6.2 IRRIGATION, FLOOD CONTROL AND COMMAND AREA DEVELOPMENT

The Ninth Plan target is to achieve a growth rate of 4.5 per cent per annum in agricultural output in order to make a significant impact on overall growth and poverty alleviation. With the net sown area almost stagnant in the country at 140-141 m.ha., further expansion of irrigation, including additional irrigation becoming available from modernisation/renovation of irrigation capacities, is needed as a critical input in achieving the targeted growth rate of agriculture in the Ninth Plan. In the post-independence era, the Government recognised the importance of irrigation in increasing the agricultural production and accordingly assigned a high priority to it in successive Five-Year Plans.

2. The strategy for irrigation development in the Ninth Plan has inter alia laid emphasis on rational pricing of irrigation water, promotion of participatory irrigation management, encouraging conjunctive use of ground and surface waters, improving water use efficiency and completion of ongoing projects particularly those which were started during pre-Fifth and Fifth Plan period. The Annexures 6.2.1 to 6.2.4 give the Plan outlays of the Ninth Plan period for Irrigation, Command Area Development and Flood Control.

MAJOR & MEDIUM IRRIGATION

3. The ultimate irrigation potential through major & medium irrigation projects has been assessed at 58.46 M Ha. The potential created at the end of Eighth Plan was 32.95 M. Ha. It is targetted to create an additional irrigation potential of 9.81 M Ha. through major & medium irrigation during Ninth Plan. The year-wise potential created and potential utilised during the Ninth Plan period is given in Annexure 6.2.5.

4. The following Table 6.2.1 indicates the outlay and expenditure for major and medium irrigation projects during the Ninth Plan.

TABLE 6.2.1
Plan Outlays and Expenditure

(Rs. crore)

Period	Central Sector		State Sector	
	Approved Outlay	Actual/Anticipated Expenditure	Approved Outlay	Actual/Anticipated Expenditure
Ninth Plan	330.12	--	42638.37	--
1997-98	42.90	35.95	8362.31	8094.88
1998-99	48.85	47.72	10024.03	9275.75
1999-2000	54.40	51.53	12228.81	11002.42
2000-2001	51.73	--	NA	

PROGRAMME FOR 2000-2001

5. The Ninth Plan strategy for irrigation development inter alia provides for completion of all the ongoing projects, particularly those which were started during pre-Fifth and Fifth Plan period as a time bound programme to yield the benefits from the investments already made, to improve water use efficiency, to bridge the gap between potential created

and its utilisation, to restore and modernise old irrigation system, to introduce rational pricing of irrigation water, to promote PIM, to encourage and implement conjunctive use of ground and surface waters etc.

6. The Planning Commission has identified 43 nos. of major irrigation projects which are continuing from pre-Fifth Plan period. An exercise has been taken up in the Planning Commission for their time bound completion. As per the information received from the states, out of these 43 ongoing projects 11 are reported to have been completed by March' 2000. State Governments have indicated that 19 projects would be completed within the Ninth Plan period, but the remaining 13 projects may spill over to Tenth Plan. It has been therefore decided that a more intensive monitoring of all these projects be done to ensure early completion.

Accelerated Irrigation Benefit Programme (AIBP)

7. AIBP was launched by the Government of India in 1996-97 for expeditious completion of approved ongoing major/medium irrigation projects. Central loan assistance under the programme is in the form of loan at the rate of interest prescribed by the Ministry of finance from time to time and is provided to those projects which have investment clearance of the Planning Commission. Projects which are already receiving assistance from domestic agencies i.e. NABARD are not eligible. However, components of such projects which are not covered under such assistance are considered for inclusion under the programme. Minor irrigation schemes are not eligible for assistance under AIBP. However, from 1999-2000 Minor Surface Irrigation Schemes both new as well as ongoing, of North Eastern States, Hilly States (Himachal Pradesh, Sikkim and J&K) and KBK districts of Orissa which are approved by State (TAC) are now eligible under the programme. Further, as per the revised guidelines CLA is provided to the non special category States in the ratio of 2:1 (Centre:State). For the special category States the funding is in the ratio of 3:1. The projects benefiting KBK districts of Orissa are treated at par with special category States as far as funding pattern is concerned. During 1996-97, a sum of Rs.500 crore was released to 52 projects in various States. During the Annual Plans 1997-98, 1998-99 and 1999-2000 the total releases were Rs.952.19 crore, Rs.1119.18 crore and Rs.1460.58 crore respectively under AIBP. During 2000-01, a budget provision of Rs.1800 crore exists under AIBP. Table indicating CLA released under AIBP appears at Annexure 6.2.6.

MINOR IRRIGATION

8. All groundwater and surface water schemes having culturable command area upto 2000 ha individually are classified as minor irrigation schemes. Minor surface water flow irrigation projects comprising storage, diversion works and surface lift irrigation schemes occupy a prominent place in the scheme of irrigated agriculture particularly in the undulating areas south of the Vindhyas and the hilly regions. Minor Irrigation Schemes are labour intensive, provide employment to rural population and check their migration to urban areas. They also help in raising the standards of living of rural population and bring them above the poverty line. Such schemes are quick maturing and the benefit from the schemes starts flowing with a very small gestation period. Generally, the schemes are installed in a maximum of two to three years.

9. The ultimate irrigation potential from minor irrigation schemes has been assessed as 81.43 m. ha. comprising 17.38 m. ha from surface water schemes and 64.05 m. ha from

ground water schemes. The total potential created at the end of Eighth Plan is estimated at 53.30 m. ha. Hence, the balance potential available at the beginning of Ninth Plan works out to 28.13 m. ha. The target of potential creation in minor irrigation for the Ninth Plan has been fixed at 7.24 m. ha.

PLAN OUTLAYS AND EXPENDITURE

10. The minor irrigation schemes are funded from plan funds, institutional finance and private investments by the farmers. It is generally considered as a people's programme as the plan funds form only a small portion of the total investment for its development. The following table indicates the Plan outlays and expenditure in the Central and State Sectors for minor irrigation schemes during the Ninth Plan.

TABLE 6.2.2
Plan Outlays And Expenditure

(Rs. crore)

Year	Central Sector		State Sector	
	Approved Outlay	Actual/Anticipated Expenditure	Approved Outlay	Actual/Anticipated Expenditure
Ninth Plan	385.00		8984.84	
1997-98	70.56	42.85	1799.20	1536.11
1998-99	67.40	48.09	2057.20	1746.81
1999-2000	55.41	70.71	2217.70	1769.80
2000-01	85.27	-	NA	-

11. Ground water development forms the major part of the minor irrigation programme and includes construction of dugwells, dug-cum-bore wells, filter points, private shallow tubewells and deep public tubewells. It is essentially a people's programme implemented primarily through individual and cooperative efforts with finances obtained mainly from institutional sources. However, due care as well as control need to be exercised against overdrawal of ground water, as is now found in some parts of Punjab, Haryana, Maharashtra and North Gujarat.

12. For the purpose of regulation and control of Ground Water Development and Management Central Ground Water Authority was constituted by the Government under the direction of the Supreme Court. The authority was earlier constituted for a period of one year which was later extended for five years on 13th January, 1998 for the purposes of regulation and control of ground water development and management. The initial approach of the Authority was to put a major thrust on educating the people on conservation and proper utilisation of water. Involvement of masses through community participation in the regulation of ground water usage and its augmentation through artificial recharge need to be encouraged. Mass awareness programmes are to be launched on a large scale for achieving this goal. However, in areas where the situation is fast deteriorating, further stringent measures are to be adopted to check the further depletion/pollution of the resource. This may include declaration of 'Notified Areas', prohibition on extraction of ground water for commercial purposes etc. Central Ground Water Authority is declaring the areas of steady depletion of ground water and areas suffering from ground water contamination as 'Notified Area' for the purpose of restricted usage of ground water.

13. Central Ground Water Authority is registering persons/agencies engaged in the construction of wells. More than 900 drilling agencies have been registered so far on an All India basis. The Authority has tested water samples at different locations through its mobile chemical laboratory to re-evaluate the quality of ground water and to identify toxic elements. To educate the general public about the ground water resources situation the Authority organised mass awareness programmes.

14. Ground water management needs and options vary between areas and change over time. Artificial recharge of aquifer systems is gaining importance as one of the strategies of water management in the context of ever growing demands of water resources CGWB has taken up artificial recharge studies under the Central Sector Scheme in the dark and over exploited blocks. Rain water harvesting and similar recharging techniques should be popularised and implemented with participation of NGOs and Water User Associations.

INSTITUTIONAL INVESTMENT FOR MINOR IRRIGATION

15. Institutional finance plays an important role in the implementation of Minor Irrigation schemes. The Land Development Banks, State Cooperative Banks, Commercial Banks and NABARD provide credit facilities to the farmer and institutions for development of Minor Irrigation facilities. Institutional finance by NABARD for minor irrigation schemes has been decreasing over the last 3 years. The total credit refinanced by NABARD for minor irrigation has decreased from Rs.795.32 crore in 1995-96 to Rs.477.91 crore in 1997-98. In addition, the institutional investment being provided under the normal programme by the Land Development banks/cooperative banks has decreased from Rs.37.29 crore in 1995-96 to Rs.10.72 crore during the year 1997-98. In order to find out the reasons for decline in credit disbursement, a meeting was held on 12th July, 1999 in the Ministry of Water Resources. During the meeting it was pointed out by several cooperative banks that the meetings of the Unit Cost Committee set up by NABARD are not held on regular basis. Since the unit cost has not been revised, the lending for minor irrigation sector has reduced. It was also pointed out that in many cases the ground water availability report, as given by State Ground Water Board, is not updated but in several cases found to be inaccurate. It was decided that as the Central Ground Water Board is operating more that 13000 observation wells in the country and the Board regularly conducta studies regarding water availability as well as its behaviour in different parts of the country. The same may be used for the purpose of providing financial assistance for the minor irrigation sector. It was also noted that late approvals by NABARD contribute towards delaying grants of credit for minor irrigation sector. There was a general consensus that the eligibility conditions for institutional finance for minor irrigation should be less restricted. There has been a decline in institutional finance due to persisting default by some States as the recovery level, is very low in these States. The Ministry of Water Resources is taking steps to remove the above problems and ensuring that the credit disbursement provided by NABARD and State cooperative banks for minor irrigation sector does not decline.

16. The salient features of Minor Irrigation Programme are:

- To ensure adequate provision of funds for the externally aided projects according to the schedule of disbursement;
- To ensure prioritisation for on-going schemes;
- Stepping up the institutional investment to the extent possible including subsidy to small & marginal farmers and other weaker sections;

- Stepping up ground water development, especially in the Eastern and North-Eastern States;
- Encouraging minor irrigation programme for tribal, backward, drought-prone areas and areas having pre-dominantly scheduled caste and scheduled tribe farmers by establishing effective coordination as well as by dovetailing if possible all ongoing programmes/schemes like employment generation schemes etc. under various Ministries.
- Encouraging schemes utilising non-conventional sources of energy like hydrums etc.,
- In water scarce and drought prone areas, the use of sprinkler/drip irrigation system as a water saving device as well as for efficient use of water for productivity should be encouraged.
- To improve the utilisation of public tubewells and their rehabilitation along with turning over to beneficiary farmers for O&M.

RURAL INFRASTRUCTURE DEVELOPMENT FUND

17. The setting up of RIDF in NABARD was announced in 1995-96 with a corpus of Rs.2000 crore and the contributions had to be made by Scheduled Commercial Banks excluding foreign banks operating in India, to the extent of shortfall in agricultural lending in the priority sector targets, subject to a maximum of 1.5 per cent of net bank credit. Presently under RIDF, loan assistance is provided for the purposes of major, medium & minor irrigation, soil conservation, watershed management, rural roads and bridges, integrated cold storage chain projects, integrated market yard projects and other rural infrastructure. The assistance is currently provided upto 90 per cent of the updated cost of the scheme or the balance cost whichever is less and is repayable in 7 years along with interest at the rate of 12 per cent or so per annum. Annexure 6.2.7 shows the details of sanctions and disbursements under different tranches of RIDF.

18. It was observed that the flow of credit from NABARD in respect of certain States was not taking place in the manner as envisaged. A meeting was held under the chairmanship of Deputy Chairman, Planning Commission to review the RIDF Program. In this meeting, the following decisions were taken to improve the funding:

- The environment mitigation costs should be included in the projects.
- The drawal claims can be submitted by the State Government even on a fortnightly basis as against the present practice of quarterly basis.
- States must keep a shelf of projects ready for each sanctioned scheme these must also be prioritised. Whenever money is available on a new tranche is announced, projects can be sanctioned immediately.
- The State Governments should take proper care of maintenance aspects as the general experience is that this is not given due consideration.

COMMAND AREA DEVELOPMENT

19. The Command Area Development (CAD) programme was initiated in 1974-75 with a view to bridge the gap between the potential created and its utilisation and optimising agricultural productivity through better management of land and water use in the command areas served by selected major and medium irrigation projects. The programme presently covers 226 projects with a total culturable command area of 21.95 million hectares spread over 23 States and 2 Union Territories and administered through 55 CAD authorities. From the inception of the programme in 1974-75, upto March, 1998 an amount of Rs.1807 crore has been released to the States as Central assistance under the CAD programme. On the basis of shortcomings, as found during the implementation of this programme over last two decades, it is being reoriented, based on Evaluation Studies, so as to make it more effective instrument for ensuring speedy transit to irrigated agriculture alongwith optimising the water use efficiency.

Plan Outlays And Expenditure

20. The Table 6.2.3 given below indicates the Plan outlays and expenditure in the Central and State Sectors for Command Area Development Programme during the Ninth Plan.

TABLE 6.2.3
Plan Outlays And Expenditure

(Rs. crore)

Year	Central Sector		State Sector	
	Approved Outlay	Actual/Anticipated Expenditure	Approved Outlay	Actual/Anticipated Expenditure
Ninth Plan	860.00		2027.19	
1997-98	141.00	129.96	371.35	360.19
1998-99	188.00	175.32	348.48	303.60
1999-2000	177.00	160.07	315.31	312.13
2000-01	160.88	--	NA	

21. The physical position of this programme is given in the following Table 6.2.4:

TABLE 6.2.4
Achievement On CAD Activities (Mill. Ha.)

Items	Achiv. Till March 1992	Achiv. 1992-93 to 1996-97	Achiv. 1997-98	Antcpt. Achiv. 1998-99	Target 1999-2000	Antcd. Achiv 1999-2000	Cummu-lative achiv. Upto March 2000
Field Channels	12.19	1.76	0.32	0.32	0.32	0.15	14.74
Warabandi	6.12	2.52	0.42	0.33	0.29	0.11	9.50
Land Levelling	1.99	0.10	0.01	0.02	0.03	0.02	2.14
Field Drains	0.58	0.19	0.03	0.06	0.09	0.02	0.88

22. Greater stress is being laid on better and efficient management of the water distribution system, more efficient and timely onfarm water delivery, training of field staff and farmers and involvement of farmers under the command area in the management of water distribution system below the outlet level. Reclamation of waterlogged areas is another item now included under the programme

Programme for 2000-01

23. The programme will be continued during 2000-01. Greater thrust needs to be given for Land Consolidation as a pre-requisite for optimal water use efficiency. Close monitoring and evaluation of the projects is being emphasised both at the Centre and State level by suitably strengthening the concerned organisations wherever necessary. An amount of Rs.160.88 crore has been provided in the Central Sector for Annual Plan 2000-01.

24. In order to assess the implementation and impact of ongoing centrally sponsored Command Area Development Programme in terms of the objectives and its quantification, the Planning Commission has emphasised the need for comprehensive evaluation of the CAD programme. Accordingly, evaluation of 18 CAD projects had been awarded by MOWR. Most of the reports have been submitted to the MOWR. The major findings are as under :

- Enforcement of Warabandi has helped in equitable distribution of water among farmers and in improving utilisation of irrigation potential as well as agricultural productivity.
- The extension service support has been considered very important to help the farmers in their decision making in switching over from dry land crops to irrigated crops.
- Suitable cropping pattern and improved variety of crops having better water efficiency have been introduced in many irrigation projects replacing non-remunerative crops.
- The major constraints for ground water development includes small and fragmented holdings, poor economic status of farmers, cumbersome institutional financial support and poor supply of electricity and diesel to operate pump sets, availability of inadequate subsidy to farmers.
- For achieving efficiency in irrigation, emphasis have to be given to the maintenance of the system.

FARMERS' PARTICIPATION

25. Participation of farmers in irrigation management implies a significant role of water users in decision making. It is a role which goes beyond mere consultation. It implies an active role of beneficiaries in all the facets of irrigation water management and its attendant forward and backward linkages with main system management in agricultural/agronomic activities. This role is very different from the traditional passive role of farmers to look to the Department for irrigation water supply and its distribution. In order that farmers play an active part in decision making, there is a need to evolve appropriate forms of local organisation. The irrigation agency can clearly facilitate this process by developing a planned interaction/intervention strategy. The timing of farmers' involvement is crucial. Farmers' participation is most effective when it takes place from the initial stages of project development, including the stages of project formulation and design. Such involvement forms part of ideal conditions for genuine participation for a true partnership between farmers and government. There are successful examples of farmers' associations (which are also known as Water Users' Associations) managing irrigation systems, both traditional as well as contemporary. These are nevertheless, quite isolated, scattered and site specific in the sense that such successful experiments have, curiously enough, not spread

further to other areas or even in the adjoining block(s) of the same command. There are about 26771 WUAs in various forms in the States of Andhra Pradesh, Gujarat, Haryana, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Himachal Pradesh, Karnataka, Uttar Pradesh and Assam in India. But total area as presently managed by all such WUAs is estimated to be about 5759.23 th. Ha.

FLOOD CONTROL

26. Out of a total geographical area of about 329 m. ha., roughly about $1/8^{th}$ has been assessed as flood prone. Out of this about 32 m. ha. has been estimated as protectable. After the disastrous floods experienced in the country in 1954 a National Programme of Flood Management was launched. So far various methods of flood protection, both long term and short term have been adopted in different States depending upon the type of problem and local conditions. From March, 1954 to March 1992, barring occasional breaches in embankments, various types of flood control works as executed have provided reasonable protection to an area of about 14.20 million ha. The total area benefited upto the end of Eighth Plan is 1.8 m. ha. This excludes the area (about 3 million hectares) protected prior to 1954 by works which already existed in some of the States. Apart from these works, reservoirs with the specific flood cushion have been constructed in the country to provide protection to downstream areas. In addition, such multi-purpose storages have helped greatly in moderating the intensity of floods in the flood plains lower down.

27. The following Table 6.2.5 indicates the outlay and expenditure for flood management works during the Ninth Plan.

TABLE 6.2.5
Plan Outlays And Expenditure

(Rs. crore)

Year	Central Sector		State Sector	
	Approved Outlay	Actual/Ant. Expenditure	Approved Outlay	Actual/Ant. Expenditure
Ninth Plan	716.13		2222.36	--
1997-98	86.54	48.47	371.35	378.14
1998-99	91.75	55.87	348.48	303.60
1999-2000	61.79	67.05	662.36	559.04
2000-2001	154.87	--	NA	--

28. Against the approved outlay of Rs.440.23 crore for flood control programme both in Central and State sector during 1998-99, the anticipated expenditure is Rs.359.47 crore. During the year, the states like Assam, Bihar, Uttar Pradesh and West Bengal suffered flood menace due to unusual floods in these States. Relief was provided by the Centre to affected States to mitigate the suffering of the people. Since improper maintenance of flood control works leads to extensive damage, it is necessary to ensure proper maintenance by adequate provision of maintenance funds by the States. It should also be ensured that ongoing protection works with strict prioritisation are completed on a time- bound basis.

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29. In view of heavy relief expenditure incurred year after year on flood affected areas, priority needs to be given to complete the works in hand. Research and development activities in respect to flood control works also need to be intensified.

30. In addition to progress made on structural flood protection measures, the flood forecasting and warning of incoming floods has played a great role in mitigating the loss of life and movable property apart from alerting the organisations in charge of various engineering works. The Central Water Commission is entrusted with this work in respect of all the inter-State rivers. To assist the States in framing the flood plain zoning legislation a model Bill was circulated to States in 1975. The State Governments are being persuaded to enact the legislation on the basis of the Model Bill so that unplanned and unregulated development and encroachment into flood plains could be stopped and increasing trend in flood damage is reversed. Only Manipur State has so far enacted the legislation.

WATER RATES

31. According to the National Water Policy (1987), water rate should be such as to convey its scarcity value to the users and motivate them in favour of efficient water uses, besides, at the same time, being adequate to cover annual maintenance and operation charges and recover a part of the fixed cost. Agricultural productivity per unit of water needs to be progressively increased in order to be able to compete with other higher value uses of water.

32. The Planning Commission had set up a Water Pricing Committee popularly known as Vaidyanathan Committee. Subsequently a Group of Officials was constituted by the Planning Commission to consider the recommendations made by the above Committee. This Group unanimously recommended that full O&M cost should be recovered in a phased manner i.e. over a 5 year period starting from 1995-96 taking into account the inflation also and that subsequently after achieving the O&M level the individual States might review the status to decide on appropriate action to enhance the water rates to cover 1 per cent of the capital cost also. In addition, the setting up of Irrigation and Water Pricing Boards by all the States and mandatory periodic revision of water rates at least every 5 years with an opportunity for users to present their views were also recommended. Further, the Group also recommended the formation of Water Users Associations and the transfer of the maintenance and management of irrigation system to them so that each system may manage its own finances both for O&M and eventually for expansion/improvement of facilities.

33. Most of the States have at present very low water rates at substantially varying levels and some of them have not revised these for the last 2-3 decades. Most of the North-Eastern States (except Assam and Manipur), do not even charge any irrigation water rate. Maharashtra is the only State where water rates are announced for a 5 years period at a time with a provision for 10 per cent increase per annum so as to cover the full O&M cost as well as interest payable on the public deposits raised through irrigation bonds. The State Governments of Andhra Pradesh, Madhya Pradesh, Rajasthan, Maharashtra, Haryana and Orissa have revised the water rates recently.

34. During the meetings of the Working Group to discuss the Annual Plan 2000-01, the State Governments have been requested to revise the water rates to reach a level that at least O&M expenses were covered. They have also been advised to cut down the establishment cost and to improve the collection efficiency of the Water rates.

EXTERNAL ASSISTANCE FOR DEVELOPMENT OF WATER RESOURCES

35. The task of development of water resources in various regions of the country requires large financial investments. The external assistance from different funding agencies is required to fill up the resource gap for implementation of projects for development of water resources.

36. The World Bank continues to be the primary source of external assistance in this sector. The other donors are EEC, OECF-Japan, KFW Germany and Government of Netherlands etc. A statement showing the status of state-wise water resources projects is enclosed in the Annexure-6.2.8.