselves. Conversely, as mentioned by Sawhney et al (1996) in many other projects, participation of beneficiaries is enlisted only at the implementation stage. The project staff take to the beneficiaries pre-decided activities and do not consider their involvement in problem analysis, needs assessment, early project planning stages and maintenance of the project after completion.

Further, the Koraput CWDP experience shows that although the watershed committees were given the responsibility of motivating people to contribute to project

activities in the implementation plan, in actual implementation, there is no contribution for work either on common lands or on private land. Even in the case of KWDP in Karnataka, a flat rate of minimum 10 percent worth contribution was obtained from the beneficiaries, irrespective of category and affordability of the beneficiaries (Nagaraj, 1996). In fact, beneficiary contribution to project activities according to one's ability is necessary both to ensure participation and to promote sustainability.

Active involvement of women in watershed development programme is equally important. Women, specially belonging to landless families are directly dependent on natural resources like fire wood, fodder, fibre etc. for livelihood. Therefore, these women should be encouraged to manage village commons in a group which will lead to regeneration of land and other natural resources. However, this may require amendment of Panchayat and village Common Land Acts and there should be gender sensitization of all those involved in the implementation of watershed development programme.

James Mascarenhas points out that there are several states in the implementation of participatory watershed development projects. In stage 1, there should be preliminary PRS's to understand more about the local community, identification of community action programmes, group formation and development through savings and credit management and watershed awareness. In Stage-II there is need for demarcation of watershed, identification of stake holders, participatory study of watershed resources, participatory planning exercise and activity planning involving both land based and non-land based livelihood systems. In fact, non-land

based activities may be more relevant to enthuse the landless poor to get involved in the project. Stage III involves the implementation process which include (i) strengthening of community organization within the watershed, (ii) implementation of watershed management activities on private lands, (iii) development and management of CPR's, (iv) development of non-farm income generating activities for landless poor and the women and (v) monitoring. In stage IV, it would be necessary to prepare the beneficiary groups to become self-reliant so that people manage the project on their own. Both Government and NGO's should withdrawn from direct interaction with the group.

To conclude, participatory watershed development envisages that any given community in a watershed area would manage all its assets, natural and human resources for increasing the wealth and welfare of its members on sustainable basis. There could be alternative approaches to such development programme. But in all cases, people must be the target as well as the means of development. Also the roles of Panchayat, NGO's and the Government, would differ in different places, depending on the location specific needs, objective conditions, education and awareness of the people about the need for participatory development.
