

## Chapter 1

### Introduction

#### 1.1 State Profile

Maharashtra with a geographical area of 308 lakh hectare (ha) is the second largest State in the Union of India in terms of population as well as area. The projected population of the State as per census 2011 was 11.24 crore of which 54.77 *per cent* lives in rural areas and depended largely on agriculture for their livelihood. Maharashtra is a water stressed State and depends heavily on rainfall which varies from 400 mm to 6000 mm annually. The vagaries of monsoon causes frequent drought in many areas of the State.

The entire State is traversed by five river basins *viz.* Krishna, Godavari, Tapi, Narmada and west flowing rivers in the Konkan region.



Source: website of Water Resource Department

The annual average available yield of water for the State drained by these rivers is 163.82 Billion Cubic Meter (BCM). The permissible use of water based on the Tribunal Award/Committee Reports is 125.936 BCM<sup>1</sup>. The average annual availability of water in the four river basins (Krishna, Godavari, Tapi, and Narmada) is 58 *per cent*. Approximately 49 *per cent* of the area of these four river basins supporting 43 *per cent* of the population is considered as deficit or highly deficit in regard to water availability.

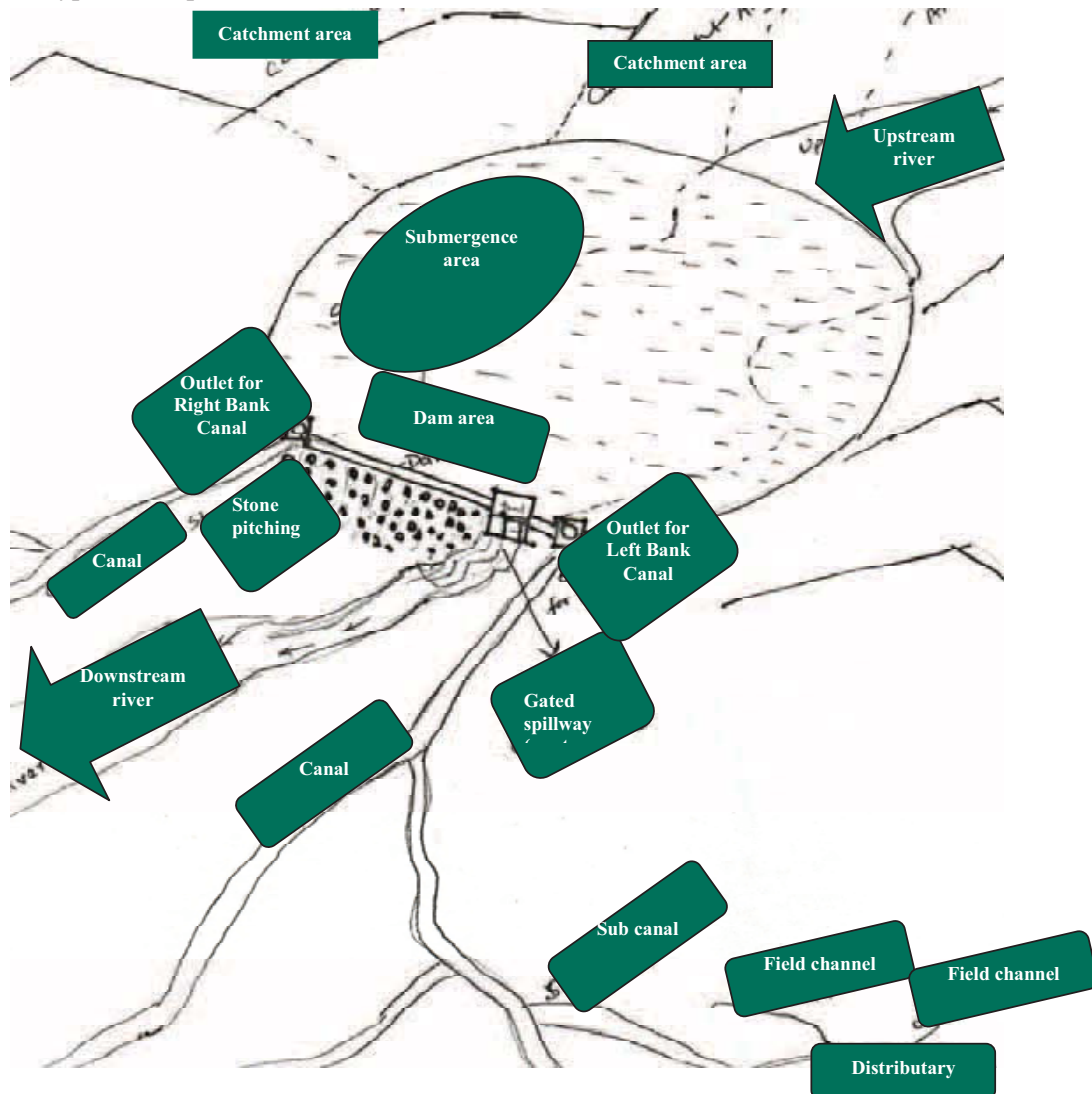
The Subject 'water including irrigation and canal, drainage and embankments, water storage and water power' falls under list II of the Seventh Schedule of the Constitution of India. Further, the Central Government is conferred with powers to regulate and develop inter-State rivers under List I of the Seventh Schedule to the extent declared by the Parliament by law to be expedient in the public interest.

A typical dam is a wall of solid material built across a river to block the flow of the river. The continuous flow of water from the river upstream of the dam accumulates in the reservoir formed upstream of the dam. Depending on the purpose, water from a dam is released into canals for irrigation purpose or into pipelines to supply water to a city or to a hydro-electric power station to

<sup>1</sup> Godavari-34.185 BCM, Tapi- 5.415 BCM, Narmada-0.308 BCM, Krishna-16.818 BCM, West flowing rivers-69.210 BCM

generate electricity. Excess water in the storage reservoir is released through spillway to prevent water flow over top of the dam. The water in the dam is released in controlled quantum as required from an outlet valve into the Left and Right Bank Canals. The water from the canals flow through sub-canals, distributaries, minors and finally into the fields through field channels to irrigate the command area. The total gross area proposed to be irrigated under more than one crop during the same year is counted as many times as the number of crops grown and irrigated is termed as Irrigation Potential (IP) created. In the State of Maharashtra, IP is created through three entities namely the State Sector under the Water Resources Department<sup>2</sup> (WRD), the Local Sector under the Minor Irrigation<sup>3</sup> (Local Sector) and the Zilla Parishads<sup>4</sup>. This Report deals with the irrigation projects constructed and managed by the WRD.

The typical components of a dam are shown in the sketch below.



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<sup>2</sup> For irrigation projects with Culturable Command Area (CCA) above 250 ha

<sup>3</sup> For irrigation projects with CCA between 100 ha and 250 ha

<sup>4</sup> For irrigation projects with CCA below 100 ha

The WRD projected (2011-12) an IP creation of 66.14 lakh ha as on June 2011 against which, IP of 48.26 lakh ha has been created through 3,712 completed/ongoing projects in the State (98 major<sup>5</sup>, 259 medium<sup>6</sup> and 3,355 State sector minor<sup>7</sup> irrigation projects). Of these, 3,111 irrigation projects were completed as of June 2013. As against the IP of 48.26 lakh ha created in the State by the WRD, the IP utilised as on June 2012 was only 32.51 lakh ha *i.e.* 67.36 per cent.

## 1.2 Functions and organisational structure

All major, medium and minor irrigation projects which irrigate land areas of more than 250 ha are implemented by the WRD. These projects also cater to the needs of water for non-irrigation purposes like drinking water, industrial purposes *etc.* The irrigation projects are taken up for implementation after considering the techno-economic feasibility reports and getting the required land, environmental/forest clearance *etc.* for the project. The construction is done as per Maharashtra Public Works Manual (MPW Manual) and the Minor Irrigation Manual and after preparation and clearance of the design of the dams. The construction of projects is undertaken by the five Irrigation Development Corporations (IDCs) *viz.* Maharashtra Krishna Valley Development Corporation (MKVDC), Vidarbha Irrigation Development Corporation (VIDC), Konkan Irrigation Development Corporation (KIDC), Tapi Irrigation Development Corporation (TIDC) and Godavari Marathwada Irrigation Development Corporation (GMIDC). The completed irrigation projects are handed over by the IDCs to the Maintenance Divisions of WRD, while the Command Area Development works in the form of renovation and repairs of canals/sub-canals/minors/distributaries/field channels are done by the Command Area Development divisions. The WRD also has 10 support organisations headed by the officers of the rank of Chief Engineers dealing with inspection of dams, quality control, imparting of training, soil survey, design of dams *etc.* The organizational structure and functional responsibilities amongst the different organizations are indicated in **Appendix 1.1**. A glossary of the terms used in the report is indicated in **Appendix 1.2**.

The WRD (Irrigation Department till October 2004) is headed by Principal Secretary, Water Resources Project and Development (WRP & Development) and Principal Secretary, Water Resources Management and Command Area Development (WRM & CAD). They are assisted by six Joint Secretaries, 11 Deputy Secretaries including an Internal Financial Advisor. The IDCs are headed by the officers of the rank of Secretary to the Government of Maharashtra (GoM) designated as Executive Directors.

The five IDCs were established through Acts enacted between 1996 and 1998 to ensure proper utilization of water allocated to the State by the various Tribunals, to accelerate the completion of irrigation projects and to raise the funds through open market borrowings. The Acts envisaged independence to IDCs to grant approval to works, levy and collection of water charges and

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<sup>5</sup> Projects having culturable command area (CCA) of above 10,000 ha

<sup>6</sup> Projects having CCA above 2000 ha and up to 10,000 ha

<sup>7</sup> Projects having CCA of up to 2000 ha; WRD deals with the Minor projects having CCA from 251 to 2000 ha and minor project having CCA up to 250 ha are dealt with by the Rural Development and Water Conservation Department, Government of Maharashtra

commitment by Government to provide specific grant to the IDCs in the form of share capital in the initial years. The power to levy and collect water charges by the IDCs were withdrawn (2004) by the Government and funds were provided to the IDCs through budgetary grants.

Maharashtra has carried out a number of reforms in the management of water and is the first State to initiate water audit and benchmarking of irrigation projects. Some of the water sector reforms initiated by Government of Maharashtra (GoM) are State Water Policy, 2003, Maharashtra Water Resources Regulatory Authority (MWRRA) Act, 2005 and Maharashtra Management of Irrigation Systems by Farmers Act, 2005.

### **1.3 Acts, policies, directives and recommendations governing the functioning of the Water Resources Department**

The various Acts, policies and directives governing the functioning of WRD are discussed briefly in **Table 1.1**.

**Table 1.1: Various Acts, policies and directives**

Sr. No.	Acts and policies	Salient features
1	2	3
1	Maharashtra Irrigation Act, 1976	To unify and amend the law relating to irrigation in the State, to provide for charging water rates on lands under the irrigable command of canals.
2	Governor's directive	The State of Maharashtra (Special Responsibility of Governor for Vidarbha, Marathwada and Rest of Maharashtra) Order, 1994 made by the President of India under Article 371(2) of the Constitution of India assigned the Governor of Maharashtra special responsibility under Article 371 of the Constitution in respect of the areas of Development Boards for Vidarbha, Marathwada and Rest of Maharashtra. On 30 April 1994, the Governor of Maharashtra issued "Development Boards for Vidarbha, Marathwada and Rest of Maharashtra order, 1994" constituting separate Development Boards for Vidarbha, Marathwada and Rest of Maharashtra regions. According to Rule 7 of the said orders the Governor of Maharashtra has a special responsibility of ensuring equitable allocation of funds for development expenditure over the areas of Development Boards, subject to the requirements of the State as a whole. The Governor appointed Indicators and Backlog Committee in 1995, which estimated irrigation backlog of ₹ 7,418 crore as on 31 March 1994. After considering the views of various departments, the reconstituted Indicators and Backlog Committee estimated the backlog at ₹ 6,618.37 crore. The GoM and the Governor accepted the recommendation in November 2000 and the allocation for backlog removal on the basis of this report was first made in the Annual Plan for the year 2001-02 based on the Governor's directive.
3	Maharashtra Krishna Valley Development Corporation Act, 1996 (MKVDC)	MKVDC was established under the Act to promote and operate irrigation projects, development of Command Area and generation of hydro power through harnessing water of Krishna River allotted to the State by the Krishna Water Dispute Tribunal in 1976. The jurisdiction is spread fully over five districts viz. Pune, Satara, Sangli, Solapur, Kolhapur and partly over Ahmednagar, Beed and Osmanabad districts. The powers under the Act were exercised by the Governing Council (GC) of MKVDC.

1	2	3
4	Vidarbha Irrigation Development Corporation Act, 1997 (VIDC)	VIDC was established under the Act to complete ongoing Irrigation projects in Vidarbha region. The powers under the Act were exercised by the GC of VIDC. Its jurisdiction is spread over the 11 districts of Vidarbha <i>i.e.</i> Akola, Amravati, Bhandara, Buldhana, Chandrapur, Gadchiroli, Gondia, Nagpur, Wardha, Washim and Yavatmal.
5	Godavari Marathwada Irrigation Development Corporation Act, 1998 (GMIDC)	GMIDC was established under the Act for speedy utilisation of sanctioned water of Godavari river to the State in Godavari Basin (including the eight districts of Marathwada and two districts of rest of Maharashtra <i>i.e.</i> Ahmednagar and Nashik). The powers under the Act were exercised by the GC of GMIDC.
6	Tapi Irrigation Development Corporation Act, 1998 (TIDC)	TIDC was established under the Act to increase the irrigated area in Tapi basin which was having low per capita water availability. The powers under the Act were exercised by the GC of TIDC. Its jurisdiction is spread over four districts <i>viz.</i> Dhule, Jalgaon, Nandurbar and Nashik (partially).
7	Konkan Irrigation Development Corporation Act, 1998 (KIDC)	KIDC was established under the Act to complete ongoing projects in Konkan region covering the districts of Raigad, Ratnagiri, Sindhudurg and Thane The powers under the Act were exercised by the GC of KIDC.
8	High Power Committee for determining priority in execution of projects	A committee headed by the Chief Secretary decided in its meeting held in November 2001 and communicated (January 2002) to all the IDCs to prioritize the work and not to take up any new work.
9	High Power Committee for sectoral allocation of water	A Committee headed by the Minister of Water Resources was formed in 2003 for deciding the sectoral allocation of water amongst drinking, industrial and irrigation purpose. After an amendment to the MWRRA Act, 2005 in the year 2011, the work of sectoral allocation of water was taken over by the GoM.
10	State Water Policy 2003	The policy is based on river basin based planning and management of water resources through a regulatory authority and river basin agencies, improving service delivery through water use entitlements, bulk supply, charging on volumetric basis and private sector participation.
11	Maharashtra Water Resources Regulatory Authority Act, 2005 (MWRRA)	MWRRA was established under the Act to regulate water resources within the State of Maharashtra, facilitate and ensure judicious, equitable and sustainable management, allocation and utilisation of water resources, fix the rates for use of water for agriculture, industrial, drinking and other purposes. The MWRRA was responsible for preparing an annual report, containing the irrigation backlog of each district based on the State average, to be submitted to the State Legislature through the Government. The MWRRA was to ensure that the allocations of funds as directed by the Governor were adhered to by the Government.
12	Maharashtra Management of Irrigation System by Farmers Act, 2005 (MMISF)	MMISF was established on the recommendation (1999) of the Maharashtra Water and Irrigation Commission that statutory provisions be made for management by farmers of irrigation systems by providing water from public canal system to Water Users' Associations on volumetric basis. The Act deals with the issues such as bridging the gap between IP created and its actual utilisation by ensuring proper use of surface and ground water by increased efficiency in distribution, delivery, application, drainage of irrigation system.  The implementation of the Act was ensured by IDCs and the Maintenance Divisions of WRD, through the formation of Water Users' Associations.



### **1.3.1 Inconsistencies in IDC Acts**

The five IDCs were established between 1996 and 1998 under the respective IDC Acts. However, the provisions of the Acts of the five IDCs were inconsistent with each other. Though there are similarities in planning, investigation, construction and management of irrigation projects, command area development *etc.* the following inconsistencies remain:

- The powers to accord Administrative Approvals/Revised Administrative Approvals are provided in the Acts of MKVDC and TIDC since inception, while these powers were brought at par with the remaining IDCs *viz.* VIDC, GMIDC and KIDC from December 2003 for removal of backlog only by an executive order (**paragraph 3.2.5** of this Report refers).
- While the VIDC and the KIDC Acts provided for making interest bearing monetary advances to the contractors, there was no such provision in the MKVDC, GMIDC and TIDC Acts. Inconsistencies in sanction of mobilization advances to contractors are discussed in **paragraph 3.3.3** of this Report.
- The GoM has the powers to make Rules under Section 67 of the IDC Acts however, no such Rules for any of the IDCs were framed as of December 2013.

### **1.4 Audit scope and methodology**

A performance audit was conducted between April and December 2012 through test-check of records in Mantralaya and field offices including the five IDCs, covering the period from 2007-08 to 2012-13 for macro level analysis and 2009-10 to 2011-12 for micro level analysis in the field offices including the five IDCs. The facts and figures have been updated up to June 2013 based on the latest information/progress reports made available by WRD/IDCs. For the purpose of performance audit, 87 irrigation projects (62 ongoing and 25 completed) were selected<sup>8</sup> from all the five IDCs for detailed scrutiny using stratified sampling method including the projects selected based on risk assessment (**Appendix 1.3**). Records of seven Chief Engineers in the four<sup>9</sup> regions looking after the maintenance of irrigation projects and support organisations *viz.* Dam Safety Organisation, Central Design Organisation and Quality Control Assurance and Vigilance Organisation were also test-checked. In addition, joint physical verifications were conducted along with the representatives of the WRD. Data analysis of water account was also carried out. An entry conference was held on 3 May 2012 with Principal Secretary, WRD and a meeting was also held on 1 September 2012 with the Principal Secretary, WRD. An exit conference was held on 15 July 2013 with the Principal Secretaries of WRD. As regards non-compliance to the Governor's directives, the Planning Department stated (September 2013) that relevant files were destroyed in fire that broke out at Mantralaya on 21 June 2012 and therefore, the said compliances to the Governor's directives were delayed. The

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<sup>8</sup> Types of projects adopted for the purpose of sampling and performance audit (i) Major project: Expenditure more than ₹ 200 crore (ii) Medium projects: more than ₹ 50 crore and (iii) Minor projects: more than ₹ 10 crore

<sup>9</sup> Aurangabad, Konkan, Nagpur and Pune

replies furnished (July to December 2013 and January 2014) by the WRD have been suitably incorporated at appropriate places.

### 1.5 Audit objectives

The audit objectives were to assess whether:

- planning, execution and maintenance of projects were done properly;
- budgeting was realistic and adequate funds were released and utilized for timely completion and maintenance of projects;
- water user charges were properly assessed, levied and collected and formation of water users' associations monitored;
- the targeted IP and water storage was created and utilized;
- the safety measures and quality control measures were followed; and
- adequate monitoring and control mechanism were in place.

### 1.6 Audit criteria

The main audit criteria adopted for conducting the performance audit were:

- Water Policy, 2003 of GoM;
- Acts of all the IDCs;
- Maharashtra Water Resources Regulatory Authority Act, 2005;
- Maharashtra Management of Irrigation Systems by Farmers Act, 2005;
- Manuals of all the IDCs;
- Maharashtra Public Works Account Code and Maharashtra Public Works Manual;
- Minor Irrigation Manual;
- High Power Committee recommendations and Governor's directives; and
- Government resolutions and orders issued from time to time.

### 1.7 Previous audit findings

The following performance audits on WRD have been conducted and printed in the Reports of the Comptroller and Audit General of India (C&AG):

- Integrated Audit of Irrigation Department (2001-02);
- Users charges for water supply from irrigation projects (2002-03);
- Performance audit of Lift Irrigation Schemes (2004-05);
- Gosikhurd Irrigation project (2006-07);
- User charges for supply of water from Irrigation Project (2008-09);
- Minor Irrigation (Local Sector) Projects (2008-09)<sup>10</sup>
- Konkan Irrigation Development Corporation (2009-10); and
- Vidarbha Irrigation Development Corporation (2010-11).

The key issues highlighted in the performance audits were absence of long term planning and prioritisation of project execution in disregard of the recommendations of the High Power Committee; abnormal delays in completion of the projects and consequent increase in cost; commencement of works without acquisition of land and without obtaining clearances from the Ministry of Environment and Forest, Government of India; shortfall in utilisation of irrigation facilities created resulting in loss of revenue *etc.*

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<sup>10</sup> Under the Rural Development and Water Conservation Department

However, as detailed in this performance audit the deficiencies pointed out in the earlier reports still persist.

In addition to the performance audits mentioned above, 101 paragraphs have also been incorporated in the Reports of the Comptroller and Auditor General of India for the period from 2001-02 to 2011-12. Of the 101 paragraphs, 12<sup>11</sup> paragraphs and performance audit on Gosikhurd Irrigation Project (2006-07) were discussed by the Public Accounts Committee (PAC) in May 2012. Though the PAC had recommended<sup>12</sup> (September 2008 and May 2011) that responsibility be fixed and stringent action taken against the erring officials for non-achievement of the objectives, expenditure incurred on unviable projects, non-adherence to the agreement conditions *etc.* the WRD did not furnish any Action Taken Notes.

### **1.8 Acknowledgement**

Indian Audit and Accounts Department acknowledges the co-operation extended by the officials of the WRD, all the IDCs and their support organisations in conduct of the performance audit.

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<sup>11</sup> Paragraphs 4.2.5 and 4.4.12 of AR (Civil) – 2004-05; Paragraphs 4.2.6; 4.2.7 and 4.2.8 of AR (Civil) – 2005-06; Paragraph 4.3.9 of AR (Civil) – 2007-08 and Paragraphs 3.2.4, 3.2.5, 3.2.7, 3.3.5, 3.4.8 and 3.5.1 of AR (Civil) – 2008-09

<sup>12</sup> Four paragraphs in respect of Audit Report (Civil) for 2004-05 and 2005-06