

Development and Management of Water Resources in Maharashtra

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ABSTRACT: *Irrigation is the basic input for the development of agriculture from rain fed to the commercial one. The progress made by the Maharashtra State in respect of creation of irrigation potential and its utilisation is very dismal. The actual utilisation of the available potential is less than 50 per cent, leaving a huge gap between creation and utilisation of the irrigation potential. The main causes of under utilisation of irrigation potential include incomplete land development works, non-maintenance of distribution system, heavy transit and seepage losses, cultivation of sugarcane, water logging and salinity, unrealistic cropping pattern, and inadequate supply of credit and farm inputs.*

Measures suggested for conjunctive use of irrigation water are: lining of canal and distribution system to reduce transit and seepages losses, use of drip and sprinkle irrigation methods, implementation of rotational water supply system and water harvesting.

Keywords: *Irrigation potential, potential created, irrigated area, transit losses, seepages, drip irrigation, sprinkle irrigation and rotational water supply system.*

I. INTRODUCTION

Irrigation is the basic input for the transformation of agriculture from subsistence to the commercial one. Although India has created a substantial irrigation potential, the utilisation of irrigation potential so far created in the country continues to be unsatisfactory. The position of the Maharashtra State in respect of creation of irrigation potential and its utilisation has been very disappointing. The state government is concerned about the full exploitation and efficient management of the available water resources ever since the formation of the state but the gap between the potential created and utilised has been widening.

The State Irrigation Commission has estimated the ultimate irrigation potential at 70.61 lakh hectares both from the surface and underground water resources. The latest estimates indicate that about 84 lakh hectares i.e. 46 per cent of the cultivable area can be brought under irrigation from all sources. The gross irrigated area in the state is hardly 18 per cent to the total cropped area as against 42 per cent in the country as a whole.

Objectives of the Study

- To study the development and management of water resources in Maharashtra
- To find out the extent of utilisation of created irrigation potential in the state
- To investigate various reasons for under-utilisation of created irrigation potential
- To suggest remedial measures to improve the utilisation of existing irrigation potential.

Need for Irrigation Development

The development, management and conservation of water resources and irrigation water in the state is absolutely necessary due rugged topography and scanty water resources in the state, rainfall is inadequate, erratic and uncertain, only 30 per cent total cropped area can ultimately be irrigated, about 94 talukas i.e., 38 per cent of the total area is chronically drought prone, gross irrigated area is only 18 per cent of against 42 per cent in the country, and low agricultural productivity due to insufficient irrigation facilities.

II. METHODOLOGY

The present paper is primarily based on secondary sources of data such as published reports of various irrigation commissions and committees, Five year and annual plans, economic surveys, government publications, and other publications of the irrigation department. Simple statistical techniques like average and percentage is used for calculation purpose.

Review of Literature

The problem of irrigation development and utilisation of created irrigation potential has been studied by various commissions and committees from time to time. The Sukhatankar Committee¹ (1973) has identified

87 talukas in 12 districts, which account for 35 per cent area of the state, as chronically drought prone. Further, Dr. Subramanian Committee² (1987) by adopting new criterion identified 94 talukas accounting for nearly 38 per cent area, as drought prone. The Maharashtra State Irrigation Commission³ (1962) stated that it is absolutely necessary to complete the work of full exploiting the irrigation potential of the state by 1980. The 'Phad' system of irrigation in Dhule district was the oldest irrigation system in the state. There were 45 diversion bandharas across the river Panzra, irrigating about 3035 hectares area.⁴ A detailed evaluation study of Mula Irrigation Project carried out by the Water and Land Management Institute, Aurangabad⁵ (1982) showed that the utilization on this project was about 52 per cent of the potential created. The lag in utilization was attributed to delayed work of the canals and distribution system and cultivation of higher percentage of sugarcane, summer groundnut and higher seepage losses.

Ashok Mitra⁶ studied of the planning and implementation of Mula Project and the management of water distribution with a view to ascertain the factors responsible for long gestation period and of underutilization of irrigation potential. The work of this project was much delayed on account of problems of foundation and the completion of distribution network, frequent changes and modification in the original project proposal. The underutilization of created irrigation potential was due to slow progress of the construction of distribution system and outlets. The evaluation study undertaken by the Directorate of Economics and Statistics⁷ (1994) reveals that the extent of utilisation of irrigation water on Jayakwadi, Girna, Pench and Khadakwasla was about 56 per cent due to reasons such as inadequate rainfall and storage of water, non-completion of distributaries and field channels, incomplete land development works, silting/ damage of field channels and no water to tail-end farmers. In respect of speedy utilisation of available irrigation potential, the Kasbekar Study Group⁸ (1986) recommended that all the three agencies, viz., water management, land development and irrigation extension, should be placed under one department i. e. the Irrigation Department. Different departments have to work together, separately but not independently, having synchronised action to achieve the common goal of full utilisation of irrigation water.

Water Resources in the State

Agriculture accounts for about 81 per cent use of water mainly for irrigation purpose, whereas demand for water by agriculture sector is likely to increase up to 87 per cent by 2030. Basin-wise available water resources in the state are as under.

Table 1: Basin-wise Water Resources and Demand in the State

Basin	Available Water for Use (Mm3)	Demand for Water by 1996 (Mm3)			Demand for Water by 2030 (In Mm3)		
		Total	Agriculture	%	Total	Agriculture	%
Godavari	38882	17969	16653	92.67	43446	40384	92.95
Tapi	9324	4531	4126	91.06	12234	10562	86.33
Narmada	343	33	29	87.88	251	245	97.60
Krishna	18356	13324	9471	71.08	32393	27438	84.70
WFRK	72322	3626	1811	49.94	15380	12030	78.22
Total:	139227	39483	32090	81.27	103704	90660	87.42

WFRK: West flowing rivers of Konkan.

Source: Maharashtra Development Report, Planning Commission, Government of India, New Delhi, 2007, p.140.

Ultimate Irrigation Potential

Total cultivable area of the state is 182 lakh hectares. The Ultimate irrigation potential is estimated at 84 lakh hectares. Surface irrigation potential is 60 lakh hectares, while underground irrigation potential is 24 lakh hectares. About 46% of the total cropped area can be irrigated from all sources.⁹

Irrigation Potential Created and Utilised

Progress of irrigation potential by major, medium and state sector minor irrigation projects during different five year plans indicates that the cumulative irrigation potential created has increased from 2.74 lakh ha. to 48.24 lakh ha. during the period 1951-52 to 2010-11 as shown below.

The actual utilisation of created irrigation potential rose from 1.98 lakh ha. to 29.55 lakh ha. during the same period. The per cent utilisation of available irrigation potential has declined from about 72 per cent in 1951-52 to 61 per cent in 2010-11. This reveals that the gap between potential created and utilised has been widening and the position of the state in this respect is very dismal. The government has invested more than Rs.

72000 crores in irrigation sector to harness the utilisable water resources but irrigation development in the state has been very tardy.

Table 2: Financial Expenditure, Irrigation Potential Created and Utilised in the State

Year	Cumulative Expenditure (Rs. Crores)	Irrigation Potential Created (Lakh Ha.)	Irrigation potential Utilised (Lakh Ha.)	Per cent Utilisation
1951-52	16.60	2.74	1.98	72.26
1960-61	58.64	3.98	2.26	56.78
1970-71	416.49	7.18	3.85	53.62
1980-81	1149.37	17.21	7.18	41.72
1990-91	4312.55	25.58	10.76	42.06
2000-01	13074.0	38.12	18.42	48.32
2010-11	25353.0	48.24	29.55	61.25

Source: Eleventh Plan (2007-2012) and Economic Survey of Maharashtra, 2011-12, Directorate of Economics and Statistics, Planning Department, Mumbai, p.83.

The gross irrigated area to gross cropped area in the state has increased from 6.5 per cent in 1960-61 to about 18.0 per cent in 2011-12 against more than 42 per cent in the country as a whole.

Command Area Development Authorities (CADA)

Problems of major project are delayed schedules and completion, cost escalation, and underutilisation of created potential. Therefore, CADA programme launched in 1974-75 with a objective to increase use of irrigation water. Its activities involve construction and lining of field channels and water courses, construction of field drains, introduction of Warabandi/RWSS, on farm development, adoption of suitable cropping pattern, conjunctive use of available water, education, extension and training for farmers, timely supply of inputs and credit. About 9 CADA Authorities are set up in the state and all the major and medium projects are covered.

Causes of Tardy Irrigation Development

Causes of inadequate development of irrigation facilities are delay in administrative approvals and re-approvals from Government of India, delay in land acquisition from forest department and farmers and also delay in farmers' rehabilitation, delay in execution and Completion of irrigation projects, cost escalation due to inflation and rising prices, and inadequate allocation of funds.

Causes of Under-Utilisation of Irrigation Potential

The study conducted by the Indian institute of Management, Bangalore¹⁰ shows that the created irrigation potential was not fully utilized on account of inadequate water storage in the dam due to scanty rain fall, cultivation of sugarcane and banana, inadequate demand for irrigation water during kharif season, increased demand for water from urban areas, incomplete works of distribution system, non-maintenance of canals, distributaries and field channels, Inadequate participation of farmers in the management and distribution of water, and decrease in the water storage capacity of projects due to siltation.

There are numerous causes responsible for under-utilisation of irrigation potential in the state such as: failure of monsoon and inadequate supply of irrigation water in the reservoir, non-construction or defects in construction of canals and distribution system, non-maintenance or ill-maintained distribution system, water logging, salinity and lack of drainage system, inadequate response to kharif irrigation, unrealistic cropping 4 pattern, cultivation of high water consuming perennial crop like sugarcane, heavy transmission losses and seepages, even up to 50 to 55 per cent, poverty and Lack of credit and other farm inputs like seeds and fertilizer, and lack of education, extension and training to farmers.

Measures to Improve Utilisation of Created Irrigation Potential

Various commissions and committees have suggested numerous measures to improve the utilization of available irrigation potential in the state which include: early completion of irrigation projects which are in advance stage of completion, where more than 75% work is completed, lining of canals and entire distribution system to reduce seepages and transit losses, provision of drainage to reduce water-logging and salinity of land, introduction of Warabandi or Rotational Water Supply System to ensure supply of irrigation water, supply of water on volumetric basis, establishment of water users' association /pani vatap samities in large number, watershed development Programme and rain water harvesting through K.T.Wares, bandharas, nalla bunds, dugout ponds, eight monthly supply of water to kharif and rabi crops and no supply of water to perennial crops

like sugarcane cultivation, linking of rivers in the state particularly rivers of Vidharbha and Marathwada, application of micro irrigation like sprinkler and drip which can save about 48% of water.

III. CONCLUSION

Irrigation sector in Maharashtra is the largest in the country. The irrigation policy should assign first priority to complete ongoing irrigation projects which are in advanced stage of development. The Government should earmarked sufficient funds for this sector in the state budget. It is also essential to manage and suggest strategies for improving the performance of irrigation sector and also to solve water related disputes in the state.

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