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Report of the Comptroller and Auditor General of India on Management of Irrigation Projects

The Report has been laid on the table of the State Legislature Assembly on 14-06-2014

GOVERNMENT OF MAHARASHTRA

(Report No.3 of the year 2014)

Report of the Comptroller and Auditor General of India

on

Management of Irrigation Projects

Government of Maharashtra
Report No.3 of 2014

TABLE OF CONTENTS

PREFACE

1. This Report for the year ended 31 March 2013 has been prepared for submission to the Governor under Article 151 of the Constitution.

2. The Report contains the results of examination by Audit of 'Management of Irrigation Projects'.

3. The audit was conducted in conformity with the Auditing Standards issued by the Comptroller and Auditor General of India.

Executive Summary

Executive Summary

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. Approximately, 60 *per cent* of the State's population lives in rural areas and depends largely on agriculture for their livelihood. Maharashtra is a water stressed State and depends heavily on rainfall and the vagaries of monsoon cause frequent drought in many areas of the State. Irrigation projects are important as they store rainwater for use throughout the year. The Water Resources Department, Government of Maharashtra deals with construction and management of irrigation projects in the State. Water of the irrigation projects is used for drinking, irrigation and industrial purposes.

The Government of Maharashtra formed five Irrigation Development Corporations during 1996-98 to accelerate the execution of irrigation projects. As of June 2013, there were 601 ongoing irrigation projects being implemented by the five Irrigation Development Corporations. 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. The issue of the State Water Policy 2003, the enactment of the Maharashtra Water Resources Regulatory Authority Act, 2005 and Maharashtra Management of Irrigation Systems by Farmers Act, 2005 were other water reforms initiated by Government of Maharashtra. As of June 2011, irrigation potential of 48.26 lakh hectare has been created by the Water Resources Department through 3,712 completed and ongoing projects.

The Water Resources Department projected an irrigation potential creation of 66.14 lakh ha as of June 2011 against which, irrigation potential of 48.26 lakh ha has been created through 3,712 completed/ongoing projects in the State (98 major, 259 medium and 3,355 State sector minor irrigation projects). As against the irrigation potential of 48.26 lakh ha created in the State sector, the irrigation potential utilised as on June 2012 was only 32.51 lakh ha *i.e.* 67.36 *per cent*.

During the period from 2001-02 to 2011-12, seven performance audits and 101 draft paragraphs on the Water Resources Department were incorporated in the Audit Reports of the Comptroller and Auditor General of India. The key issues highlighted by audit were absence of long term plans, non-prioritisation of projects, delays in completion of projects, commencement of work without forest and environment clearances *etc*. The present performance audit on "Management of Irrigation Projects" covering a period 2007-13 is an attempt to review not only the individual irrigation projects selected in the sample but also discuss in sufficient detail the project level planning, tendering and contract management and project implementation. The performance audit also discuss at the macro level, implementation of the Governor's directives on backlog removal, granting of approvals to projects by the Irrigation Development Corporations, the role of Maharashtra Water Resources Regulatory Authority as a regulator, maintenance and safety aspects of the dams, levy and collection of water charges *etc.* The key findings are highlighted below.

Chapter 2 Planning and Financial Management

The State Water Policy of 2003 envisaged formation of River Basin Agency for each river basin which was to have the responsibility and authority for preparation of integrated river basin plans. Based on the plans of respective River Basin Agencies, the State was to prepare a State Water Resource Plan. However, the State Water Resource Plan was not prepared for development and management of water resources in the State. Maharashtra Water Resources Regulatory Authority cleared 189 projects during 2007-2013 though the State Water Resource Plan, based on which the projects were required to be cleared, was not prepared.

(Paragraph 2.2)

The need for prioritising the completion of ongoing projects was stressed from time to time through Governor's Directives, High Power Committee and Planning Commission recommendations. It was also expected that the backlog in physical terms would be liquidated as a result of enhanced allocation to the backlog districts. However, lack of prioritisation of projects as also new projects taken up in non-backlog districts resulted in thin spreading of the resources and consequently, the Water Resources Department was saddled with 601 projects which were under execution as on June 2013 with an estimated balance cost of ₹ 82,609.64 crore. The balance cost was nine times the capital grant of the Water Resources Department for the year 2012-13. Also, there was a physical backlog of 2.34 lakh ha in four districts of Akola, Amravati, Buldhana and Washim in the Vidarbha region as of April 2012.

(Paragraphs 2.4 and 2.5)

The implementation of Vishnupuri major irrigation project, initially approved in May 1979 at a cost of ₹ 32.24 crore, was hampered by frequent changes in the scope of work. The Water Resources Department accorded four Revised Administrative Approvals increasing/decreasing the scope (construction of barrages, length of canals, pumps for lifting water etc.) resulting in delays and increase in the cost of the project by ₹ 2,419.76 crore and shifting the water from the command areas of Vishnupuri project (downstream) to the command area of Jayakwadi project (upstream of Vishnupuri project). Further, environment clearance necessitated by an increase in the irrigation potential due to construction of 13 additional barrages, was not obtained from the Ministry of Environment and Forest.

(Paragraph 2.5.1)

Chapter 3 Project Execution and Contract Management

In 37 out of 87 test-checked projects on which an expenditure of ₹ 9,078.58 crore had been incurred, complete land (forest and civil) was not acquired before commencement of works thereby depriving the users of the benefits of the projects.

(Paragraph 3.2.3)

Estimates for irrigation projects were prepared without proper survey of dam sites leading to changes in the original design after issue of work orders. In 15 out of 87 test-checked projects, improper survey before commencement of

works resulted in an increase in cost of these projects by ₹ 209.79 crore, besides delaying their completion.

(Paragraph 3.2.4)

There was no well defined system of granting administrative approvals and revised administrative approvals to the irrigation projects by the Irrigation Development Corporations. Three Irrigation Development Corporations granted administrative approvals to 63 projects amounting to ₹ 2,467.94 crore in the non-backlog districts in violation of delegation of powers and the Governor's directives.

(Paragraph 3.2.5)

Of the 601 ongoing projects, 225 projects were under execution for more than 15 years of which, 77 projects were under execution for more than 30 years. In the test-checked projects, 16 projects were under execution for more than 30 years. Further, of the 601 ongoing projects, there was a cost overrun of ₹ 47,427.10 crore in 363 ongoing projects, while in 83 out of 87 test-checked projects, the cost overrun was to the extent of ₹ 12,807.64 crore.

(Paragraph 3.2.6)

The Irrigation Development Corporations violated the provisions of the Maharashtra Public Works Manual. Of the total 601 ongoing projects, in 21 ongoing projects an expenditure of ₹ 133.42 crore over and above 10 per cent of the administrative approvals amount was incurred, while in 100 ongoing projects an expenditure of ₹ 2,367.28 crore was incurred over and above the revised administrative approvals, without the approval of the competent authority. The Government incurred a financial liability of ₹ 90.04 crore in execution of Kondhane minor irrigation project, which was taken up without regulatory permissions and other mandatory clearances. The selection of contractor was not transparent and the award of work for increased height of the dam within 33 days of the initial award was irregular.

(Paragraphs 3.2.7 and 3.2.7.1)

The estimates for the projects were not prepared in sufficient detail. In 19 projects, 24 individual items of works like construction of tunnel work, ring road, Irrigation-Cum-Power-Outlet, canal work etc. amounting to ₹ 424.56 crore were attached irregularly to the respective original works without inviting tenders, in violation of the Maharashtra Public Works Manual. In five test-checked projects, extra items valuing ₹ 28.53 crore were irregularly sanctioned to the contractors.

(Paragraphs 3.3.1 and 3.3.2)

In 37 contracts, mobilisation advance of ₹ 478.95 crore was paid to the contractors though the contract conditions did not provide for such advance. There was short/non-recovery of royalty charges and insurance premium from the contractors to the extent of ₹ 9.82 crore.

(Paragraphs 3.3.3 to 3.3.5)

The monitoring and internal controls in the Water Resources Department were weak. Regular monthly meetings of the Governing Councils were not held by the Irrigation Development Corporations, in violation of the provisions of the Irrigation Development Corporation Acts. The State Level

Technical Advisory Committee established in October 2010, for scrutinising project proposals valuing ₹ 25 crore and above, did not have a member from the Central Water Commission for almost one year. In the absence of any Rules/Manuals, the State Level Technical Advisory Committee conducted the scrutiny of the proposals without any prescribed guidelines and time limits for clearance of projects were not adhered to. The Management Information System was poor due to discrepancies in various reports prepared by the Water Resources Department. The Maharashtra Water Resources Regulatory Authority also failed to perform its role as a regulator as envisaged in the Maharashtra Water Resources Regulatory Authority Act, 2005.

(Paragraph 3.4)

Chapter 4 Dam Safety and Quality Control

The Dam Safety Organisation did not follow the criteria for selection of dams for periodic inspections. At the end of March 2013, 348 large dams remained un-inspected for more than 10 years. The compliance to deficiencies pointed out in the health status reports of the dams was significantly low and ranged between less than one per cent and 43.81 per cent during 2007-12.

(Paragraphs 4.2.1 and 4.2.2)

Officers of the Quality Control Circles inspect the dam construction sites and issue 'Red Inspection Slips' in case of serious deficiencies are noticed during such inspections. Works should not resume unless the deficiencies pointed out in 'Red Inspection Slips' are rectified. However, execution of 30 out of 81 dam works, wherein 'Red Inspection Slips' were issued by the Quality Control Circles, were continued without obtaining OK cards.

(Paragraph 4.4.2)

While the Manual stipulating the inspection schedule was not prepared by the Nagpur and Aurangabad Quality Control Circles, there were shortfalls in inspections conducted by the Executive Engineers (6.25 per cent to 33.33 per cent), Sub-Divisional Engineers (3.33 per cent to 86.66 per cent), Assistant Engineers (1.5 per cent to 91.33 per cent) under the Quality Control Circle, Pune. Compliance to inspection notes of the Quality Control Organisation on the construction works was poor. Of the 5,991 inspection notes issued during 2009-13, forty per cent of the inspection notes (2,411) were outstanding.

(Paragraphs 4.4.3 and 4.4.4)

Chapter 5 Project performance

The irrigation potential created in the State Sector was 48.26 lakh ha as of June 2011 while that utilised as of June 2012 was 32.51 lakh ha i.e. 67.36 per cent of the irrigation potential created. While as against irrigation potential of 32.44 lakh ha created as of June 2013 from the projects handed over by the Government of Maharashtra to the five Irrigation Development Corporations and the projects subsequently taken up by them, the irrigation potential utilised as of June 2012 was 17.04 lakh ha (52.53 per cent).

(Paragraph 5.2.1)

The evaporation loss of live storage from dams increased from 17.58 per cent (2007-08) to 19.67 per cent (2011-12). Analysis of the Water Audit Reports

revealed that evaporation loss in 17 projects was more than 200 per cent of the live storage indicating incorrect assessment/compilation of data on evaporation losses.

(Paragraph 5.2.3)

Repairs and maintenance to dams and canals were poor due to insufficient allocation of funds or delay in taking up repair works. In two major projects (Khadakwasla and Kukadi) and two medium projects (Rajnala and Wadiwale), the irrigation potential utilisation was very low due to substantial leakages of water from Left Bank Canal/Right Bank Canal and delay in taking up concrete lining work for want of funds. In two major projects (Bhatsa and Ujjani) and in Hetawane medium project, there was loss of water due to leakages in the dams, sluice gates and damage to the rubber seal of emergency gates.

(Paragraph 5.2.4)

Any change in reservation of water by more than 25 per cent for non-irrigation purpose (domestic and industrial use) was subject to recovery of restoration charges. However, in two irrigation projects (Gangapur-Darna and Pawna) there was short/non-recovery of restoration charges amounting to ₹ 95.75 crore. In Hetawane project, in the absence of any specific time frame for the recovery of restoration charges, the reservation of water to four entities continued for three years without recovery of any charges and execution of agreements.

(Paragraphs 5.2.6, 5.2.6.1, 5.2.6.2 and 5.2.6.3)

The benchmark for average irrigation system performance was considered by the Water Resources Department at 130 hectare per million cubic metre of water. The Benchmarking Report prepared by the Water Resources Department revealed that in 2009-10, 30 out of 50 major projects and 78 out of 166 medium projects were less than the benchmark while in 2010-11 in 34 out of 50 major projects and 88 out of 171 medium projects, the area irrigated was less than the benchmark. The average canal conveyance efficiency of main canals in five regions during 2007-11 ranged between 8.68 per cent (Amravati) and 77.24 per cent (Aurangabad).

(Paragraphs 5.2.7 and 5.2.7.1)

Chapter 6 Levy and Recovery of Water Charges

The arrears of water charges for irrigation and non-irrigation purposes increased from ₹ 748.90 crore in March 2008 to ₹ 1,275.31 crore in March 2013 (70.29 per cent). During 2007-13, the arrears of water charges for irrigation purpose increased by 30.63 per cent while for non-irrigation purpose the increase was 138.56 per cent.

(Paragraph 6.2)

There was a short-recovery of water charges amounting to ₹ 10.42 crore from bulk users due to incorrect application of rates of which, an amount of ₹ 1.80 crore was recovered at the instance of Audit.

(Paragraph 6.3.1)

Chapter 1

Introduction

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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[1]. 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

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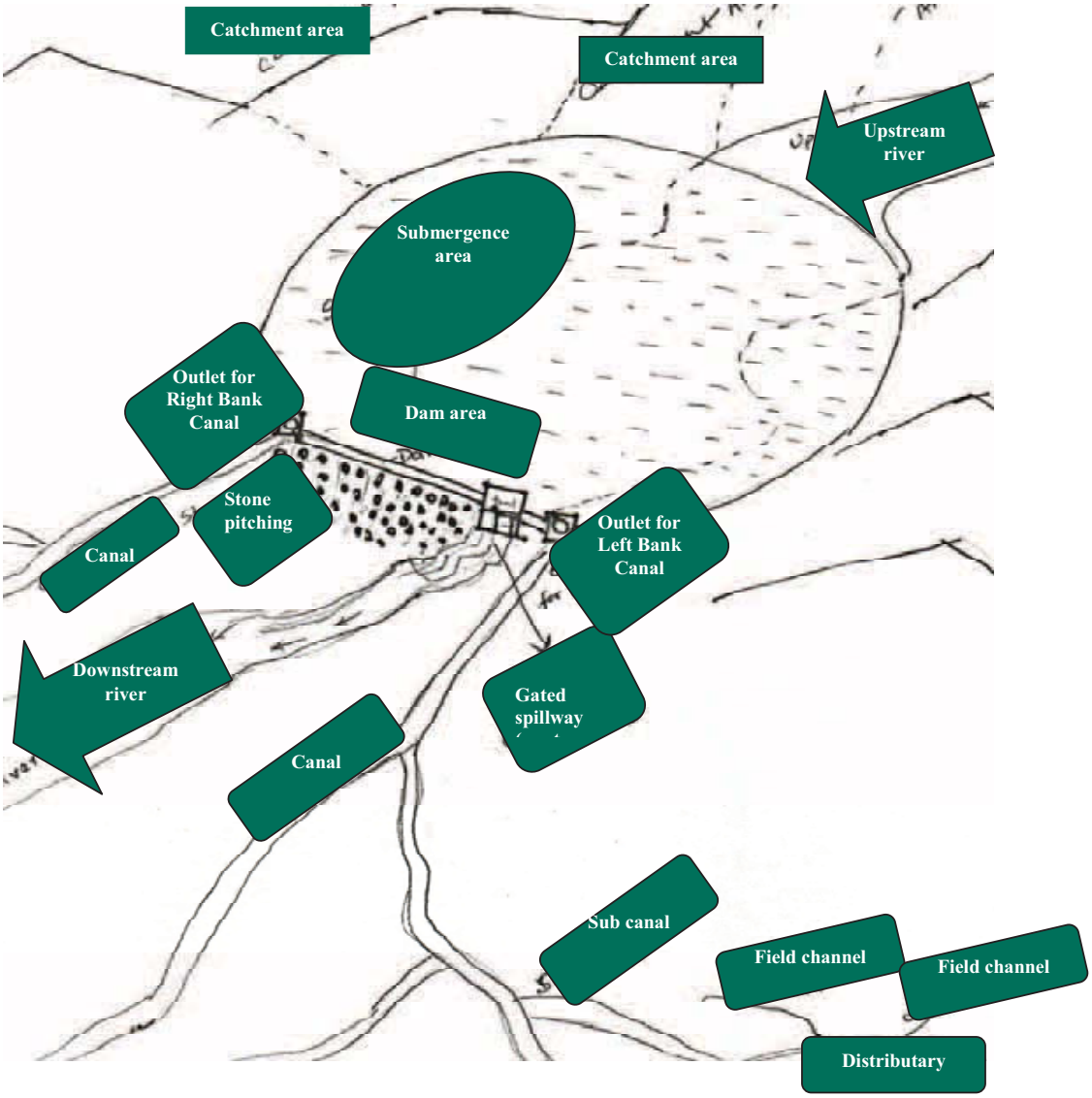
[1] Godavari-34.185 BCM, Tapi- 5.415 BCM, Narmada-0.308 BCM, Krishna-16.818 BCM, West flowing rivers-69.210 BCM

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[2] (WRD), the Local Sector under the Minor Irrigation[3] (Local Sector) and the Zilla Parishads[4]. 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.



2 For irrigation projects with Culturable Command Aarea (CCA) above 250 ha
3 For irrigation projects with CCA between 100 ha and 250 ha
4 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[5], 259 medium[6] and 3,355 State sector minor[7] 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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5 Projects having culturable command area (CCA) of above 10,000 ha

6 Projects having CCA above 2000 ha and up to 10,000 ha

7 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.e.* 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.e.* 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 *viz.* 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[8] 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[9] 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 Mantralya on 21 June 2012 and therefore, the said compliances to the Governor's directives were delayed. The

[8] 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

[9] 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)[10]
- 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*.

[10] 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[11] 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[12] (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.

[11] 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

[12] Four paragraphs in respect of Audit Report (Civil) for 2004-05 and 2005-06

Chapter 2

Planning and Financial Management

Chapter 2

Planning and Financial Management

2.1 Planning

For efficient and effective utilisation of water, a valuable natural resource, the need for an integrated long term plan for the State and a comprehensive plan for each of the river basins in the State is of vital importance. Such an integrated plan would ensure balanced development in the State as also meet the needs of diverse water users. The GoM formulated the State Water Policy (SWP) in 2003, as it recognized that the isolated and fragmented approach to surface and ground water development coupled with an increasing conflict among the competing users of water for various purposes and poor operation and maintenance of the created facilities in the water sector, resulted in poor service delivery and large gap in the IP created and utilized.

2.2 Non-preparation of State Water Resource Plan

The SWP, 2003 envisaged a unitary approach to surface and sub-surface water, adoption of river basin and sub-basin as a unit for planning, development and management of water resources and a multi-sectoral approach for the same. The State was to be divided into five river basin drainages and a River Basin Agency (RBA) was to be established for each basin. The RBAs were to have the responsibility and authority for the integrated planning, development and management of the water resources and watersheds of respective river basins, for flood management, drought management and operation and maintenance of water storage and delivery infrastructure. These RBAs were to prepare an integrated river basin plan with the effective inclusion and participation of representatives of all water user entities and other stakeholders. Based on the plans of respective RBAs, the State was to prepare a State Water Resource Plan (SWRP) to promote balanced development and proper coordination among diverse water users. MWRRA was responsible for the review and clearance of water resources projects by ensuring that the same were in conformity with the SWRP.

Scrutiny in audit revealed the following:

- SWRP was not prepared even after a lapse of 10 years (up to June 2013) since formulation of State Water Policy in 2003. The Government stated (July 2013) that out of 30 sub-basin wise plans to be prepared for Godavari basin, plans for 16 sub-basins were ready while the remaining were in advanced stage of preparation. The Government further stated that the other IDCs have been directed to initiate similar action. Thus, non-preparation of river basin plans led to non-preparation of SWRP.
- MWRRA cleared 189 projects during 2007-2013 though the SWRP, based on which the projects were required to be cleared, was not prepared and approved, and thus failed to address the fragmented and isolated approach to surface and ground water development. Further, out of 189 projects cleared, 96 projects were granted conditional clearances though no such provision existed in the MWRRA Act, 2005. Scrutiny of

18 projects to which administrative approvals (AAs) were granted by the VIDC revealed that clearance was granted by MWRRA subject to framing of revised policy by WRD to lower the dependability[13] of water to already existing major projects from 75 *per cent* to 50 *per cent* since the new projects were proposed in the catchment area of the existing major projects. However, VIDC granted AA amounting to ₹ 248.95 crore to these 18 projects and incurred an expenditure of ₹ 320.61 crore (March 2013) though the revised policy was not framed by WRD (June 2013).

In the absence of SWRP, integrated planning, development and management of water resources as envisaged in the State Water Policy could not be achieved. Audit also noticed disparity among different regions of the State in the development of Irrigation Potential (IP) as discussed in **paragraph 2.2.1**.

2.2.1 Regional imbalance in the development of IP

Section 21 (1) of the MWRRA Act, 2005 vested the MWRRA with special responsibility for removal of irrigation backlog as per the Governor's directives. The MWRRA was responsible for preparation of Annual Reports wherein the details of the backlog removed in each district every year through creation of irrigation potential were depicted. The IP created by the WRD and local sector (schemes less than 250 ha) were converted to Standard Rabi Equivalent[14] (SRE) in these Reports and compared to the net sown area[15] of 180.62 lakh ha as on June 1994[16]. As per the MWRRA Report for the year 2011-12, the percentage of IP created in the State in June 2011 with reference to the net sown area of June 1994 was 59.03.

The net sown area (NSA), IP created and IP created in SRE in June 1994 and June 2011 region-wise was as shown in **Table 2.1**.

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[13] Major and medium irrigation projects are designed for 75 *per cent* dependability of rainfall in the catchment area, which means that in three out of four years the dam will be filled. At 50 *per cent* dependability, the water availability in the projects upstream would decrease and more storage would be required so that the IP already created is not affected. This is because at 50 *per cent* dependability, the dam will be filled in two years. The Government has however, not framed such a policy

[14] Since the water requirement of a sown area would vary depending on the crop cultivated, soil condition *etc*. the cropped area in each district is converted to Standard Rabi Equivalent (SRE). Conversion factor fixed by Indicators and Backlog Committee is used to calculate the water required for an area having different crops against water required for equivalent area of Jowar crop in Rabi season. The percentage of IP created in terms of SRE in hectares *vis-à-vis* the net sown area for each district as well as for the entire State is then worked out. Districts with created IP less than the percentage of IP created *vis-à-vis* the net sown area in the State were considered as backlog districts and accordingly the physical and financial backlog determined

[15] It is the total area sown with crops. Area sown more than once is counted only once

[16] The Government had accepted backlog removal with respect to the State average of IP creation of 35.11 *per cent* of the net sown area prevailing as on 1 June 1994

Table 2.1: NSA, IP created and IP created in SRE as on June 1994 and June 2011

Region	Net sown area (lakh ha)		IP created by State and local sectors (lakh ha)		IP created in SRE by State and Local sectors (lakh ha)		Percentage of IP created in SRE to net sown area	
	As of June 1994	As of June 2011	As of June 1994	As of June 2011	As of June 1994	As of June 2011	As of June 1994 (Col 6 ÷Col 2)* 100	As of June 2011 (Col 7÷Col 3) *100
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Amravati	31.38	30.76	2.64	5.80	4.16	8.74	13.26	28.41
Aurangabad	47.56	45.28	7.20	14.99	12.94	23.34	27.21	51.55
Konkan	8.78	8.18	0.90	1.65	2.65	4.45	30.18	54.40
Nagpur	19.69	19.02	5.67	8.79	7.47	12.30	37.94	64.67
Nashik	36.58	35.59	8.86	12.21	13.46	20.71	36.80	58.19
Pune	36.63	35.23	12.21	20.37	22.73	37.08	62.05	105.25
	180.62	**174.06**	**37.48**	**63.81**	**63.41**	**106.62**	**35.11**	**61.25**

Source: Data in columns 2 and 7 are from the latest Annual Report of MWRRA for the year 2011-12. Data in column 5 has been taken from the Irrigation Status Report, June 2011 and Report on IP creation under Minor Irrigation (Local Sector), April 2011. Data in column 3 furnished by the Commissioner of Agriculture, Pune. Data in columns 4 and 6 are adopted from the Indicators and Backlog Committee Report of 1997.

Column 8 and 9 of **Table 2.1** show that the percentage of IP created in the State in SRE with reference to the net sown area ranged from 13.26 to 62.05 and 28.41 to 105.25 in June 1994 and June 2011 respectively, showing wide regional imbalances. The percentage of IP created region-wise in SRE to the net sown area in June 1994 was 13.26, 27.21 and 30.18 in Amravati, Aurangabad and Konkan respectively, while it was 62.05 in Pune, indicating wide regional imbalances. The regional imbalance continued to persist as the percentage of IP created in SRE to net sown area of June 2011 was 28.41, 51.55 and 54.40 in Amravati, Aurangabad and Konkan respectively, while it was 105.25 in Pune.

In the Economic Survey Report for the year 2012-13, the Gross Cropped Area (GCA)[17] of the State was given only up to 2010-11. However, information furnished to Audit (January 2014) by the Commissioner of Agriculture, Pune and the Director of Horticulture, Pune showed that during 2011-12 an area of 197.51 lakh ha was under food grains/cash crops and 21.70 lakh ha under horticulture[18] crops. Thus, considering these two elements, the GCA of the State in 2011-12 was estimated at 219.21 lakh ha. Further, since the region-wise details of 21.70 lakh ha under horticulture crops was not available from the Director of Horticulture, for ascertaining the regional imbalance in IP creation by the WRD (including the local sector) as on June 2011 and its impact on cropping pattern, the analysis was restricted to only food grains/cash crops for an area of 197.51 lakh ha, as shown in **Table 2.2** below.

[17] Gross cropped area is the sum of net sown area and the area sown more than once in an agricultural year

[18] The Director of Horticulture, Pune reported (January 2014) a total area of 21.70 lakh ha under horticulture crops for the year 2011-12 in the form of fruits/vegetables *etc.* but did not provide the region-wise/district-wise details

Table 2.2: Comparison of region-wise cropped area of food grains in kharif, rabi, perennial (sugarcane) and hot weather season with IP created as of June 2011

Region	IP created through (in lakh ha)			Cropped area under (in lakh ha)@				
	WRD$ Schemes	Local Sector Schemes#	Total	Kharif	Rabi	Perennial (Sugarcane)	Others (hot weather Season)	Total (5 to 8)
1	2	3	4	5	6	7	8	9
Amravati	4.63	1.17	5.80	33.08	4.60	0.05	0.11	37.84
Aurangabad	10.74	4.25	14.99	44.60	16.36	2.39	0.34	63.69
Konkan	1.07	0.58	1.65	5.08	0.34	0	0.13	5.55
Nagpur	6.32	2.47	8.79	19.17	3.77	0.08	0.21	23.23
Nashik	8.23	3.98	12.21	26.03	8.83	1.79	0.30	36.95
Pune	17.27	3.10	20.37	10.38	13.61	5.91	0.35	30.25
Total	**48.26**	**15.55**	**63.81**	**138.34**	**47.51**	**10.22**	**1.44**	**197.51**

Source: (i) $: Irrigation Status Report of WRD; (ii) #: Data furnished by the Chief Engineer, Minor Irrigation (Local Sector), Pune; (iii) @: Data furnished by the Commissioner of Agriculture, Pune

Crops grown in the Kharif season are dependent mainly on rains while those grown in the rabi season, hot weather and perennial crops are dependent on flow irrigation through canals. **Table 2.2** shows that IP created in Aurangabad, Nashik and Pune regions was more than that created in Amravati, Konkan and Nagpur regions. As a result, in Amravati, Konkan and Nagpur regions agriculture is mainly kharif based while in Aurangabad, Nashik and Pune regions crops are grown in both the seasons.

The Government stated (January 2014) that the cropping pattern is decided by individual farmers depending on tradition and considering agro-climatic conditions. Amravati region is in assured and moderate to high rainfall zone and kharif crops are grown. Konkan region has a very high rainfall zone and have lateritic[19] and non-lateritic soil conditions where paddy and horticulture is mainly taken up. Cotton is an important crop in Vidarbha and Marathwada regions. Therefore, the conclusion drawn by Audit that rabi crops are taken up in Pune, Nashik and Aurangabad regions, while in Konkan and Amravati regions kharif crops are taken up is the impact of regional imbalance, is not correct.

The reply is not tenable because as seen from **Table 2.2** above, the Amravati and Konkan regions, which are in moderate to high rainfall zones, were lagging behind in IP creation. On the other hand, the greater area under rabi crops in Pune, Nashik and Aurangabad regions was a direct outcome of extension of irrigation facilities. Further, as on June 2011, there was a deficit of 6.70[20] *per cent* in removal of physical backlog of IP creation in the Amravati region comprising districts of Akola/Washim, Amravati, Buldhana and Yavatmal. Whereas in the Konkan region, of the four districts (Raigad, Ratnagiri, Sindhudurg and Thane), the physical backlog in creation of IP was removed in two districts of Raigad and Ratnagiri only in 2006 and 2011 respectively.

[19] A red soil produced by rock decay; contains insoluble deposits of ferric and aluminum oxides

[20] Difference between the State average of 35.11 *per cent* (1994) and that created (28.41 *per cent*) as on June 2011 as shown in **Table 2.1** above

2.3 Non-preparation of annual and five year development plans

As per the Acts of the IDCs, annual and five year working development plans were to be prepared to achieve the predetermined objectives. The status of preparation of plans by IDCs is shown in **Table 2.3**.

Table 2.3: Status of preparation of plans by IDCs

Name of IDCs	Whether five year working development plan prepared	Whether Annual Plan prepared	Remarks
MKVDC	No	No	The Government stated (July 2013) that master plan was approved by GoM in October 2001. Audit observed that the master plan did not stipulate any target dates for completion of the projects.
GMIDC	Yes	Yes	The five-year plan of 2007-12 provided to Audit contained total proposed outlay and target of IP creation for the total plan period of identified projects. But did not contain annual targets and no review was carried out for its implementation.
KIDC	Yes	Yes	The five-year plan prepared did not contain any year-wise targets.
VIDC	Yes	Yes	The Government stated (July 2013) that planning was done in 1997-2002, 1999-2007, 2006-09, 2010-2015. However, the annual plans containing targets did not have any link with the three and five year plans.
TIDC	Yes	Yes	The Government stated (July 2013) that five year plan was prepared for the period 2010-2015, prior to that the annual plans were prepared and reviewed at Government level. Audit observed that no review was conducted by the Governing Council (GC) for its implementation. Moreover, the annual plans containing targets did not have any link with the long-term plan.

2.4 Governor's directives for backlog removal not followed

Based on the Presidential Order issued under Article 371 (2) of the Constitution of India, the Honourable Governor of Maharashtra constituted (1994) Development Boards for Vidarbha[21], Marathwada[22] and Rest of Maharashtra[23] to ensure equitable allocation of funds for development of these three regions. As per the initial report (July 1997) of the Indicators and Backlog Committee (IBC) appointed (1995) by the Governor, the percentage of IP created in the State *vis-à-vis* the net sown area was 35.11 *per cent* (31 March 1994) based on which the physical and financial backlog was worked out. The physical backlog was 13.83 lakh ha in SRE which was to be liquidated in five years from 2001-2002 onwards. The financial backlog in irrigation as on 31 March 1994 was ₹ 7,418 crore in the three regions of Vidarbha, Marathwada and Rest of Maharashtra.

Audit scrutiny revealed the following:

- Financial backlog of ₹ 7,418 crore as on March 1994 was recalculated at ₹ 6,618.37 crore on 1 April 2000 after considering the backlog removed during 1994-95 to 1999-2000. In the succeeding years,

[21] Consisting of districts of Wardha, Nagpur, Bhandara, Gondia, Chandrapur, Gadchiroli, Buldhana, Akola, Washim, Amaravati and Yavatmala

[22] Districts of Aurangabad, Jalna, Parbhani, Hingoli, Beed, Nanded, Osmanabad and Latur

[23] Districts of Thane, Raigad, Ratnagiri, Sindhudurg, Nashik, Dhule, Nandurbar, Jalgaon, Ahmednagar, Pune, Satara, Sangli, Solapur and Kolhapur

financial backlog was calculated by deducting the expenditure incurred on backlog removal. As financial backlog was never revised based on the increase in price, physical backlog could not be removed though the total required fund of ₹ 6,618.37 crore was spent by March 2010. The region-wise position of physical and financial backlogs in Vidarbha, Marathwada and Rest of Maharashtra regions during 2007-12 is shown in **Table 2.4**.

Table 2.4: Region-wise position of physical and financial backlog during 2007-11

Region	1 April 2007		1 April 2008		1 April 2009		1 April 2010		1 April 2011		1 April 2012	
	P	F	P	F	P	F	P	F	P	F	P	F
Vidarbha	3.38	2490.09	2.91	1874.19	2.63	788.76	2.55	0	2.40	0	2.34	0
Marathwada	0.54	720.65	0.44	407.76	0.19	159.20	0	0	0	0	0	0
Rest of Maharashtra	0.31	0	0.17	0	0.10	0	0.02	0	0	0	0	0
Total	**4.23**	**3210.74**	**3.52**	**2281.95**	**2.92**	**947.96**	**2.57**	**0**	**2.40**	**0**	**2.34**	**0**

Source: Governor's Directives
Note: **P** : Physical backlog (in lakh ha in SRE); **F**: Financial backlog (in ₹ crore)

As may be seen from above, though the financial backlog was liquidated in all the districts by April 2010, the physical backlog in four[24] districts of Vidarbha region stood at 2.34 lakh ha in SRE even after passage of 13 years from the acceptance of the IBC's recommendation in the year 2000. The Government stated (August 2013) that 102 projects have been taken up in the backlog districts and are planned for completion by 2016-17 involving financial outlay of ₹ 8,034.38 crore. Of this, an expenditure of ₹ 890.82 crore was incurred in 2012-13 and ₹ 346.24 crore up to September 2013.

- The Governor noted mismatch during 2007-08 and 2008-09 between the allocation and the actual expenditure in these three regions, with excess expenditure incurred in rest of Maharashtra region (allocation by the Governor was ₹ 1,530.04 crore against which expenditure was ₹ 3,613.14 crore during 2007-09) while there was significant shortfall in Vidarbha region (allocation by the Governor during 2007-09 was ₹ 4,744.67 crore while expenditure was ₹ 4039.94 crore).
- The Governor directed (2009-10) the Planning Department to investigate the matter, fix responsibility for diversions as well as make recommendations to avoid such situations in future and submit a report. The Governor also noted that if such diversion of funds from one region to another and from backlog district to non-backlog district within the region had not happened, the remaining financial backlog in Vidarbha and Marathwada would have been wiped out. Perusal of the directives for the years 2010-13 (three years) revealed that compliance to Governor's directives for fixing responsibility for diversion of funds was not done. The Government stated (January 2014) that all information regarding release and expenditure had been submitted to the Planning Department for further action in the matter.
- The Governor acknowledged (2009-10) the huge cost of ongoing projects and the limited available resources. The Governor therefore, directed that the Planning Department conduct a detailed study of the cost and time overruns of the ongoing projects in the State and submit a

[24] Akola, Amravati, Buldhana and Washim

report within six months. However, it was noticed that the Government did not submit a report to the Governor. The Government stated (January 2014) that a Sub-Committee has been formed under the Chairmanship of the Executive Director, VIDC to study this issue and the report has been submitted to the Planning Department through WRD with recommendations to avoid such situations in future.

- The Governor also noted that there was no impact assessment study of the efforts to liquidate the irrigation backlog in terms of better returns to the farmers, improved quality of life and inclusive growth. This was imperative to ensure that the efforts under Article 371 (2) of the Constitution of India to take the development initiatives to a logical conclusion. The Governor therefore, directed (2009-10) that the Planning Department should commission an independent impact assessment study and submit a report. The Planning Department allotted (March 2011) the work of conducting impact assessment study to NABARD Consultancy Private Limited. The scope of work as per the agreement *inter alia* included ascertaining the reasons for cost escalation in projects, changes in cropping pattern, issues pertaining to land acquisition, resettlement of project affected persons *etc.* through selection of 12 projects and survey of 360 beneficiaries. The Government stated (January 2014) that the final report from NABARD was awaited.

2.5 Non-prioritisation of projects

A High Power Committee (HPC) headed by the Chief Secretary, recommended (November 2001) prioritization of the irrigation projects to prevent the thin spreading of limited funds among many projects, thereby ensuring completion of projects which were in an advanced stage of completion. The HPC recommended the following:

- No new projects to be taken up;
- Projects on which expenditure incurred was 75 *per cent* or more of the project cost, were to be completed first (category A);
- Projects on which 50 to 75 *per cent* expenditure of the project cost was incurred (category B) in areas with backlog in irrigation were to be taken up next; and
- Projects on which expenditure incurred was less than 50 *per cent* were to be taken to a safe stage and further expenditure stopped (category C).

The erstwhile Irrigation Department (now WRD) accepted the recommendations and accordingly issued instructions (January 2002) for planning and execution of the projects. However, the IDCs continued execution of projects without prioritisation as discussed below:

The summarised position of projects as per the categories specified for prioritisation as on April 2002, expenditure incurred on them *etc.* in respect of two[25] IDCs *viz.* MKVDC and KIDC is shown in **Table 2.5**.

[25] Remaining three IDCs (GMIDC, TIDC and VIDC) did not furnish the information and therefore the analysis regarding priority in execution of the project was not possible

Table 2.5: Projects incomplete due to non-prioritisation

Prioritisation category as per HPC recommendation	Number of projects[26]	Balance cost as on April 2002 (₹in crore)	Expenditure from April 2002 to June 2013 (₹ in crore)	Number of incomplete projects as on June 2013 (percentage to projects as on April 2002)	Cost overrun in respect of incomplete projects ₹ in crore (Number of projects)	Balance cost of incomplete projects as on June 2013 (₹ in crore) (Number of projects)
Category A	25	244.59	1295.76	10 (40)	1061.14 (10)	1061.92 (10)
Category B	27	2529.55	3747.69	17 (63)	1248.04 (16)	3485.75 (17)
Total	**52**	**2774.14**	**5043.45**	**27 (52)**	**2309.18 (26)[27]**	**4547.67 (27)**
Category C	45	7236.73	7687.78	42 (93)	1765.64 (17)	14113.63 (42)
New Projects	**Number of projects**	**Estimated cost**	**Expenditure up to June 2013**	**Projects completed**	**Projects incomplete**	**Cost overrun on projects (June 2013)**
MKVDC	19	61.42	92.45	14	5	40.78[28]
KIDC	17	968.61	900.84	0	17	327.85[29]
Total	**36**	**1030.03**	**993.29**	**14**	**22**	**368.63**

Source: Information furnished by the IDCs

Table 2.5 showed that:

- Twenty seven projects (52 *per cent*) in Category A and Category B could not be completed even as of June 2013;
- An expenditure of ₹ 993.29 crore was incurred on new projects up to June 2013 taken up during 2002-13.
- If the ongoing 45 Category C projects were taken to safe stage and stopped and 36 new Category C projects had not been taken up as per HPC's recommendations, the two IDCs could have utilised ₹ 8,681.07 crore (₹ 7,687.78 crore + ₹ 993.29 crore) to complete all the incomplete projects under Categories A and B.

Further audit scrutiny revealed that in the 34th Meeting (June 2003) of the GC of MKVDC, it was decided to prioritise the projects into five categories as detailed in **Appendix 2.1**. Audit observed that there were 12 major projects and five Lift Irrigation Schemes (LIS) in the first, second and third priority as of March 2002. Of the 17 projects, only one project *i.e.* Bhima-Sina Joint Canal was completed at a cost of ₹ 236.32 crore. Though an expenditure of ₹ 12,032.79 crore was incurred (June 2013), the remaining 16 projects were not complete even after more than 11 years due to paucity of funds and land acquisition problems. Audit observed that the matter was further compounded when the Executive Director (ED) continued to release funds and an expenditure of ₹ 2,579.18 crore was incurred up to June 2013 on 12 other projects falling under the fourth and the fifth priorities. This was in violation of the directives of GC which stipulated postponement of projects placed under fourth and fifth priorities. It was also noticed that two projects[30] on

[26] Excluding minor projects under MKVDC
[27] There was no cost overrun in Bhima-Ujani major irrigation project under MKVDC
[28] Cost overrun only in 17 out of 19 projects
[29] Cost overrun only in eight out of 17 projects as in the remaining nine projects the expenditure was within the original AA
[30] Tembu and Purandar LIS

which expenditure incurred as on March 2002 was less than 50 *per cent* of the total cost, was included in the third priority by the GC in contravention to HPC recommendations and funding continued to these two projects.

The Government in respect of MKVDC stated (October 2013) that the projects under fourth and fifth categories were mainly LISs serving drought prone areas. The reply is incorrect in view of the Governor's directives that specifically ruled out taking up projects in drought prone areas, as all the districts having drought prone area in Rest of Maharashtra (MKVDC) were above the State average of IP created *vis-à-vis* net sown area. The Governor in his directive (2002-03) had also questioned the economic viability of LISs taken up in the drought prone districts of Solapur and Sangli in Rest of Maharashtra (MKVDC).

Besides the HPC recommendation and the Governor's directives, the Maharashtra State Development Report published (November 2005) by the Planning Commission, GoI reported that many of the irrigation projects commenced in different plan periods were not completed in time which resulted in cost overrun besides delaying water supply to farmers. The delays were attributed partly to inadequate allotment of funds required for completing the projects. Therefore, the Report recommended that priority be given to those projects which were nearing completion (over 75 *per cent* construction completed) by allocating the required funds and if required, no new projects be taken up for the next five years or till the completion of all the ongoing projects.

Thus, besides WRD's own knowledge of the incomplete state of many projects there were enough indicators by way of recommendations from the HPC, the Governor's Directives and the Planning Commission stressing the need for proper planning and financial management of irrigation projects. The fact that the balance estimated cost[31] of 601 ongoing irrigation projects (72 major[32], 111 medium and 418 minor) as on 1 June 2013 was ₹ 82,609.64 crore (almost nine times the final capital grant of ₹ 8,588.02 crore allotted to WRD in 2012-13) indicated flawed planning by WRD in management of irrigation projects.

The Government stated (July 2013) that projects were taken up for liquidation of backlog, utilize water allocated by tribunals and for meeting the demands of public representatives and as such, it increased number of ongoing projects and the balance cost. Further, the Governor had permitted new projects to be taken up in Godavari river basin of Vidarbha region to utilize balance available water as per Godavari Tribunal Award due to which, the recommendation of HPC could not be implemented fully. The Government further stated that to protect the share of water allotted as per the first Krishna Water Dispute Tribunal (KWDT) award, work of all planned projects in MKVDC were taken up simultaneously. The Government added that efforts were made to enhance the allocation to the sector through the State sector

[31] Balance funds required for completion of projects
[32] Including 20 Lift irrigation scheme

funds as well as getting higher Central Assistance under AIBP or funding from NABARD and that it was committed to completing last mile[33] projects.

The reply is not acceptable as the Governor's directives (from 2002-03 onwards) were not for allocation to any specific project and hence, funds could have been allocated as per prioritization recommended by HPC. Further, the Governor had recommended every year from 2006-07 to prioritise the funding of projects to avoid the 'spread thin' approach and prevent further cost escalation. Audit also observed that there was no financial backlog in 'Rest of Maharashtra' region as on April 2006 and thus, there was no justification for non-prioritization of the projects executed there. Further, since the KWDT award did not stipulate any time frame for completion of storage creation but only a review of the storage creation after May 2000, the simultaneous execution of projects for only storage without prioritization of the projects did not meet the primary objective of irrigation. Non-prioritisation of projects resulted in financial resources being spread thinly over many projects resulting in most of projects remaining incomplete.

A case in support of poor planning leading to frequent changes in the scope of work and delay in the execution of Vishnupuri project by GMIDC is discussed below.

2.5.1 Improper planning of Vishnupuri major irrigation project

The Godavari Water Dispute Tribunal (GWDT) allocated (1979), 60 TMC[34] of water to Maharashtra State on Godavari river basin of which, 11.4 TMC was reserved for the Vishnupuri project. The Administrative Approval (AA) to Vishnupuri project, which is about 250 km downstream of Jayakwadi dam was initially accorded (May 1979) for ₹ 32.24 crore. The scope of the project as per AA included construction of a barrage, 68 km long canal and 28 pumps for lifting of water from barrage into the canal. Further, four LISs on main canal were also included within the scope of the project in the first RAA accorded in June 1994. The project envisaged gross utilisation of 11 TMC of water to irrigate 28,340 ha Irrigable Command Area (ICA) and 0.4 TMC towards supply of water to Nanded town. The barrage proper under the project was constructed in the year 1989 and part of the main canal, branch canal and distributaries up to 19 km were completed by 2001 and irrigation started from 2001-02. The WRD, thereafter, accorded three Revised Administrative Approvals (RAAs) increasing/ decreasing the scope of the project resulting in delays and increase in the cost of the project proper by ₹ 2,419.76 crore. The details of the various changes made at the time of grant of RAAs and the revised water use are as indicated in **Table 2.6**.

[33] Projects which are in the final stage of completion
[34] TMC: Thousand Million Cubic Feet; One TMC = 28.32 million cubic meters (mcum)

Table 2.6: Table showing AAs and RAAs accorded to Vishnupuri Project

Sr. No.	Particulars	As per original AA (May 1979)	As per first RAA (June 1994)	As per second RAA (March 2005)	As per third RAA (November 2005)	As per the fourth RAA (August 2009)	As per Revised water use (October 2010)
Phase I - Vishnupuri Original Project							
1	Water use of the project in TMC	11.4	11.4	4.1	4.1	8.08	5.83
2	Rising Main (RM)	6 RM with diameter of 1,600 mm		3 RM with diameter of 1,600 mm		6 RM with diameter of 1,600 mm	3 RM with diameter of 1,600 mm
3	Pumps (Capacity: 850 horse power)	28 pumps	28 pumps	14 pumps	14 pumps	24 pumps	14 pumps
4	Length of the canals	68 km	65 km	49 km	49 km	68 km	49 km
5	Lift irrigation on canal	-	4*	1$	3#	4*	4*
	* Shiradhon, Derla, Kiwala and Kolambi; $:Shiradhon; and # Shiradhon, Derla, Kiwala						
6	Projected IP to be created	28,340 ha	28,340 ha	19,514 ha	24,076 ha	28,340 ha	28,340 ha
7	Cost (₹ in crore)	32.24	196.60	225.10	261.16	579.59	
	IP created						17,080 ha
8	Expenditure (₹ in crore)					307.56	
9	Physical status of work: Construction of barrage, pump house building (for installing 28 pumps) was complete. Main canal up to 49 km and branch canal/distributaries were completed in 2009. The work of minors and field channel was in progress. The Head works of Shiradhon and Derla LIS were completed while in Kiwali LIS the work was not started. The headwork of Kolambi LIS and the distribution network of all the four LIS was in progress (October 2013).						
Phase II - Vishnupuri Barrages							
10	Projected IP to be created (No. of barrages)			23,247 ha (10 barrages)	22,823 ha (11 barrages)	23,446 ha (12 barrages)[35]	26,523 ha (13 barrages)
11	IP created (utilised)	23,598 ha (8794 ha)					
12	Water use of the barrages in TMC	-	-	6.40	6.41	3.32	6.55
13	Cost (₹ in crore)			375.84	750.61	1,872.41	
14	Expenditure (₹ in crore)					1,527.07	
15	Physical status of work: 11 barrages completed between 2009-11, out of 12 barrages[36] taken up for construction						
Source: Information furnished by GMIDC							

As will be noticed from the table above, the water use of the original project (Phase I) was kept at 11.4 TMC up to the first RAA, reduced to 4.1 TMC in the second and third RAA to accommodate the barrages in Phase II of the project, increased to 8.08 TMC in the fourth RAA and finally decreased to 5.83 TMC. Simultaneously, water use for the barrages (Phase II) also varied from 6.40 TMC in second and third RAA, to 3.32 TMC in fourth RAA and increased to 6.55 TMC in the revised water plan in October 2010.

In this regard Audit observed that:

[35] Through drip irrigation only

[36] Nanded- one barrage, Parbhani – five barrages, Jalna - four barrages and Aurangabad - two barrages

- There had been inconsistencies in framing the scope of the project, the projected IP to be created and water allocation as evident from **Table 2.6**.
- As against the envisaged utilisation of 11.4 TMC of water under Phase I of the project, the storage capacity created was only 2.96 TMC through one barrage constructed in 1989, with an optimum use up to 4.1 TMC (considering water use in monsoon and post-monsoon through regeneration flow). In order to recoup the deficit of 7.3 TMC of water (11.4 TMC – 4.1 TMC) allotted in Phase I, GMIDC accorded three RAAs between March 2005 and August 2009 under Phase II for construction of 11 more barrages upstream of the project and one barrage downstream of the project. Further, in the Water Plan approved by the GoM (October 2010), one more barrage downstream of the project was included to create an overall IP of 26,523 ha under Phase II. Thus, taking up the construction of 13 barrages within a span of five years clearly indicated poor planning for the project. The Government stated (January 2014) that 7.3 TMC of water was flowing to another State located downstream of the project, without utilisation. Therefore, Maharashtra could not use allocated water fully awarded as per GWDT. It further stated that due to limitations of storage capacity of the Vishnupuri project, it was not possible to use allocated water fully. Therefore, there was no other way but to construct additional barrages on Godavari river for optimum utilisation of water.

  The reply is not tenable as even after revising the Water Plan five times from the AA of May 1979 to the latest Water Plan of October 2010, there was still a shortfall of 4.63 TMC in storage creation for command area of the project located in Nanded district (downstream of Phase I). Therefore, the Government's contention that additional barrages were built to tap the water flowing down to the neighbouring State is not correct as the envisaged objective of creating irrigation facilities to irrigate 28,340 ha through water use of 11.4 TMC was not met.
- Eleven out of 13 barrages planned and approved upstream of the project were overlapping the command area of Jayakwadi major project, which in effect led to transferring of water use of 5.81 TMC[37] (out of total allocation of 11.4 TMC) from the command area of Vishnupuri project to Jayakwadi project. The Government stated (January 2014) that though most of the sites of barrages are on upstream of Vishnupuri project, the barrages were proposed to utilise allocated water use of Vishnupuri Project. Hence, this was taken as Phase II of Vishnupuri project as decided in a meeting of Principal Secretary level officers at Mantralaya. The reply does not address the issue of transfer of water from Vishnupuri to Jayakwadi command area.
- The water use approved in fourth RAA was revised again in October 2010 for Phase I and Phase II of the project and accordingly 12.38 TMC of water (5.83 TMC in Phase I and 6.55 TMC in Phase II) was approved as against original allocation of 11.4 TMC.

[37] 6.55 TMC of water was allocated for 13 barrages under Phase II as shown in **Table 2.6** less water allocation of 0.74 TMC for two downstream barrages

- Out of total IP of 23,446 ha to be created in Phase II of the project through 12 barrages, no IP creation was envisaged in the district having highest backlog *i.e.* Hingoli, which falls within the Godavari river basin.

  The Government stated (January 2014) that Hingoli district was in Purna and Penganga sub-basins and that Godavari river is far away from Hingoli district. Hence, water from Godavari river cannot be transferred to Hingoli district. As regards backlog, the Government stated that Indicators and Backlog Committee (IBC) assessed backlog (1994) for 30 districts existing in the State at that time and the new districts *viz.* Gondia, Hingoli, Nandurbar and Washim were formed at a later date. Hingoli was initially part of Parbhani district which did not have backlog.

  As per the Report[38] of the GWDT (Volume I), both Purna and Penganga sub-basins are part of the Godavari basin therefore, the Government's contention is not correct. Further, the reply that IBC recommendations were applicable only to the undivided Parbhani district is also not correct because the MWRRA Annual Reports from 2006-07 to 2009-10 [39] clearly indicates that Hingoli district had a persistent physical backlog in IP creation ranging from 7.4 *per cent* to 5.58 *per cent*.
- Environmental clearance for construction of 13 barrages under Phase II with an envisaged IP creation of 26,523 ha was not obtained from the Ministry of Environment and Forest. The Government stated (January 2014) that the project was approved in May 1979 and clearance accorded by Central Water Commission in June 1983 for utilisation of 11.4 TMC of water and that the barrages were an integral part of the Vishnupuri project. The Environment Impact Assessment (EIA) notification came into force from 1994 and Vishnupuri was sanctioned prior to 1994 hence, the EIA notification was not applicable. The reply is not tenable as the additional barrages were approved in March 2005 as indicated in **Table 2.6** above. Further, as per the EIA notification of 1994 and its subsequent amendments up to 2002, the expansion and modernisation of irrigation projects with additional command area of more than 10,000 ha required environmental clearance from the Central Government.
- Work on Phase II of Vishnupuri project commenced even before completion of Phase I, where the IP created was only 17,080 ha as of October 2013, against 28,340 ha envisaged. Taking up of Phase II works without completing envisaged targets of phase I was also a reflection of poor planning.

Thus, improper planning at various stages delayed the completion of the project, with consequent increase in cost of the entire project (Phase I and Phase II) by ₹ 2,419.76 crore. Further, construction of barrages in non-backlog districts widened the disparity in IP creation.

2.6 Financial management

The construction of irrigation projects are funded through GoM's own funds, funds received from GoI for three Central Schemes namely, Accelerated

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[38] Prepared in 1979

[39] Separate data on physical backlog on Hingoli district from 2010-11 onwards was not reflected in MWRRA Reports

Irrigation Benefit Programme (AIBP), Repair, Renovation and Restoration (RRR) of water bodies, Command Area Development and Water Management programme (CADWM), financial assistance from NABARD, loans from World Bank through Maharashtra Water Sector Improvement Project (MWSIP) and water charges collected from water users. The percentage of capital expenditure of WRD with reference to total capital expenditure of GoM decreased from 61.26 in 2007-08 to 42.25 in 2012-13. The budget provision and expenditure of WRD[40] for the last six years appears in **Table 2.7**.

Table 2.7: Budget provision and actual expenditure (Revenue and Capital Expenditure) during 2007-13 **(₹ in crore)**

Year	Final Modified Grant		Actual Expenditure		Savings		Percentage of Saving compared to Final Modified Grant	
	Revenue	Capital	Revenue	Capital	Revenue	Capital	Revenue	Capital
2007-08	2638.85	7088.82	2228.10	7038.84	410.75	49.98	15.56	0.70
2008-09	2062.99	11386.79	2048.31	11370.33	14.68	16.46	0.71	0.14
2009-10	2451.04	9279.95	2270.48	8246.90	180.56	1033.05	7.36	11.13
2010-11	2538.96	9569.62	2295.95	9237.68	243.01	331.94	9.57	3.46
2011-12	2717.67	9049.41	2450.02	8236.27	267.65	813.14	9.84	8.98
2012-13	2626.17	8588.02	2240.55	7350.63	385.62	1237.39	14.66	14.41
Total					**1502.27**	**3481.96**		

Source : Appropriation Accounts

Audit observed the following:

- The Maharashtra Budget Manual, Para No. 173 envisages that all savings anticipated by the Controlling Officers should be reported with full details and reasons to the administrative departments concerned unless they were required to meet the anticipated requirement for additional funds under some other budget heads within the total allotment under the same grant/appropriation placed under their control. Scrutiny of the Appropriation Accounts revealed that WRD surrendered a total amount of ₹ 5,153.67 crore[41] during the period 2007-13. The Government stated (February 2013) that the surrenders occurred as the Finance Department did not release the funds to the Department.

2.6.1 Short release of funds by GoM to IDCs

The IDCs receive entire funding from GoM in the form of grants for execution of works and for meeting their revenue expenditure. The position of funds demanded by IDCs and funds received from various sources and expenditure incurred during 2007-13 was as detailed in **Table 2.8**.

[40] Excluding grant no I- 6 (Internal debt of State Government and I -7 (Loans to Government servant *etc.*)

[41] 2007-08: ₹ 559.47 crore; 2008-09: ₹ 74.11 crore; 2009-10; ₹ 1,218.87 crore; 2010-11: ₹ 576.84 crore; 2011-12: ₹ 1,099.05 crore; and 2012-13: ₹ 1,625.33 crore related to I-1 to I-5 grants

Table 2.8: Funds demanded *vis-à-vis* received for works during 2007-13 (₹ in crore)

Name of the IDC	Total demand including salary	Total receipts	Shortfall	Total expenditure
MKVDC	13534.00	7717.95	5816.05	6802.26
GMIDC	12548.10	8382.86	4165.24	8793.04
VIDC	22537.06	18346.60	4190.46	16423.85
KIDC	5242.45	3378.44	1864.01	3314.27
TIDC	2874.92	3547.66	(-) 672.74	3361.47
Total	**56736.53**	**41373.51**	**16035.76**	**38694.89**
Source: Information furnished by the IDCs				

While WRD surrendered funds amounting to ₹ 5,153.67 crore during 2007-13, there was short-release of funds to IDCs to the extent of ₹ 16,035.76 crore. The IDCs however, failed to fully utilise the funds released to them.

Thus, while short-release of funds by GoM necessitated prioritization of projects and avoid thin spreading of resources among many projects, this was incidentally not done, as already discussed in **paragraph 2.5**.

2.6.2 Funding of projects through GoI and bank

2.6.2.1 Implementation of Accelerated Irrigation Benefit Programme funded by GoI

The Accelerated Irrigation Benefit Programme (AIBP) was conceived in the year 1996 by the GoI in order to provide financial assistance to States to complete various ongoing projects so that envisaged irrigation potential of the project could be created and thereby extend irrigation to more areas.

During 1996-2012, 252 projects were taken up under AIBP of which, 138 projects (38 major medium and 100 minor) were completed. At the end of March 2012, there were 114 ongoing projects (28 major and medium, 86 minor). An expenditure of ₹ 10,767.58 crore was incurred on 28 major and medium projects. Information on expenditure incurred in respect of 186 minor projects was not made available by the WRD despite repeated requests. Of the 28 ongoing major and medium projects, Waghur major project under TIDC sanctioned in 1996-97 with period of completion of four years was not completed even as on December 2013.

Audit scrutiny of projects under KIDC revealed that as against the fund requirements of ₹ 1,272.53 crore for five[42] projects up to 2011-12, GoM made budget provision of only ₹ 998.34 crore up to 2011-12. Thus, there was short-provision to the extent of ₹ 274.19 crore. Further, against the budget provision of ₹ 998.34 crore, an amount of ₹ 892.39 crore was released by GoI to GoM at the rate of 90 *per cent* of the provisions made. However, as the details of utilisation to the extent of 70 *per cent* of the first installment were not furnished to GoI, balance 10 *per cent* of the Central Assistance was not released by GoI. GoM also did not release 10 *per cent* of its share. Thus, the total short-release of funds to these projects was ₹ 380.14 crore due to short-provision (₹ 274.19 crore) in the budget by GoM and the non-release of

[42] (i) Arjuna: original date of completion – 1998; (ii) Gadnadi: original date of completion – 2000; (iii) Nardave: original date of completion – 1994; (iv) Tillari: Original date of completion –1989; and (v) Aruna: original date of completion – 2000

balance 10 *per cent* (₹ 105.95 crore) of the funds by GoI. The short-release had adverse impact on the progress of the projects as none of the five projects could be completed as of December 2013. Though, GoI agreed to extend the period of completion of these projects, the short-release defeated the objective of accelerating the completion of projects, which envisaged an IP creation of 44,945 ha. The IP created was only 10,681 ha (23.76 *per cent*) as of June 2011 thus, depriving the benefits of the projects despite a lapse of 17 to 33 years from the date of grant of original AAs and after incurring an expenditure of ₹ 2,282.68 crore.

2.6.3 Projects funded by NABARD

NABARD provides loan under the Rural Infrastructure Development Fund (RIDF) for execution of various minor irrigation projects. As per the records of WRD, financial assistance aggregating ₹ 1,824.91 crore in respect of 440 minor irrigation projects was received from NABARD during 2007-08 to 2012-13.

Audit scrutiny revealed that of the 440 projects, 18 projects were subsequently deleted and 278[43] projects were completed up to March 2013. Of the remaining 144 projects, 71 projects were scheduled to be completed by March 2015. In the remaining 73 projects scheduled for completion between March 2003 and March 2013, nine projects were delayed due to paucity of funds, 21 projects were pending RAAs, 15 projects were pending land acquisition, nine projects were delayed due to farmers' opposition, two projects were pending rehabilitation of project affected persons, three projects were pending due to other reasons and the reasons for non-completion of the balance 14 projects were not available on record.

[43] Out of 278 projects, in 189 projects there were delays ranging between one and 10 years

Chapter 3

Project Execution and Contract Management

Chapter 3

Project Execution and Contract Management

3.1 Project Execution

Economic, efficient and effective management of irrigation projects involves proper planning in selection of projects, conducting detailed survey, ensuring timely availability of land, obtaining environmental clearances and administrative and technical approvals, identifying the risk areas *etc.*

The details of number of on-going projects handed over to IDCs since their inception, projects taken up thereafter, projects completed and ongoing projects as of June 2013 are given in **Table 3.1**.

Table 3.1: IDC-wise status of completed and ongoing irrigation projects

IDC	Number of ongoing projects handed over on formation of IDC	Number of new projects taken up	Total projects	Completed (June 2013)	Number of projects ongoing as on June 2013
MKVDC	186	321	507	413	94
GMIDC	199	285	484	356	128
VIDC	10	310	320	63	257
KIDC	38	70	108	29	64[44]
TIDC	95	99	194	136	58
Total	**528**	**1085**	**1613**	**997**	**601**
Source: Figures furnished by the IDCs.					

As on 1 June 2013, the balance estimated projected cost for completion of 601 ongoing projects was ₹ 82,609.64 crore.

Storage of water is an important objective of irrigation projects. IDC-wise position of water storage is given in **Table 3.2**.

Table 3.2: IDC-wise target and achievement of storage as of June 2013 (in TMC)

Name of IDC	Targeted storage of IDC	Storage achieved (June 2013)
MKVDC	175.00	160.86
GMIDC	86.58	75.57
VIDC	314.05	101.60
TIDC	81.67	44.10
Total	**657.30**	**382.13**
Source: Information furnished by the IDCs. **Note**: There was no storage target for KIDC		

As against the targeted storage of 657.30 TMC, the storage achieved till June 2013 was 382.13 TMC *i.e.* 58.14 *per cent*. The IP envisaged to be created out of the total projects handed over by GoM and projects taken up by the IDCs was 60.65 lakh ha out of which the IP created was 32.44 lakh ha (**Appendix 5.1**). In the 87 test-checked projects, as against the IP of 9.90 lakh ha projected, the IP created as on June 2013 was 4.37 lakh ha in 65 projects while no IP was created in 22 projects **(Appendix 3.1)**.

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[44] Excluding Tilher minor irrigation project (under KIDC), which was transferred to Local Body. Further, 14 projects were not taken up (June 2013) by KIDC

Audit noticed various deficiencies in project execution such as improper survey, non-obtaining of environmental clearance, commencement of work without acquisition of land, irregular grant of administrative and revised administrative approvals to works, cost and time overruns, inadequacies in preparation of estimates and deficiencies in contract management, as discussed in the succeeding paragraphs.

3.2 Non-obtaining of environment and forest clearances

3.2.1 Environmental clearance

As per the Environment Impact Assessment (EIA) notification issued (1994) by the Ministry of Environment and Forest (MoEF), GoI under Section 3 of Environment (Protection) Act, 1986 environmental clearance (EC) from the MoEF, was required for all irrigation projects having project cost of ₹ 50 crore and above. Further, as per subsequent amendments[45], expansion and modernization of irrigation projects also required EC, except where the additional command area was less than 10,000 ha or the project cost was less than ₹ 100 crore. In September 2006 the EIA notification issued by the MoEF made it mandatory for all River Valley Projects to obtain prior EC and the process was also decentralised. Projects with Culturable Command Area (CCA) equal to or more than 10,000 ha were to be appraised by MoEF while projects with CCA less than 10,000 ha were to be appraised by State Environment Impact Assessment Authority (SEIAA) on the recommendations of State Expert Appraisal Committee (SEAC). Audit observed the following:

- The SEIAA and SEAC were constituted by GoM only in April 2008 *i.e.* 18 months after the EIA notification of September 2006. Five projects (three medium and two minor) initially valued at ₹ 2.29 crore with IP less than 10,000 ha submitted in the intervening period did not receive any EC either from the Central authority or from the State authority thereafter.
- The responsibility for monitoring the compliance to the conditions made in ECs was left to the project authorities and there was no internal control mechanism in the Department to ensure compliance. Audit noticed non-compliance to conditions stipulated in the EC as regards Catchment Area Treatment Plan, rehabilitation of Project Affected Persons (PAPs) *etc.* in six out of 87 test-checked projects *viz.* Tarali irrigation project, Urmudi irrigation project and Tembu LIS (MKVDC), Waghur and Punad projects (TIDC) and Upper Wardha project (VIDC) (**Appendix 3.2; Sr. No. II**).
- Scrutiny of the consolidated report for the quarter ending March 2013 furnished by CE, Nagpur to GoM revealed that out of 350 projects requiring EC, EC was obtained only for 51 (14.57 *per cent*) projects. In 25 out of the 87 test-checked projects EC was not obtained by the project authorities **(Appendix 3.1)**. A few test-checked cases are discussed in **Appendix 3.2** (**Sr. No. I refers**). It was further observed that in 22 projects where Administrative Approvals (AAs) were granted (2009) by VIDC, an expenditure of ₹ 376.96 crore (75 *per cent* of the estimated cost) was incurred up to March 2013 without obtaining EC.

[45] Amended eight times during May 1994 to June 2002

3.2.2 Forest clearance

As per the Forest Conservation Act, 1980 (Forest Act) prior approval of GoI for use of forest land for non-forest purposes was mandatory. The Forest Act also stipulated that if the proposed work involves forest as well as non-forest land, work should not commence on non-forest land until the approval of GoI for release of forest land was received.

Scrutiny of records revealed that 188 projects valuing ₹ 46,652.44 crore under the jurisdiction of five IDCs remained incomplete (June 2013) because of pending forest clearances by GoI and GoM since February 2002. Of the 188 incomplete projects, AA in respect of 29 projects had lapsed[46], two cases were *sub-judice* while 18 projects were not granted forest clearance due to violation of Forest Act, change in plan of dam *etc*. Forest clearances in respect of the remaining 139 projects were under process at various levels as detailed in **Table 3.3**.

Table 3.3: IDC-wise details of projects pending at various levels for forest clearance

Projects pending with	MKVDC	GMIDC	VIDC	KIDC	TIDC	Total No. of projects
GoI	1	1	9	0	0	11
GoM	0	0	2	0	0	2
Forest Department	9	6	13	12	2	42
Revenue Department	3	3	10	2	1	19
IDCs	5	5	39	11	5	65
Total	**18**	**15**	**73**	**25**	**8**	**139**
Source: Data furnished by the Department						

An expenditure of ₹ 7,129.76 crore was incurred on 89 projects[47] out of the 139 projects pending clearances under the Forest Act and thus, in violation of laid down norms.

IDC-wise details of forest land required, amount of Net Present Value (NPV)[48] payable for diversion of forest land for non-forest purpose are given in **Table 3.4**.

Table 3.4: Forest land required *vis-à-vis* NPV paid and payable (June 2013)

IDCs	Number of Projects	Forest land required (in ha)	Forest Land for which NPV deposited (in ha)	NPV deposited (₹ in crore)	NPV outstanding (₹ in crore)	Forest land against which no NPV was deposited	
						Projects	Area in ha
MKVDC	18	1339.54	569.59	23.70	49.85	2	769.95
GMIDC	15	605.62	456.59	9.38	0.54	5	149.03
VIDC	73	9197.27	5309.20	422.98	179.87	44	3888.07
KIDC	25	6303.22	5381.98	333.02	411.86	5	921.24
TIDC	8	2043.80	135.91	3.60	19.27	5	1907.89
Total	**139**	**19489.45**	**11853.27**	**792.68**	**661.39**	**61**	**7636.18**
Source: Information furnished by the Department							

[46] As per Para 262 of MPW Manual, the AA of a work would ordinarily cease to operate after a period of five years from the date of according AA

[47] Details of remaining 50 projects were not available

[48] The discounted sum of ecosystem goods and services that would flow from a forest over a period of time net of costs incurred. In the context of diversion of forest land to non-forestry NPV means that the loss of value of the forest resources to the stakeholders or the users at the time of diversion of forest land

As seen from **Table 3.4** above, in 61 out of 139 projects no NPV and allied charges[49] were paid to GoI while in the remaining 78 projects the NPV and allied charges outstanding for payment was ₹ 661.39 crore. In two test-checked projects under KIDC, increased levy of NPV and allied charges amounting to ₹ 32 crore was noticed due to delay in payment by the WRD. The details are indicated in **Appendix 3.3**.

Audit also noticed that in 19[50] out of 89 projects mentioned above, commencement of works without forest clearances necessitated changes in alignment, stoppage of works *etc.* resulting in blocking of funds to the extent of ₹ 1,944.92 crore (March 2013). In nine out of 87 test-checked projects forest clearance was pending from GoI, as on June 2013 **(Appendix 3.1)**. A few cases are given in **Table 3.5**.

Table 3.5: Projects taken up without forest clearance

IDC (Project)	Audit observations
MKVDC (Chillewadi medium irrigation project)	The work[51] of the dam was completed in 2003-04 but only partial storage of water (0.61 TMC against full storage capacity of 27.17 TMC) has been achieved. Full storage could not be achieved due to non-payment of NPV of ₹ 10.33 crore for acquiring forest land. Further, due to opposition from the local people, the contractor could not undertake the construction of canals. The contractor expressed (August 2001 and June 2002) unwillingness to execute the work in view of agitation by PAPs. The contract was foreclosed (April 2005) and ₹ 104.29 crore was paid (April 2012) to the contractor including price escalation of ₹ 10.90 crore. MKVDC belatedly resolved (May 2007) to construct closed pipelines instead of open canals. Thus, non-acquisition of forest land and delay in resolving the PAPs issues resulted in non-utilisation of dam constructed at a cost of ₹ 104.29 crore. The Government stated (July 2013) that an agency for executing the work was finalised and work was about to commence.
VIDC (Nimgaon minor irrigation project)	After incurring an expenditure of ₹ 1.07 crore on head works of the dam, the work was stopped in 1998 as it was started on forest land without obtaining forest clearance. The proposal submitted (March 2002) by GoM for diversion of 141.62 ha of forest land was rejected (June 2002) by MoEF as the proposal involved cutting of large number of trees and the command area *vis-à-vis* the forest land required was less. Though GoI accorded clearance (August 2006) for diversion of forest land subject to the condition that no work should be carried out until grant of final clearance, seven work orders were issued (2008-10) and an expenditure of ₹ 37.25 lakh was incurred. The GoI sought (June 2009) an explanation for starting the work without obtaining its final approval. The Government stated (July 2013) that the final clearance to the proposal was under progress.
KIDC (Surya major irrigation project)	The dam with a storage capacity of 286.31 mcum was completed in 1991, but payment of ₹ 85 crore for forest land to GoI was made only in July 2009. The GoI claimed (April 2009) further amount of ₹ 16.22 crore on account of compensatory afforestation and penal compensatory afforestation which was not paid (July 2013). Though the dam work was completed in 1991, only 58 *per cent* of the dam capacity was used up to July 2009 as clearance of Forest Department for forest land in submergence area was not received. After July 2009, full storage was done despite pending final forest clearance. The Government stated (July 2013) that the amount payable to GoI was huge and could not be made available to the project in a non-backlog district due to constraint of Governor's directives to accord priority to release funds only to backlog districts. As the work of dam was completed in 1991, the payment for the forest land should have been made earlier. Moreover, the Governor's directive did not stop allocation for non-backlog areas and hence the Department should have prioritised payment for forest land as the dam was already constructed.

[49] Charges towards alternate afforestation, Catchment Area Treatment plan *etc*

[50] (1) GMIDC: ₹ 12.29 crore (one project); (2) KIDC: ₹ 437.06 crore (one project); and (3) VIDC: ₹ 1,495.57 crore (17 projects)

[51] Turnkey contract including its design was awarded to M/s F.A. Master and Associates, Mumbai at a cost of ₹ 102 crore and work was to be completed by November 2000

3.2.3 Commencement of works without acquisition of land

According to Para 251 of MPW Manual, no work should commence on land which has not been duly made over by the responsible Civil Officer. Land is required for construction of irrigation projects and for rehabilitation of PAPs. Further, as per instructions issued (September 2004) by Revenue and Forest Department, irrigation projects should not be taken up unless rehabilitation of PAPs is completed. Audit scrutiny revealed that in 37 out of the 87 test-checked projects involving an expenditure of ₹ 9,078.58 crore, complete land[52] was not acquired before commencement of works **(Appendix 3.1)**. A few cases in respect of three IDCs (MKVDC, KIDC and GMIDC) are discussed in **Table 3.6**.

Table 3.6: Commencement of works without acquiring land or rehabilitating the PAPs

Project	Audit observations
MKVDC	
Tarli major irrigation project	Due to opposition from PAPs, alignment of Koparde canal was changed (March 2012) from open canal and siphon pipeline to tunnel work and closed pipeline. Approval for incurring additional expenditure of ₹ 154.44 crore was accorded (April 2012) by the CE (Special Project), Pune due to construction of tunnels. An expenditure of ₹ 7.51 crore was incurred as of June 2013. The Government stated (July 2013) that due to opposition from land owners some part of the canal work had to be converted into tunnel work.
Uttarmand medium irrigation project	Though the dam work was physically completed in June 2010, water up to 16.65 mcum could be stored up to the base of the gates against the full storage capacity of 24.59 mcum due to protest by PAPs in the submergence area. As a result, execution of dam work was hampered (1997-2001) and MKVDC had to pay (December 2004) ₹ 5.17 crore towards idle charges for machinery and labour to the contractor. An expenditure of ₹ 107.79 crore was incurred on the project till June 2013. Thus, the inability of WRD to resolve the issues of resettlement of PAPs despite a lapse of more than 15 years from issue of work order in 1997 resulted in under utilisation of storage capacity by 7.94 mcum. The Government stated (July 2013) that the rehabilitation of four of the six villages was completed and the rehabilitation of the remaining two villages was pending due to court cases.
KIDC	
Kondhane minor irrigation project	The land required for the project based on increased height of the dam was 431.80 ha (private land: 132.95 ha, forest land: 298.85 ha.). The first proposal for acquisition of 65.25 ha of private land was forwarded to the Collector's office in October 2011. The Collector returned the proposal in January 2012 with a demand of 25 *per cent* of the cost of proposed land to be acquired which was pending payment (July 2013).
Talere minor irrigation project	The work for construction of dam was awarded in February 2000 with completion period of three years. Due to non- acquisition of land, dam work started only in March 2005 but stopped in November 2010 due to opposition from PAPs as the rehabilitation work was still pending. The gorge filling[53] work was completed in May 2010 but the work of head regulator was still pending and water was not stored due to non-acquisition of entire land for submergence area. The canal work of the project had not started (November 2013). The land required for the project from the private parties was 102.13 ha (72.13 ha for dam, 30 ha for canal) out of which, 69.86 ha for dam area was acquired up to July 2013. Audit scrutiny revealed that the proposal for acquisition of 30 ha of land for canal area was not submitted to Deputy Collector (Land Acquisition), Sindhudurg till July 2013. The Government stated (July 2013) that acquisition of land and rehabilitation of PAPs was in progress.

[52] Civil land and forest land
[53] Filling the river portion of dam embankment

Shirsadi minor irrigation project	As against the total land requirement of 38.10 ha for the canals, notification under Land Acquisition Act, 1984 was issued only in respect of 1.53 ha due to the discrepancies in the land records maintained by the Revenue Authority. The poor progress in land acquisition for canal work resulted in non-completion of the project and non-creation of projected IP of 541 ha due to be created.
Korle-Satandi medium irrigation project	The construction work of the dam was completed to the extent of 99 *per cent* and the gorge filling was done in 2008-09. However, KIDC was unable to store water due to non-acquisition of land for the submergence area. Audit noticed that the proposal for acquisition of land for submergence area of 4.90 ha was submitted by the Division only in 2010. Thus, even after incurring an expenditure of ₹ 114.54 crore up to June 2013, the basic objective of creation of storage was not achieved. KIDC also paid (July 2010) ₹ 7.42 crore to the contractor towards idle machinery. The Government stated (July 2013) that land acquisition proposals for the submergence area were being pursued with Revenue Authority.
Otav minor irrigation project	AA for the project was granted for ₹ 29 lakh in October 1977. The Project was envisaged to be constructed on a local nalla near Otav village with the aim of irrigating 307 ha in Kankavali taluka of Sindhudurg district. KIDC decided (March 2006) to increase the height of the dam from 133.75 meters to 138 meters with resultant increase in storage capacity from 4.80 mcum to 7.718 mcum and increase in the IP creation from 307 ha to 518 ha. Consequently, the requirement of land to be acquired increased from 90.46 ha to 122.83 ha. Out of 122.83 ha of private land to be acquired, 74.01 ha of land was acquired by 1983 while balance land of 48.82 ha was yet to be acquired (July 2013). As a result, only 62.19 *per cent* of projected storage (7.718 mcum) could be achieved in the dam completed in 2009-10 and the canals remained unconstructed. This resulted in non-completion of project and non-achievement of IP creation despite an expenditure of ₹ 31.01 crore incurred as of June 2013. The Government stated (July 2013) that proposals for 45.89 ha had been submitted to Revenue Authorities while proposals for remaining land would be submitted shortly.
Nardave medium irrigation project	The work order for the project (₹ 158 crore) was issued in May 1999 but the actual work started in February 2001 due to opposition from PAPs. In five villages, 967 families comprising 3,849 persons were affected by the project. However, even after a lapse of 14 years of the commencement of work, none of the families have been rehabilitated (June 2013). The PAPs had also stopped the work on several occasions. KIDC paid idle charges (₹ 7.43 crore) to the contractor (November 2012). The Government stated (July 2013) that 80 *per cent* of the rehabilitation work has been completed and efforts were being made to complete the remaining work early.
GMIDC	
Lower Dudhna major irrigation project	The dam work was initially started in 1983 (AA: ₹ 28.42 crore) but due to strong opposition from PAPs the work could not continue. The work resumed in 1994 but was delayed due to problems in rehabilitation of PAPs. Though the dam work has been completed up to 99.50 *per cent* and 57 *per cent* of the work of the RBC and 94 *per cent* of earthwork in the LBC were completed (expenditure incurred ₹ 1,141.95 crore up to June 2013), the works could not be completed due to land acquisition problem and obstruction by local people. Further, the case of rehabilitation of one village was pending in the High Court Bench at Aurangabad. The Government stated (July 2013) that due to opposition from PAPs and litigation the works could not be completed.

3.2.4 Improper survey leading to changes in original design

Scrutiny in audit revealed that estimates were prepared without proper survey of dam sites leading to changes in the original design after issue of work orders such as construction of spillway, tail channel and head regulator, construction of new canals distributaries in place of KT weirs[54], change in canal alignment, increase or decrease in dam height, tunnels or piped water in place of open canals and *vice versa*, shifting of masonry/earthen dam *etc*. In 15 out of 87 test-checked cases, improper survey led to changes in the original design and increased the project cost by ₹ 209.79 crore (**Appendix 3.4).** A few cases by way of illustration are discussed below:

MKVDC

- After issuing the work order (June 2000) at a cost of ₹ 7.45 crore for Urmodi RBC it was noticed that the initial alignment of the RBC was passing close to village Parali. As a result, the local land owners and farmers opposed the construction of the canal. Hence, the origin of RBC was shifted and construction of aqueduct on Urmodi river at Bhondavade was included as an extra item. This led to increase in cost of work by ₹ 10.02 crore against which an expenditure of ₹ 5.13 crore has been incurred (June 2013). The work was still in progress. The Government stated (October 2013) that change in alignment was economical and there was no loss to the command area. The fact remained that improper survey resulted in increase in cost of project.
- The initial estimates in respect of Dudhganga LBC were prepared for tunnel work in some stretches (at 56, 58 and 59 kms). During execution of work, hard rock was found at different chainages, which was unsuitable for tunnelling work. Hence, open canal work was undertaken in these stretches, resulting in additional charges[55] for depositing the extra excavated material and transporting the same at a cost of ₹ 1.08 crore. In another stretch, extra provision of quantities of rock bolt[56] in tunnel portion had to be made resulting in increase in cost by ₹ 1.64 crore. The Government stated (July 2013) that additional expenditure was incurred as per site requirement and after obtaining approval from the competent authority.

KIDC

- Birwadi Lift Irrigation Scheme was approved in November 2005 at a cost of ₹ 8.27 crore. The Central Design Organization (CDO), Nashik in November 2005 suggested certain modifications to the preliminary plan like change in location of pump house thereby reducing the lifting of water to one stage instead of three stages. However, the work order was issued in May 2007 without considering the suggestion of CDO. The plan was revised as per the CDO, Nashik suggestion only in March 2008 resulting in inclusion of 10 extra items at an additional cost of ₹ 10.51 crore. This could have been avoided if the suggestions of CDO, Nashik had been incorporated initially.

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54 It is a low level dam built across a stream for storage of water

55 Expenditure incurred on lifting and transportation of material

56 During execution of tunnel work loose rocks were found resulting in rock falls hence permanent support in the form of rock bolts had to be made to stabilize the rocks

- The work on Korle-Satandi medium irrigation project commenced from January 2004. WRD decided (October 2006) to shift the dam 200 metre upstream on the ground that only one ha of forest land would be required instead of 4.36 ha and a decrease in dam height. The shifting of the dam after a lapse of two years and nine months from the date of commencement of work indicated poor survey and planning. The dam work was completed in June 2013.
- AA to Dendonwadi minor irrigation project was accorded in December 1997 at a cost of ₹ 12.44 crore. The dam work commenced in January 1998 but stopped in December 1999, due to protest by the PAPs. After acquiring (2001) the major portion of land[57] the work was restarted and the dam work completed in June 2009. However, only 1.37 mcum (June 2009) could be stored against the capacity of 10.16 mcum to prevent submergence of State Highway (connecting Panadur and Ghotage) and private forest land. Thus, lack of proper survey before execution of the project resulted in under utilisation of the dam capacity to the extent of 87 *per cent*, despite an expenditure of ₹ 26.44 crore. The Government stated (July 2013) that in order to prevent submergence of the State Highway, construction of a diversion road was planned but, its execution was held up due to non-availability of minor minerals like metal, sand, *etc*. The Government however, accepted that unless forest clearance for the private forest land is received and the same is transferred, full storage in the dam is not possible. The case clearly indicated improper planning and survey and lack of effective follow-up in getting forest clearance even after 15 years of commencement of work (January 1998) up to November 2013.
- Tender for construction of dam, waste weir[58] *etc.* in respect of Virdi minor irrigation project was awarded (April 2007) at a cost of ₹ 17.97 crore for completion in 48 months. The villagers of Virdi village opposed the construction due to the submergence issues and suggested an alternative site. Survey work was carried out at the new location and technical sanction for alternative site was accorded for ₹ 32.79 crore (March 2008). Further, the height of dam was increased from 50.387 m to 61.987 m with additional storage of 7.881 mcum in August 2011 due to demand (January 2011) of water from the villages of Usap, Khokral and Pikule. Accordingly, a revised AA for ₹ 151.57 crore was submitted by the KIDC and approval from the State Level Technical Advisory Committee was awaited (July 2013). The Government stated (July 2013) that the dam site was shifted to address the submergence issues and the height was increased to provide water to the three villages and therefore, the delay was unavoidable. The reply is not acceptable as change in dam site and increase in height of dam clearly indicated that the stakeholders were not consulted before commencement of the project and inadequacies in survey.

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[57] 120.74 ha of private land was acquired while 6.56 ha of Government land and 1.21 ha of private forest land not acquired

[58] A waste weir is a portion of headwork in the dam that provides a means of removing excess water from the dam

VIDC

- GoM accorded first revised AA for ₹ 23.38 crore[59] (December 2005) to Antargaon minor irrigation project. The dam was shifted downstream on second survey as the submergence area and storage capacity was incorrectly assessed during the first survey. During execution of works in February 2006 the soil was found to be inappropriate for resting the foundation, therefore, the design had to be revised leading to an increase in project cost by ₹ 14.17 crore. Approval to the second revised AA submitted (May 2010) to the Government was awaited as of July 2013.

3.2.5 Irregular approvals of works

The powers to accord Administrative Approval (AA) and Revised Administrative approval (RAA) to works as per the respective Acts were vested with MKVDC and TIDC whereas such powers to accord AAs/RAAs to works were exercised by WRD in respect of VIDC, KIDC and GMIDC. These powers to accord AA/RAA to works were amended from time to time by the Finance Department (FD) and the Water Resources Department (WRD) from December 2003 onwards, in contravention of Governor's directives that no new works should be taken up in non-backlog districts. Moreover, approval to works were granted by the IDCs were in violation of the delegated powers as shown in **Table 3.7** below.

Table 3.7: Violation of powers delegated to IDCs to accord AAs

IDC	Powers granted	Violation	Impact
1. All IDCs	Power to accord AAs/RAAs were provided in the Act of MKVDC and TIDC since inception, irrespective of backlog and non-backlog areas These powers were granted to GMIDC, KIDC and VIDC at par with MKVDC and TIDC for removal of backlog only vide GR dated 4 December 2003.	Acts of the IDCs were to be amended as per paragraph 8 of the GR dated 4 December 2003, which was not done as of July 2013.	AAs/RAAs granted by the IDCs were not in conformity with their respective Acts and was thus, irregular. The Government while accepting the fact stated (July 2013) that the Acts will be amended in due course.
	All the IDCs were empowered to accord AAs/RAAs for removal of backlog subject to obtaining the consent of Chief Accounts and Finance Officer (CAFO) of the respective IDCs.	In 38 projects under VIDC involving expenditure of more than 75 *per cent* of the estimated cost, AA to 22 projects (₹ 301.67 crore) and RAA to 16 projects (₹ 3,346.80 crore) were granted without consent of CAFO.	Grant of AAs/RAAs to 38 projects without consent of CAFO was irregular.
2. MKVDC	As per Section 19 of MKVDC Act, the Governing Council (GC) of MKVDC was empowered to grant AAs and RAAs. Section 63 of the Act stipulated that the GC could delegate its powers with the previous approval of Government.	GC delegated (June 1996) the power to grant AAs and RAAs (July 1999) to the Executive Director with the concurrence of the Chairman of MKVDC. However, MKVDC did not obtain approval of the Government for such delegation.	AAs accorded to 277 irrigation projects for an amount of ₹ 2,808.62 crore (between 1996 and December 2007) and RAAs accorded to 23 projects (between July 2007 and August 2009) for ₹ 252.30 crore by the ED with the approval of Chairman was thus, irregular.

[59] Original AA for ₹ 11.78 crore was accorded in June 2000

			The Government stated (July 2013) that the GC of MKVDC has laid down administrative procedure for granting RAA and accordingly the AAs were granted. The reply is not acceptable as the delegation of powers by GC to the ED with the concurrence of the Chairman contravened Section 63 of the MKVDC Act that stipulated previous approval of the State Government for delegation of any of its powers by the IDC.
	Powers to accord AAs to minor irrigation projects valuing more than ₹ 25 crore and all major and medium irrigation projects were vested with Finance Department as per GR (March 2007) of FD.	ED with the consent of CAFO and approval of Chairman accorded RAAs to three minor projects valuing more than ₹ 25 crore and a LIS project.	Granting of RAAs to three[60] minor projects valuing more than ₹ 25 crore and one[61] LIS project totalling ₹ 133.33 crore was irregular. The Government stated (July, 2013) that the contention of Audit to apply powers of AA to powers of RAA does not appear to be logical as no specific financial limit is prescribed for according RAA in the GR of March 2007. The Government's reply is not tenable as while no specific financial limit is prescribed for according RAA in the GR of March 2007, the powers to grant AAs was in fact applicable to RAAs also, as has been clarified by the Government in its earlier Circular of 7 October 2006.
	WRD withdrew the powers of MKVDC to accord RAAs to any project vide GR dated 20 August 2009.	The ED with the concurrence of the Chairman of MKVDC continued to accord RAAs between 24 August 2009 and 4 September 2009.	RAAs were accorded to six projects for an amount of ₹ 64.28 crore (between 24 August 2009 and 4 September 2009), which was irregular. The Government stated (July 2013) that the copy of the GR was received by MKVDC on 4 September 2009. Meanwhile, during this period RAAs to six projects were accorded by MKVDC. The fact remained that post facto approval of WRD for these violations was not obtained.

[60] Jadhavwadi MI Tank (September 2008): ₹ 26.03 crore; Aasti (Nimgaon) (March 2009): ₹ 29.52 crore; Ambewadi (June 2009): ₹ 25.23 crore

[61] Shirala LIS project (September 2008): ₹ 52.55 crore

3. All IDCs	The FD allowed all the IDCs the power to grant AAs to all projects in 21 districts based on the irrigation backlog of 2005 vide GR dated 13 March 2007.	As per the information available on the website[62], as on June 2006 the physical backlog was only in 13 districts. There was no backlog in eight[63] districts as mentioned in GR of 13 March 2007.	During March 2007, AA was granted by GMIDC to one project amounting to ₹ 4.06 crore in Beed. In addition, GMIDC also accorded AAs (June 2007) to two projects valuing ₹ 7.92 crore in Nanded district, even though the district was not included in 21 backlog districts notified in the GR of FD (March 2007).
4. VIDC and GMIDC	WRD granted (11 April 2007) powers to VIDC and GMIDC to accord AA to projects located in backlog districts	AA/RAA was granted in non-backlog districts as notified in the website of MWRRA as in June 2007.	In violation, GMIDC granted AAs to 17 projects for an amount of ₹ 738.69 crore during the period July 2007 to July 2009 in five non-backlog districts of Nanded, Beed, Aurangabad, Latur and Osmanabad. In violation, VIDC granted AAs to 19 projects for an amount of ₹ 1,630.03 crore during the period August 2007 to August 2009 in all the six non-backlog districts of Nagpur region *i.e.* Nagpur, Bhandara, Gondia, Wardha, Gadchiroli and Chandrapur.
5. GMIDC, TIDC and KIDC	WRD granted (June 2007) powers to GMIDC, TIDC and KIDC to accord AA to projects located in seven backlog districts (Nashik, Dhule, Jalgaon, Nandurbar, Raigad, Ratnagiri and Sindhudurg).	As per information available on the website as on June 2007, there was no backlog in Raigad and Sindhudurg districts under KIDC and in Dhule, Jalgaon and Nashik districts under TIDC/GMIDC. Further, there was no backlog in Nandurbar district from June 2008 under TIDC but GR of June 2007 was not amended in 2008 to exclude these six districts where there was no backlog.	TIDC accorded AA to one project for an amount of ₹ 25.21 crore and RAA to 41 projects for an amount of ₹ 5,105.53 crore[64] during the period June 2007 to August 2009 in non-backlog districts in violation of WRD's orders.

[62] www.mwrra.org.in

[63] Nashik, Jalgaon, Dhule, Beed, Osmanabad, Latur, Nagpur and Gadchiroli

[64] Including RAA for ₹ 601.93 crore granted for 11 projects in Nandurbar district during June 2008 to August 2009

6. GMIDC and VIDC	WRD in August 2009 cancelled powers of GMIDC and VIDC to grant RAA in respect of 'A' category[65] projects, except in the irrigation backlog districts of Jalna and Osmanabad (GMIDC), Buldhana, Akola, Washim and Gadchiroli districts (VIDC).	As per information available on the website as on June 2009, there was no backlog in Jalna and Osmanabad districts under GMIDC and Gadchiroli district under VIDC.	In August 2009, RAAs to nine projects were accorded by GMIDC valuing ₹ 7,766.66 crore in non-backlog districts of Beed, Osmanabad, Nanded, and Yavatmal. During June 2011 to May 2013, AAs to 23 irrigation projects were accorded by VIDC valuing ₹ 62.03 crore in three non-backlog districts of Nagpur region, *i.e.* Bhandara, Gondia and Chandrapur. Thus, according of AA to 63 projects amounting to ₹ 2,467.94 crore by GMIDC, VIDC and TIDC (as mentioned at Sr. No. 3 to 6 above) in the non-backlog districts in violation of orders of delegation was irregular and affected the balance regional development of the IP in the State. The Government stated (July 2013) that the delegation of powers was first given (2007) for 23 districts having an updated physical backlog of 50.52 *per cent* as on June 2006. Subsequently, the powers were limited to districts having financial backlog as per Governor's directives of May 2009. The reply is not acceptable as the State average of irrigation potential created as percentage of net sown area as on 1994 was 35.11 *per cent*, which was accepted by the Government. Further, there were only 13 districts having physical backlog as on June 2006 with reference to the State average, which came down to nine districts in June 2007. Thus, by introducing the element of updated physical backlog, the Government circumvented the Governor's directives over the years, which specifically laid down that no new works be approved in non-backlog areas.

In the exit conference the CE, WRD stated (July 2013) that revised RAAs were issued frequently based on the demands of local representatives. The

[65] 'A 'category project are those where the expenditure is within the existing AA/RAA and project cost is within the norms but revision of cost is necessary

frequent issue of GRs necessitating frequent changes in the system of grant of AAs indicated lack of a robust system in the WRD, besides violation of the Governor's directives. The WRD needs to establish a well-defined system for grant of AAs and RAAs.

3.2.6 Cost overrun and delays in execution of projects

WRD was not using modern project management techniques like Programme Evaluation and Review Technique in project execution. Data of all the 601 ongoing projects as of June 2013 furnished by the IDCs including the 87 test-checked projects were analysed in audit to assess the number of years these projects were under execution. The summarized position is given in **Table 3.8** and **Table 3.9** respectively.

Table 3.8 Age analysis of ongoing projects under WRD as on June 2013

Age Profile (since the date of original AA)	Total projects			
	Major	Medium	Minor	Total
More than 30 years	31	21	25	77
More than 20 years but up to 30 years	9	18	45	72
More than 15 years but up to 20 years	19	23	34	76
More than 10 years but up to 15 years	9	22	96	127
More than 5 years but up to 10 years	3	3	90	96
Up to 5 years	1	24	128	153
Total	72	111	418	601
Source: Information furnished by IDCs				

Table 3.9: Age analysis of the ongoing test-checked projects as on June 2013

Age Profile (since the date of original AA)	Total projects			
	Major	Medium	Minor	Total
More than 30 years	9	3	4	16
More than 20 years but up to 30 years	0	3	4	7
More than 15 years but up to 20 years	5	4	6	15
More than 10 years but up to 15 years	2	3	9	14
More than 5 years but up to 10 years	0	1	2	3
Up to 5 years	0	1	6	7
Total	**16**	**15**	**31**	**62**[66]
Source: Information furnished by IDCs				

Table 3.8 shows that 225 projects (37.44 *per cent*) were under execution for more than 15 years and of these, 77 projects (12.81 *per cent*) were under execution for more than 30 years. **Table 3.9** in respect of the test-checked projects shows that 38 projects (43.68 *per cent*) were under execution for more than 15 years and of these, 16 projects (18.39 *per cent*) were under execution for more than 30 years.

The main reasons for the time overrun were paucity of funds, delays in acquisition of forest and private land, re-settlement problems of PAPs, change of design *etc.* which in turn led to increase in project cost. The details of time and cost overruns in respect of 87 test-checked projects are indicated in **Appendix 3.1**. The quantum of cost overrun in 83[67] out of 87 test-checked projects and all the 601 ongoing projects in the IDCs as on June 2013 is summarised in **Table 3.10** and **Table 3.11** respectively.

[66] Excluding 25 completed projects

[67] There was no cost overrun in four out of 87 test-checked projects

Table 3.10: Cost overrun and balance cost in respect of test-checked projects (₹ in crore)

IDC	Number of Projects	Amount of original AA	Expenditure up to June 2013	Cost overrun	Updated cost	Balance cost
GMIDC	20	346.80	3486.72	3139.92	6243.03	2763.64
KIDC	11	198.46	1844.11	1645.65	2918.44	1074.33
MKVDC	15	2253.22	5447.69	3194.47	11531.03	6083.34
TIDC	13	665.56	2287.16	1621.60	5229.69	2942.53
VIDC	24	665.06	3871.06	3206.00	6104.17	2254.09
Total	**83**	**4129.10**	**16936.74**	**12807.64**	**32026.36**	**15117.93**
Source: Information furnished by the IDCs						

Table 3.10 shows that cost overrun in 83 projects was ₹ 12,807.64 crore (June 2013) *i.e.* an increase of 310.18 *per cent* over the original cost. Further, the IDCs would require (June 2013) an additional amount of ₹ 15,117.93 crore to complete these projects.

Table 3.11: Cost overrun and balance cost in respect of all the ongoing projects

(₹ in crore)

IDC	Status of 601 ongoing projects				Status of 363 out of 601 ongoing projects with cost overrun					
	Number of projects	Expen-diture	Updated cost	Balance cost	Number of projects	Amount of original AA	Expen-diture	Cost overrun	Up dated cost	Balance cost
MKVDC	94	17056.15	34594.58	17538.43	68	4119.27	16489.63	12370.36	32276.16	15786.53
KIDC	64	6020.58	11662.04	5641.46	54	783.49	5991.18	5207.69	11275.68	5284.50
TIDC	58	3799.41	14649.81	10850.40	36	1157.93	3615.44	2457.51	8885.59	5270.15
VIDC	257	22612.82	55759.32	33146.50	138	4137.38	20993.72	16856.34	39040.06	18046.34
GMIDC	128	12149.47	27582.32	15432.85	67	886.02	11421.22	10535.20	21145.06	9723.84
Total	**601**	**61638.43**	**144248.07**	**82609.64**	**363**	**11084.09**	**58511.19**	**47427.10**	**112622.55**	**54111.36**
Source: Information furnished by the IDCs										

Table 3.11 shows that the balance estimated cost of 601 projects as of June 2013 was ₹ 82,609.64 crore. Of these 601 projects, there was cost overrun in 363 projects amounting to ₹ 47,427.10 crore (June 2013) *i.e.* an increase of 427.88 *per cent* of the original cost.

There was mismatch in the progress of dam and canal works indicating lack of coordinated approach to execution of projects, leading to delays. In 87 test-checked projects, even though the dam works were completed in 36 projects the canal works were incomplete as shown in the **Table 3.12**.

Table 3.12: Status of completion of dams and canals in the IDCs

IDC	Number of Projects (other than LIS)	Dam was completed but canals incomplete	Number of years since dam work completed but canal incomplete
MKVDC	13	7	0-20
GMIDC	19	8	2-8
VIDC	23	14	3-20
KIDC	11	2	7-22
TIDC	11	5	15-36
	77[68]	**36**	0-36
Source: Information furnished by the IDCs			

The Government stated (July-September 2013) that:

[68] Excluding eight LIS, one completed project (Bhosekhind) under MKVDC and one project under KIDC (Roshni) where both dam and canal works were completed

- All Executive Directors, Chief Engineers and Superintending Engineers have been directed to use project management related software for project management.
- Cost overrun was due to non-availability of adequate funds, rise in prices of construction material, delays in project due to opposition from PAPs, *etc*.
- When a project is being taken up it is simply mentioned that the same would be completed in five years though it is a fact that in five years even land acquisition cannot be completed.
- Cost and time overrun in irrigation projects was unavoidable and these could be reduced only by putting more appropriately planned cash flows, prioritization in completion of projects and total stoppage of some of the projects which required support of Planning and Finance departments.

In the circumstances explained, the Government may:

- decide to prioritise allocation and release of funds to projects which have been started and not completed till date, to increase the IP of the State; and
- not release funds to IDCs for projects where all clearances have not been obtained and where land has not been acquired.

3.2.7 Irregular expenditure in excess of original and revised AAs

As per the MPW Manual, RAA should be obtained when the expenditure exceeds the AA by more than 10 *per cent* or ₹ one crore, whichever is less and excess over the amount of RAA should not be allowed without the permission of the competent authority.

Audit scrutiny revealed that the IDCs in violation of the MPW Manual incurred an expenditure of ₹ 133.42 crore over and above 10 *per cent* of the AA amount in 21 out of 601 ongoing projects, while in 100 ongoing projects an expenditure of ₹ 2,367.28 crore was incurred over and above the RAA, without the approval of the competent authority. The details are shown in **Table 3.13**.

Table 3.13: Expenditure in excess of AAs pending regularisation (₹ in crore)

Name of the IDC	Nos. of Projects	AA	AA + 10 *per cent*	Expenditure	
				As of 30 June 2013	Excess over 10 *per cent* (5) – (4)
(1)	(2)	(3)	(4)	(5)	(6)
Excess over the original AA					
MKVDC	14	103.28	113.61	**148.62**	**35.01**
KIDC	6	119.41	131.36	224.43	93.07
GMIDC	1	4.99	5.49	10.83	5.34
Total	**21**	**227.68**	**250.46**	**383.88**	**133.42**

Excess over the revised AA				
Name of the IDC	**Nos. of Projects**	**RAA**	**Expenditure up to 30 June 2013**	**Excess expenditure (4) – (3)**
(1)	**(2)**	**(3)**	**(4)**	**(5)**
MKVDC	9	886.47	**2477.15**	**1590.68**
GMIDC	15	340.32	414.41	74.09
VIDC	30	723.91	1029.58	305.67
KIDC[69]	20	960.90	1253.91	293.01
TIDC	26	187.30	291.13	103.83
Total	**100**	**3098.9**	**5466.18**	**2367.28**
Total excess expenditure ₹ 133.42 crore + ₹ 2367.28 crore = ₹ 2,500.70 crore				

Audit scrutiny further revealed that AA for Hetawane medium irrigation project under KIDC, was accorded (January 1981) for ₹ 15.36 crore. The second RAA was granted (March 2000) for ₹ 208.54 crore. Due to increase in demand for water for non-irrigation purpose, a High Power Committee[70] of Ministers reserved 48.64 mcum of water to four[71] agencies. Third RAA was granted (June 2008) by GoM for ₹ 329.90 crore on the condition that the capital cost of the dam and restoration charges[72] amounting to ₹ 190.48 crore would be recovered from the four agencies by July 2008. However, these agencies did not pay[73] their share of dues (₹ 190.48 crore) as of November 2013. KIDC spent ₹ 291.15 crore on the project till June 2013, including ₹ 22.27 crore spent (2009-13) since the grant of third RAA.

The Government stated (July 2013) that the process of granting RAA to the project is very lengthy and takes two to three years and hence in the interest of work the same is continued in anticipation of getting the sanction. The reply is not acceptable as it results in violation of codal provisions and a system should be put in place to ensure sanction of RAA well in time or else the purpose of obtaining RAA becomes a formality.

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69 Mention was made in the Audit Report (Civil) of C&AG of India for the year 2009-10 on GoM that KIDC had incurred (as of March 2010) an expenditure of ₹ 132.06 crore over and above the AA in respect of 12 projects

70 Allocation of water for non-irrigation purpose by more than 25 *per cent* was to be referred to a High Power Committee headed by the Minister (Water Resources), Minister (Finance), Minister (Water Supply and Sanitation), Minister (Industries), Minster (Agriculture) and Minister of State (Water Supply)

71 City and Industrial Development Corporation, ISPAT, Tata Power and provision of drinking water to Vashi Village, under Swajaldhara programme by Maharashtra Jeevan Pradhikaran Division, Mangaon

72 For any change in reservation of water by more than 25 *per cent* for non-irrigation purpose, restoration charges were recoverable at the rate of ₹ 50,000 per ha

73 Only ₹ nine crore was paid by CIDCO in March 2009

3.2.7.1 Irregularities in Kondhane Project

Audit scrutiny revealed major irregularities in award of work of the Kondhane minor irrigation project by KIDC in violation of the conditions of AA granted by WRD, which is discussed below.

AA to the project for creation of irrigable command area of 240 ha was accorded (May 2011) by WRD for ₹ 80.35 crore subject to the conditions that (a) the scheme in the present state be kept on shelf *i.e.* not be taken up for execution except for various clearances/permissions (b) the approval be considered only after water availability certificate was received from CE, Hydrology, Nashik. Technical sanction to the work of dam proper, saddle dam[74] and head regulator[75] was accorded on 27 May 2011 for ₹ 57.86 crore.

The tender notice for the work was published in National/State level newspapers on 1 June 2011. Four contractors submitted the bids by 20 June 2011. Three bids *viz.* M/s F. A. Enterprises, Mumbai; M/s F.A. Constructions, Mumbai and M/s A.B. Nagi Reddy were found to be eligible. Audit noticed that M/s F.A. Enterprises and M/s F.A. Constructions were registered at the same address and had the same partners which vitiated the tender process. The work was awarded to the lowest bidder (M/s F. A. Enterprises, Mumbai) on 22 July 2011 at a cost of ₹ 58.95 crore (which was 4.95 *per cent* above the estimated cost put to tender) for completion in 36 months. Audit scrutiny revealed the following:

- Section 2 (e) (iii) of KIDC Act, 1998 mandated planning, construction, maintenance and management of minor irrigation projects having irrigable command area of more than 250 ha and up to 2,000 ha. The projects with irrigable command area below 250 ha were to be executed by the local sector wing under the Rural Development and Water Conservation Department of GoM. Thus, implementation of Kondhane minor irrigation project with irrigable command area of 240 ha by KIDC was irregular.
- The GC of KIDC granted (12 August 2011) in-principle approval for increasing the height of the dam from 39.03 meter to 71.33 meter. The approval was granted based on a request (23 May 2011) made by the local Member of Legislative Assembly to the Minister, WRD for storage of more water for non-irrigation use. Accordingly, the work of dam with increased height of 71.33 meter was awarded (24 August 2011) to the same contractor at an additional cost of ₹ 271.45 crore. The sequence of events clearly indicated that KIDC was aware of the issue of dam height as early as May 2011. Under the circumstances, issue of tender (June 2011) with a dam height of 39.03 metre, followed by its award in July 2011 and re-award in August 2011 to the same contractor for increased height (71.33 meter) within 33 days of the initial award, was highly irregular which resulted in undue benefit to the contractor and vitiated the principles of transparency in contract management.

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[74] A saddle dam is an auxiliary dam constructed to confine the reservoir created by a primary dam either to permit a higher water elevation and storage or to limit the extent of a reservoir for increased efficiency

[75] Construction at the off-take of a channel subsidiary to a main canal. Piers with grooves are provided for the use of shutters to regulate the water flow for distribution

- Though the AA to the work specified that the project be kept on shelf, the project was taken up. Further, the work was awarded in July 2011, even before the receipt of water availability certificate (October 2011).
- Tenders were invited in June 2011 and work awarded in July 2011, though approval to dam design was not received from CDO, Nashik (October 2013). The proposal for design approval was forwarded to CDO, Nashik only on 24 January 2012 *i.e.* five months after the additional work was awarded to the contractor.
- A proposal seeking No Objection Certificate from Archaeological Survey of India (the ancient monument *viz.* the Kondhane Caves are nearby) forwarded by KIDC in June 2012 was pending (October 2013).
- Environmental Clearance (EC) was not obtained before commencement of work and the proposal seeking environmental clearance was forwarded by KIDC only in May 2012 *i.e.* nine months after the date of issue of work order. The EC to the project was pending (October 2013).
- Central Railway intimated (16 January 2012) WRD to stop the work as the same was adjacent to the railway track.

KIDC issued an order in May 2012 for cancellation of the additional work as revised AA was not obtained from GoM. GoM also directed (May 2012) KIDC to cancel the work as the condition of keeping the project on shelf stipulated in the AA was not adhered to. Accordingly, KIDC rescinded (29 December 2012) the contract which was challenged by the contractor (January 2013) in Mumbai High Court. In its interim order (February 2013), the High Court directed WRD to clear the bills of the contractor within three months. As per the joint measurement carried out (March 2013), the cost of work done was ₹ 90.04 crore. However, payment to the contractors was pending (July 2013).

Clearly, the Government incurred a financial liability of ₹ 90.04 crore from the incomplete works of Kondhane project which was taken up without regulatory permissions and other mandatory clearances. The selection of contractor was not transparent and the award of work for increased height of dam was highly irregular.

The Government accepted (November 2013) that the work was taken up without fulfilling the conditions mentioned in the AA. It added that action against the concerned officials shall be taken after enquiry into the matter.

3.2.8 Inadequacies in preparation of estimates

As per Para 140 (2) of MPW Manual, estimates should always be prepared in sufficient detail to ensure that the responsible officer has given proper consideration to the requirements of the work. The estimates for work are prepared based on the Schedules of Rates (SoR) maintained by WRD. Audit noticed various deficiencies in the preparation of estimates such as non-fixation of standard rates for the different components of tunnel work, inclusion of in-admissible component of labour welfare cess, central excise, service tax *etc*. Cases of improper preparation of estimates leading to granting of undue benefit of ₹ 33.20 crore to the contractors are detailed in **Appendix 3.5**. A few cases are discussed in detail below:

- The SoR maintained by WRD did not contain the rates for tunnel work. In the absence of rates in the SoR, rates were fixed locally by the divisions. An inter-comparison of rates included in the estimates (SoR 2008-09) for tunnel works in three[76] projects awarded in 2009 revealed wide variations. The labour component varied from ₹ 112/cum to ₹ 486.49/cum; machinery charges from ₹ 673.79/cum to ₹ 1,858.38/cum; material charges from ₹ 325.37/cum to ₹ 849.33/cum and ventilation charges from ₹ 41/cum to ₹ 281/cum. In the absence of standard rates for tunnel work, it was not possible to determine the reasonableness of the rates. The Government stated (September 2013) that a Common Schedule of Rates (CSR) including tunnel work for the year 2012-13 was being finalised by a Committee under the Chairmanship of Chief Engineer (Vigilance and Projects) and Joint Secretary and was expected to be finalised by the end of October 2013.

- As per Para 55 (E) of the MPW Manual, the Mechanical Organization, Nashik (MO) of WRD is responsible for manufacture of sluice gates, heavy radial gates and hoists in its own workshop located at various places in the State. The MO also issues a common SoR for various types of gates used in dam works and its components every year. MO prepared (January 2008) a rate analysis of different components of barrage on Godavari and Manjra river based on SoR (2007-08). Audit scrutiny of 10[77] works of barrages (Vishnupuri, Krishna-Marathwada, Babhli projects) and one work of dam gates (Lendi Project) under GMIDC revealed that the project authorities (*i.e.* CE, SE and EE) prepared the estimates for these works (2004-05 to 2008-09) in which the fabrication and erection cost of gates were found to be much higher than the rates for similar type of gates given in the SoR of the MO for the relevant year. This was due to non-adoption of steel, workshop and labour costs from the SoR of MO. As the SoR issued by MO every year contained the input costs and other overheads incidental to the manufacture of all types of gates, non-adoption of rates from SoR of MO was irregular and resulted in preparation of inflated estimates for original items (Schedule B), extra items (Extra Items Rate List) and extra quantities (under Clause 38) by ₹ 28.81 crore.

The Government stated (July 2013) that works of vertical lift gates[78], stoplog gates[79] *etc.* are not mentioned in the scope of MO. It further stated that the SoR of MO are to be used invariably for fabrication works carried out in the workshop of MO only. It added that the rate analysis of mechanical works were either got technically cleared from the Chief Engineer, MO or framed using MO SoR by updating the basic cost of structural steel as per the PWD DSR/market rates prevailing at the time of sanction. However, other

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[76] Upper Pravara Left Bank Canal, Manjarpada Diversion Scheme and Nira Bhima Link Project

[77] Tarugavan, Dhalegaon, Mudgal, Muli, Somanthali, Babhli, Balegaon, Amdura, Digras and Mangrul

[78] A dam spillway gate of which the movable parts are raised and lowered vertically to regulate water flow

[79] Gates used for level control in open channel where the beams are inserted in grooves cast in channel wall

provisions such as, workshop charges, fabrication charges, execution charges *etc.* were kept as per MO SoR.

The Government's contention is not acceptable for the following reasons:

- The MO, Nashik carries out fabrication and erection of various types of gates and hoists (radial gate, sluice gate, barrage gate, stoplog gate, hoist, goliath crane *etc.*) as evident from the website of MO, Nashik (www.mahayantriki.gov.in).
- The contractors also establish their own workshops at the project/work sites. Therefore, fabrication cost which includes similar components like material cost, labour cost, workshop charges and handling charges (as contained in MO SoR) would be applicable for works executed at work sites also.
- The technical sanctions to the estimates of these 11 works were in fact accorded by the Chief Engineer (WRD), Aurangabad using the PWD DSR rates for structural steel and the rates of other components were worked out in excess of the MO SoR of the relevant year.
- As dam/barrage works are not executed by the PWD, adoption of PWD DSR for execution of these works was not in order.

3.2.9 Execution of lift irrigation Schemes

A Lift Irrigation Scheme (LIS) is constructed in drought prone areas, where the topographical conditions is unsuitable for flow irrigation like hilly areas. A typical LIS comprises storage, pump house, pumping machinery, raising main, distribution chamber and canals.

The GoM in 1978 took a decision not to take up LI Schemes in future as these were not found to be effective due to very low IP utilisation, continuous losses and high cost of maintenance. Even the Deokule Committee formed in 2002 by the GoM had recommended that no new LISs should be taken up due to high costs of infrastructure, maintenance and repairs and high cost of tariff compared to flow irrigation. The committee had also noted that most of the LI schemes completed and handed over to the Management Divisions were non-operational due to non-payment of electricity bills. An overview of the ongoing LI schemes under implementation by the IDCs is given in **Table 3.14**.

3.14: Cost overrun and balance cost in respect of Lift Irrigation Schemes (₹ in crore)

Project details of 64 LIS								
IDC	No. of Projects	Projects with cost overrun	Amount of AA	Expenditure as on June 2013	Up to date cost as on June 2013	Cost overrun over expenditure	Balance cost	Balance cost of total LIS
TIDC[80]	7	2	509.34	908.59	2273.97	399.25	1365.38	6393.79
GMIDC	4	2	2.99	116.76	660.94	113.77	544.18	553.60
MKVDC	20	14	2334.75	4757.49	10442.17	2422.74	5684.68	7022.24
VIDC[81]	32	17	578.98	1285.91	2205.28	706.93	919.38	2334.68
KIDC	1	0	0.00	0.00	0.00	0.00	0.00	12.70
Total	**64**	**35**	**3426.06**	**7068.75**	**15582.36**	**3642.69**	**8513.62**	**16317.01**
Source: Information furnished by the IDCs								

Table 3.14 indicated that there was cost overrun of ₹ 3,642.69 crore (106.32 *per cent*) and the WRD would require an estimated amount of ₹ 16,317.01 crore for completion of the 62 ongoing LI schemes. Audit findings on test-checked LIS under MKVDC and TIDC are discussed in **Table 3.15**.

Table 3.15: Audit findings on test-checked LI Schemes

Name of the LIS and other details of AA *etc.*	Salient features of LIS	Audit remarks and Government reply
(1) Tembhu LIS under MKVDC ➢ AA for ₹ 1,416.59 crore (February 1996). ➢ RAA for ₹ 2,106.09 crore (January 2004). ➢ Updated cost ₹ 3,832.98 crore. ➢ Total expenditure incurred (June 2013) on the entire project was ₹ 1,417.03 crore and balance updated cost of completion was ₹ 2,415.95 crore (June 2013).	➢ Envisaged lifting of 22.13 TMC of water in five stages from Tembhu barrage on Krishna river near village Tembhu Taluka Karad, District Satara. ➢ To utilize the water through canals of 350 Km to irrigate 1,11,856 ha of drought prone area of 211 villages in the talukas of Karad (Satara), Kadegaon, Khanapur, Tasgaon, Kavathemahankal, Atpadi (Sangli) and Sangola (Solapur).	➢ Of the total IP projected to be created (1,11,856 ha), IP of 4,437 ha was created (June 2013) from Stage 1 (IA, IB and II) after incurring an expenditure of ₹ 778.30 crore. ➢ Balance IP to be created was 1,07,419 ha (including 9,359 ha from Stage 1 and 2). ➢ No IP was created from Stage 3 to 5 even after incurring an expenditure of ₹ 492.66 crore. ➢ Construction of Visapur Pundi LIS and Ghatnandre Tisangi LIS, which were also an integral part of this LIS, did not commence. ➢ Second RAA of ₹ 3,832.98 crore was pending with GoM since December 2011 (as of October 2013). The Government stated (July 2013) due to shortage of funds works could not be completed as per schedule. ➢ In the work of Tembu LIS, two contractors were paid interest free advance of ₹ 16.39 crore though there was no such provision in the contract, resulting in undue benefit to the contractors. An amount of ₹ 11.80 crore[82] was still pending adjustment (June 2013). The Government stated (October 2013) that advance payment was made towards erection, testing and commissioning of pumps. Reply is not acceptable as payment of mobilisation advance was not provided in the tender/contract conditions.

[80] In respect of two out of seven LIS only; in the remaining ongoing LIS there was no cost overrun as of June 2013

[81] In respect of 17 out of 32 LIS only; in the remaining ongoing LIS there was no cost overrun as of June 2013

[82] (1) M/s Kirloskar Brothers Ltd
Advance paid: ₹ 11.55 crore (May 2005 to April 2010); Advance adjusted ₹ 3.81 crore (September 2007 to February 2010); Balance to be recovered: ₹ 7.74 crore
(2) M/s Mather & Platt and Subhash Project: Advance paid ₹ 4.84 crore (February 2007 to April 2010); Advance adjusted: ₹ 0.78 crore (July 2010); Balance to be recovered: ₹ 4.06 crore

(2) Janai-Shirsai LIS (JSLIS) under MKVDC ➢ AA for ₹ 56.92 crore (November 1993) ➢ RAA for ₹ 144.24 crore (February 2000) ➢ Second RAA ₹ 199 crore (December 2004) and ➢ Third RAA for ₹ 411.72 crore (June 2011) ➢ An expenditure of ₹ 279.78 crore was incurred on the scheme (June 2013) and the balance cost for completion of the project was ₹ 131.94 crore.	➢ Envisaged lifting of 3.60 TMC of water in three stages, through Janai (IP of 8,350 ha) and Shirsai Lifts (IP of 5,730 ha). ➢ targeted IP of 14,080 ha in drought prone areas of Daund, Baramati and Purandar talukas in Pune District.	➢ Stage I and II of Janai Lift (3,289 ha) and Stage I of Shirsai Lift (4,772 ha) have been completed in 2000, creating an IP of 8,061 ha, with IP utilisation of 600 ha only; ➢ Stage III of Janai Lift was in progress; three switchyard equipment and two power transformers (₹ 66.90 lakh), pump sets, induction motors (₹ 2.04 crore) procured in 2000-01 remained uninstalled (October 2013) for want of forest clearance and non-completion of civil works due to paucity of funds. Further, an additional amount of ₹ 41.69 lakh was estimated for repairs of the equipment (July 2012) which were damaged and had rusted in the intervening period. ➢ The Chaskaman Division took up the execution of distributaries in Kusegaon branch of Janai LBC from Km one to Km 13. Scrutiny revealed that three[83] works were stopped by the farmers as the irrigation was carried out by them through private lift irrigations on Victoria tank (Warwandi). Thus, lack of survey before taking up the work resulted in abandonment of the works and consequent wasteful expenditure of ₹ 95.84 lakh. The Government stated that the equipment would be used after commissioning the said project. Since the equipment and machinery have not been put to use for more than 12 years, its installation and commissioning after the project is completed appears doubtful as the wear and tear and obsolescence in these equipment would render them inefficient.
(3) Khura Vadhoda LIS under TIDC ➢ AA for ₹ 207.08 crore (July 1999) ➢ First RA for ₹ 503.64 crore (August 2007) ➢ Second RAA for ₹ 842.40 crore (May 2009). ➢ Total expenditure incurred as of July 2013 was ₹ 523.42 crore	➢ The scope of LIS included lifting of 50.79 mcum of flood water and storing in the dam to irrigate 9,725 ha of land. ➢ Initially the dam site was selected at Charthana village, Muktainagar, District Jalgaon and work order for construction of dam and LIS was issued in 1999. ➢ Due to high cost of acquisition (₹ 42 crore) of forest land, it was decided to shift the dam site to Islampur in Buldhana district. Irrigation of 17,967 ha was proposed in first RAA which was increased to 25,898 ha in second RAA considering drip irrigation.	➢ Expenditure of ₹ 1.45 crore incurred on the initial work of planning and designing (July 1999) was unfruitful due to high cost of acquisition of forest land necessitating the shifting of dam site from Charthana, Jalgaon district to Islampur, Buldhana district. The proposal of ED, TIDC sent in January 2009 for regularisation of the said expenditure was awaited (November 2013) from the Government. ➢ The work of LIS commenced in December 2008 *i.e.* even before commencement (May 2009) of dam work. Total expenditure of ₹ 523.42 crore has been incurred (July 2013) on the project (dam component has been completed up to 30 *per cent* while the LIS was completed up to 75 *per cent* as of June 2013). No IP was created as of June 2013. The Government stated that work would be completed as per availability of funds. Reply is not acceptable as TIDC could have paid ₹ 42 crore for forest land instead of shifting the dam site, which led to cost overrun of ₹ 635.32 crore (₹ 842.40 crore – ₹ 207.08 crore).

[83] (i) Construction of earth work and structure for Minor No. 8: expenditure ₹ 6.13 lakh-work was withdrawn in January 2011 under Clause 15
(ii) Construction of earth work and structure for Minor No. 3: ₹ 40.51 lakh-contractor has not yet applied for withdrawal under Clause 15
(iii) Construction of earth work and structure for Minor No: 6 to 7: expenditure ₹ 49.20 lakh-contractor applied for withdrawal in April 2009 but final decision not yet taken

(4) Varangaon Talvel Parisar LIS (in Jalgaon district) under TIDC: ➢ AA for ₹ 302.26 crore (July 1999) ➢ TIDC entered (August 2008) into a Memorandum of Understanding (MoU) with MAHAGENCO[84] for supply of additional 23.76 mcum of water for its thermal power station at Bhusawal through LIS. ➢ As per the MoU, in which the GoM was also a signatory, the GoM was to plan and complete the dam and lift components of the project and make necessary budget provisions for two financial years.	➢ Of the total revised project cost of ₹ 351 crore, MAHAGENCO was to bear one-third *i.e.* ₹ 117 crore of the cost and the remaining two-third *i.e.* ₹ 234 crore was to be borne by TIDC. ➢ MAHAGENCO was to provide an advance of ₹ 60 crore to be adjusted against the water charges payable by it. ➢ The project was to be completed by 31 December 2010.	➢ The project remained incomplete (June 2013) even after passage of 30 months from the agreed date of completion. The cost of project has shot up to ₹ 822.49 crore from ₹ 351 crore. ➢ Of the total expenditure of ₹ 422.74 crore incurred (June 2013), MAHAGENCO paid ₹ 158.67 crore. ➢ TIDC had contributed only ₹ 148.54 (63 *per cent*) crore out of it share of ₹ 234 crore. ➢ There was a shortfall of ₹ 85.46 crore in release of funds by TIDC disregarding the conditions of MoU. The Government stated that RAA for the increased cost of ₹ 822.49 crore was pending.

3.3 Contract management

Review of the contract management in the five IDCs revealed deficiencies such as awarding of work without invitation of tenders, irregular sanction of extra item of work, irregular sanction of mobilization advance to contractors, irregularities in recovery of royalty charges and insurance premium as discussed below:

3.3.1 Execution of works without inviting tenders

As per paragraph 200 of MPW Manual, tenders should invariably be invited publicly for all works to be given out on contract except extra items which have to be undertaken as part of a scheme for which tenders have originally been invited publicly and which are required to be executed while the work originally undertaken is in progress and which are really inseparable from the original contract and cannot conveniently be done by a different agency. Audit however, observed that in 19 projects, 24 individual items of works like construction of tunnel work, ring road, Irrigation cum Power Outlet (ICPO), canal work *etc.* amounting to ₹ 424.56 crore (**Appendix 3.6)** were attached to the respective original works without invitation of tenders, as summarised in **Table 3.16**.

[84] Maharashtra Electricity Generation Company Limited

Table 3.16: Awarding of works without inviting tenders **(₹ in crore)**

Name of the IDC	Number of individual works awarded without inviting tenders	Cost of work awarded without inviting tenders
MKVDC	5	193.32
GMIDC	12	196.59
KIDC	3	25.33
TIDC	4	9.32
Total	**24**	**424.56**

The Government stated (July 2013) that the additional works were executed with the original work to save time required in tender process.

The reply is not acceptable as awarding of works without inviting tenders violated the provisions of MPW Manual and extended undue benefit to the contractors.

3.3.2 Irregular sanction of extra items

As per the MPW Manual, estimates should be prepared in sufficient detail to ensure that the responsible officer has given proper consideration to the requirements of the work Further, the tender conditions required the contractors to familiarize themselves with the nature of work, site conditions *etc* before submitting the bids. Extra items may arise due to inadequate survey before preparation of the estimates, non-consideration of items in the original estimates, change in scope of works *etc*. Audit scrutiny revealed irregular sanction of extra item rate list (EIRL) to the contractors amounting to ₹ 28.53 crore as discussed in **Table 3.17**.

Table 3.17: Extra items sanctioned to contractors

Name of the IDC	Details of EIRL sanctioned	Name of the work and agency (Date of work order)	Audit remarks and Government reply
1	2	3	4
MKVDC	**Urmudi major irrigation project**: The difference between the rate of controlled blasting and normal blasting amounting to ₹ 1.02 crore was sanctioned (August 2009) as EIRL, though the contract was inclusive of controlled blasting, wherever required.	Construction of earthen dam with gated spillway across river Urmodi at Taluka Parali, District Satara M/s Mulay Brothers Private Limited and M/s Amit Constructions (Joint Venture)] (Date of work order-December 1997)	An amount of ₹ 98.06 lakh[85] was released to the contractor up to June 2013. The Government stated (October 2013) that EIRL was given due to proximity of canal to a fort, a temple and Village Parali. This necessitated excavation of 1,26,157 cum by controlled blasting as an extra item instead of normal open blasting, duly sanctioned by the competent authority. The reply is not acceptable as the same should have been considered by the contractor at the time of tendering and therefore, the payment was irregular.

[85] 1,21,657.59 cum x differential rate ₹ 80.60 per cum

1	2	3	4
MKVDC	**Pimpalgaon (Dhale) medium irrigation Project** (1) Extra lead charges for bringing materials (1,68,514 cum) for hearting zone and 1,12,200 cum for casing zone amounting to ₹ 57.88 lakh and ₹ 46.28 lakh respectively were approved (June 2001) as EIRL by the SE, Bhima Canal Circle, Solapur on the ground that the excavated material from the work site was not of appropriate quality.	Construction of earthen dam, ungate spillway, tail and head regulator of Pimpalgaon (Dhale) medium irrigation project M/s Patil and Company (Date of work order- March 1997)	It was stipulated in the contract that it would be the responsibility of the contractor to utilize the excavated material or arrange additional material at his cost, if enough material could not be excavated. Payment of ₹ 2.44 crore[86] as extra items was contrary to the provisions of the agreement. The Government stated (July 2013) that the excavated material was not of good quality for hearting and casing and cut-off trench. As a result, the remaining quantity was brought from outside the designated zone entailing extra lead. The reply is not acceptable as the quantity executed under EIRL was within the tendered quantity and it was the responsibility of the contractor to arrange the additional material at his cost.
	(2) SE, Bhima Canal Circle, Solapur sanctioned (October 2008) EIRL of ₹ 2.01 crore for obtaining the requisite material for rock toe, stone pitching and quarry spaul from another source on the ground that the material excavated from the work site was of poor quality.		
KIDC	**Roshani minor irrigation project** EIRL for ₹ 99.09 lakh was sanctioned for "manufacturing, providing and supplying spirally welded fabricated MS pipes".	Constructing earth work and CD work for Km 1 to Km 5 of Roshani RBC M/s R.N. Shinde (Date of work order - November 2007)	Sanction of EIRL was not justified as the item of work was already provided in the tender (item no. 17) resulting in avoidable expenditure of ₹ 27.66 lakh. The Government stated (July 2013) that tender item number 17 was for providing and supplying of pipes at work site. The item of erection of pipe was not considered in the estimates. Reply is not acceptable as rate analysis based on which estimates were prepared was inclusive of erection charges.
	Nardave medium irrigation project ₹ 22.33 crore was sanctioned (June 2009) as extra items by CE, Konkan Region in a 'C[87]' tender for controlled blasting (₹ 5.57 crore) and extra efforts for breaking boulders (₹ 16.76 crore).	Construction of Mohammadwadi medium project on turnkey basis M/s R.N. Nayak and Sons, Engineers and Contractors, Karnataka (Date of work order- May 1999)	The sanction of extra items and payment of ₹ 22.33 crore to the contractor was irregular as per Clause 18 (1) of the agreement, which prohibited such payments. The Government stated (July 2013) that sanction of extra items was required owing to site conditions *viz.* presence of houses in the vicinity of dam site and presence of boulders in the quarries. Reply is not acceptable as 'C' tender clearly prohibit the provision of extra items unless the scope of work is changed.

[86] Includes ₹ 1.04 crore as lead charges for material for casing and hearting + ₹ 1.40 crore for rock toe, stone pitching and quarry spaul, being the differential rate between tender and sanctioned rate in EIRL towards excavated material

[87] An all inclusive tender where execution is as per the contractor's own design

1	2	3	4
KIDC	**Korle-Satande medium irrigation project** The Irrigation Project Construction Division, Ratnagiri, proposed a single work for construction of 600 m tunnel work of Irrigation-Cum- Power Outlet (ICPO[88]). The Chief Engineer, Konkan Region WRD, Mumbai, sanctioned (April 2007) the execution of ICPO tunnel by splitting the work in two parts. First part involving construction of 300 m ICPO tunnel work was attached to the contractor executing canal work as EIRL and the other 300m ICPO tunnel work was awarded to the same contractor executing canal work, by tendering.	Construction of tunnel work for ICPO at chainage 300 m Premier Construction Company (Date of work order- February 2008)	The sanction did not specify any reasons for splitting of the work in two parts. An amount of ₹ 1.14 crore was paid on the work executed as EIRL and ₹ 2.10 crore paid to the contractor awarded through tendering. The Government stated (July 2013) that the work was split up to speed up its execution. Reply is not acceptable as attachment of ICPO work (being part of dam work) to contractor executing canal work was not justified and the complete work should have been tendered as one work instead of splitting it into two.

3.3.3 Irregular sanction of mobilisation advance to contractors

Audit observed that the Acts of MKVDC, GMIDC and TIDC did not provide for payment of interest bearing monetary advances to the contractors. In 37 cases, mobilisation advance of ₹ 478.95 crore was paid (February 2007 to October 2011) to 27 contractors, though the contract conditions did not provide for payment of such advances. The details are indicated in **Table 3.18**.

Table 3.18: Mobilisation advance granted to contractors **(₹ in crore)**

Name of the IDC	Mobilisation advance granted	No of contracts involved	Amount outstanding for recovery as on June 2013	Period of payment of advance
GMIDC	15.05	7	2.29	April 2007 to January 2010
VIDC	405.44	25	22.60	February 2007 to October 2010
KIDC[89]	42.96	3	23.07	April 2007 to October 2011
TIDC	15.50	2	0	October 2008
Total	**478.95**	**37**	**47.96**	
Source: Information furnished by the IDCs				

As of June 2013, an amount of ₹ 47.96 crore was pending recovery.

The Government stated (July 2013) that mobilisation advances were paid in exceptional circumstances for early start of work and as per the IDCs Acts and to speed up the works.

The reply is not acceptable as the provision for payment of mobilisation advances existed only in the Acts of KIDC and VIDC. Moreover, the tender/contract conditions did not provide for payment of mobilisation advances to the contractors. Further, no exceptional reasons were found adduced for the release of ₹ 478.95 crore as mobilization advance and this was an undue benefit granted to the contractors.

[88] An outlet for rerelease of water for irrigation purpose as well as power generation

[89] Mention was also made in the Audit Report (Civil) of the Comptroller and Auditor General of India for the year ended March 2009 regarding irregular sanction of advance amounting to ₹ 15 crore by KIDC to M/s F A construction in Shahi river project.

3.3.4 Non-recovery of royalty charges

The estimates for works involving use of material like metal, sand, murum *etc* are prepared by the division offices by including or excluding the element of royalty payable to the Revenue Authority. On failure to produce the challan by the contractors, royalty charges are recoverable from the contractors' bills. Audit scrutiny revealed that in six works royalty charges amounting to ₹ 5.72 crore were either not recovered or short-recovered. Details are shown in **Appendix 3.7**.

3.3.5 Non-recovery of insurance premium

As per the guidelines issued (19 August 1998) by the Finance Department, the contractors were required to get the work insured with the Director of Insurance, Maharashtra to the extent of cost of work awarded and produce the insurance papers to the Engineer-in-charge of the work. On failure by the contractors to insure the work, an amount equivalent to one *per cent* of the cost of work was to be deducted from the contractors' bills as insurance premium and remitted to the Director of Insurance, Maharashtra. In 13 cases, insurance premium amounting to ₹ 4.10 crore was not recovered, despite failure of the contractors to insure these works. The details are indicated in **Table 3.19**.

Table 3.19: Non-recovery of insurance premium by IDCs

Name of the IDC	No. of works	Non-recovery of insurance premium (₹ in crore)	Remarks
MKVDC	4	0.35	The Government stated (July 2013) that recovery would be made from the contractors' next bills.
GMIDC	5	0.41	The Government stated (July 2013) that in one case the contractor obtained the insurance policy. However, a copy of the policy was not provided to audit for verification. In the remaining four cases, the Government added that recovery would be made from the contractors.
KIDC	1	2.86	The Government stated (July 2013) that the record of the insurance policy from commencement of work will be verified and the recovery of the same would be done, if required.
VIDC	3	0.48	The Government accepted (July 2013) the observation and stated that recovery is being done.
Total	**13**	**4.10**	

Audit also noticed non- incorporation of an insurance clause in the contracts due to which the loss could not be indemnified. Some of the cases are illustrated below:

KIDC

The right and left flank of embankment of Korle-Satandi medium irrigation project constructed by the contractor slipped during 2007 and 2008 due to heavy rains. Additional work to reconstruct the slipped embankment at a cost of ₹ 3.68 crore was sanctioned (October 2009) by the CE, which included price escalation of ₹ 94.27 lakh. However, due to non-incorporation of insurance Clause in the contract, the loss of ₹ 3.68 crore could not be offset by WRD through insurance claim.

GMIDC

In four works under GMIDC, the contract did not include an insurance Clause. However, while fixing the rates for tender items where the quantities increased over 125 *per cent* of tender quantities under Clause 38, insurance cost was incorrectly included resulting in excess payment of ₹ 1.59 crore to the contractors. The Government stated (July 2013) that recovery would be made if the contractors fail to produce the insurance policies. The reply is not tenable because inclusion of insurance relating only to items where quantities increased beyond 125 *per cent* does not arise, as the original work was not insured.

VIDC

In VIDC, an amount of ₹ 2.38 crore was included in the estimates of three works on account of insurance charges. However, the amount of insurance premium paid for these works as noticed from the premium receipts submitted by the contractors was actually valued at ₹ 0.50 crore only. Thus, excess insurance charges of ₹ 1.88 crore included in the estimates rendered an undue benefit to the contractors to that extent. The Government stated (July 2013) that contractors were the lowest bidders and quoted considering actual insurance amount required. However, the justification of contractors for quoted tender rates was not provided in support of reply.

3.3.6 Undue benefit to contractors

3.3.6.1 Release of final bill pending recovery of excess payment

Construction of earthen dam, ungate spillway, tail and head regulator of Pimpalgaon (Dhale) medium irrigation project under MKVDC was entrusted to M/s Patil and Company at a cost of ₹ 9.28 crore (4.95 *per cent* above the estimated cost) in March 1997. The stipulated date of completion was March 2000. After incurring expenditure of ₹ 40.03 crore, the work was completed in September 2008.

As per Clause 55 (2) of the contract, where total quantity for excavation in soft and hard strata exceeds 125 *per cent* of the total tendered quantity, the excess quantity would be distributed in the ratio of quantity of individual item executed to total quantity executed and will be paid as per Clause 38 (2) of the contract. Audit observed that payment for excess quantity (beyond 125 *per cent* of the tendered quantity) on account of excavation in soft and hard strata was in contravention of tender Clause 55(2) which resulted in an excess payment of ₹ 1.79 crore to the contractor (November 2009). Anticipating recovery of excess amount by the project authorities, the contractor filed (December 2006) a Civil Suit in the District Court, Solapur. The District Court issued a stay order (August 2008) on the recovery of the amount till issue of final orders. In November 2008, the CE, Specified Projects directed the SE, Bhima Canal Circle to fix the responsibility and initiate disciplinary action against the officials concerned for non-invoking of tender Clause 55 (2) while determining excess quantity in excavation of soft and hard strata and payment thereof. However, there was no evidence on record to indicate that action was taken against the concerned officials**.**

Audit further observed that while the matter was still *sub judice*, EE, Minor Irrigation Division, Solapur paid (November 2009 and January 2010) ₹ 2.85 crore to the contractor towards his final bill and security deposit of ₹ 38.31 lakh was also refunded (April 2010 and November 2011) to the contractor thereby jeopardising the financial interest of the Department. The final order of the Court was awaited (July 2013).

The Government accepted (July 2013) the facts and stated that an explanation from the officers responsible was called for (December 2012) by CE (Specified Projects), Pune. Further action in this regard was awaited (October 2013).

3.3.6.2 Irregular payment of excess quantities

MKVDC accorded (February 2000) AA of ₹ 8.18 crore for construction of minor irrigation tank (MI tank) at Niwakne. In a review meeting held in May 2000, the Minister for Public Works suggested increase in height[90] of the dam on the demand by the local population. Accordingly, the revised estimates of ₹ 19.87 crore for the dam with increased height was submitted by the EE in May 2001, which was approved by MKVDC in June 2002.

Audit observed that even though the issue of increase in dam height was under consideration (May 2000), MKVDC awarded a lump sum contract 'C' tender to M/s Maruthi Civil Works, Navi Mumbai in June 2000 for construction of dam with original height of 37.80 meters at a total cost of ₹ 5.87 crore. However, approval of the revised estimates subsequently (for increase in dam height up to 50.80 metres) necessitated incorporation of excess quantities in the work after its award in June 2000. The award of work when increase in the height of the dam was under consideration was irregular. Moreover, increase in height of the dam on the demand of the local representative indicated that the stakeholders were not consulted before the project was awarded. Award of the 'C' tender before final decision to increase the height of the dam also resulted in increase in cost by ₹ 26.29 crore[91] up to June 2013.

3.3.6.3 Change in contract condition

Work order of ₹ 185.03 crore (DSR of 2000-01)[92] for construction of Mumari dam (under Bhatsa irrigation project of KIDC) was issued (February 2009) to M/s Noble India Construction Company to be completed in 60 months. As per tender conditions, the payment for price variation was to be regulated based on the price index of three components[93] prevailing in the month preceding the month in which the work actually commenced.

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90 As per AA: 37.80 meter; Revised height: 50.80 meter as decided in the review meeting held in May 2000

91 Being the difference of expenditure up to June 2013 *i.e.* ₹ 34.47 crore less cost of original AA *i.e.* ₹ 8.18 crore

92 Though the estimates were prepared based on DSR 2000-01, the work on the project was not taken up as acquisition of forest land was pending. After in-principle approval for forest land by MoEF in July 2008, tenders were invited and work order was issued in February 2009

93 Material, labour and petrol, oil and lubricants

Audit observed that upon request of the contractor (May 2010), KIDC renegotiated the contract for ₹ 173.03 crore and issued a revised work order (June 2010)[94] by amending[95] the original price variation clause, which was likely to render substantial financial benefits to the contractor. The revision of price variation clause subsequent to issue of work order violated the principles of equity in tendering and resulted in undue favour to the contractor as the clause was not known to other bidders and the change was made subsequent to bidding procedure and issue of work order. As of November 2013, the work has not commenced due to non acquisition of forest land.

The Government stated (July 2013) that revised negotiations were done after removing the earlier condition in price variation and the contractor's new offer was much lower than his previous offer. The Government further stated that provision for balance net present value of ₹ 34.53 crore was made in the budget for 2013-14 and work would start after payment of this amount to the Forest Department. The reply is not acceptable as post-award negotiations vitiated the tendering process and KIDC should have retendered the work in order to obtain competitive rates. Further, award of work without acquisition of forest land also contravened paragraph 251 of the MPW Manual.

3.4 Monitoring

3.4.1 Internal control mechanism

Internal control is an integral component of an organisation's management process. It is intended to give a reasonable assurance to the management that the operations are carried out according to laid down rules and regulations in promoting orderly service consistent with the organisation's mission.

3.4.2 Monitoring by the Governing Council

The GC of the IDCs functions as the monitoring body to review the financial and physical progress of the projects on behalf of each IDC. The IDCs were required to convene meetings once in a month as per Clause 7(1) of respective IDC Acts. The Minister of Water Resources Department is the Chairman of the GC and the Secretaries Finance, Revenue and Forest and Planning departments are the *ex-officio* members of the GC.

Further, as per Governor's Directives dated 15 December 2001, one member from the Regional Development Boards (Rest of Maharashtra, Marathwada and Vidarbha) was to be the part of GC so as to ensure equitable and balanced regional development. GoM issued directives (December 2003) for appointment of members of respective Development Boards in GC of IDCs.

Details of meetings conducted in various IDCs and shortfalls are discussed in the **Table 3.20**.

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[94] The date of completion was same as the original work order

[95] As per the amended Clause, the contractor was expected to get the benefit of escalation between the base index of the quarter preceding the month in which the tender was accepted (December 2008) and the month preceding the month in which the work actually commenced

Table 3.20: Status of GC meetings to be held *vis-a-vis* actually held

IDCs	No. of meetings required to be held as per norms/ Meetings actually convened	Remarks
1	2	3
MKVDC	206 (1996 -2013)/ 75	It was noticed that issues such as preparation of long term and annual plans for completion of irrigation projects, constraints in completion of projects were not discussed in the GC meetings. The Chief Secretary, Secretaries of RFD (Relief and Rehabilitation), Finance Department, Planning Department and Agriculture Department, who were the members of GC never attended the meeting held during 2007-08 to 2011-12. In the second meeting of the GC held in June 1996, an important decision regarding delegation of powers to accord AAs to ED was taken. The meeting was however, attended by only six out of 22 members. The MKVDC also did not frame rules as per the Act specifying the quorum for the meeting.
GMIDC	174 (1998-2013)/ 50	There was no discussion on preparation and implementation of long term and medium term plans to speed up the creation of IP and its effective utilisation. The GMIDC also did not frame rules as per the Act specifying the quorum for the meeting.
VIDC	192 (1997-2013)/ 52	The *ex-officio* members from financial institutions, Legislative Assembly/Council did not attend any of the meetings. Absence of key members in GC meetings defeated the purpose of establishment of an effective monitoring system.
KIDC	180 (1998-2013)/ 55	It was seen from the annual reports of KIDC that no members of concerned Development Board (Board for rest of the Maharashtra) were included in the GC of KIDC, except for the period from 16 October 2006 to 16 October 2008.
TIDC	183 (1998-2013)/ 44	There was no discussion on preparation and implementation of long term, medium term and annual plans to speed up the creation of IP and its effective utilisation.
	935/ 276	

Audit observed that monitoring and internal controls in WRD was weak as the projects were executed without obtaining environmental and forest clearances; issues relating to rehabilitation of PAPs were not adequately addressed; and project and contract managements were deficient, leading to time and cost overruns. Further, rampant increase of arrears in collection of water charges (**Paragraph 6.2**) was another indicator of weak internal controls in the Department. No norms for site visits by Controlling Officers (Executive Director, Chief Engineer and Superintending Engineer) were fixed and the adequacy of monitoring and supervision conducted at various supervisory and controlling levels could not be ascertained. Compliance to the inspection notes of the Quality Control Organisation on the construction works was also poor.

The Management Information System was poor. The data furnished in Water Account[96] of individual irrigation projects are compiled in Irrigation Status

[96] Water Account is the primary data of a project prepared by the Division executing the project and containing information about the water storage, its utilisation and balance existing as on end of June each year

Report (RISR) of the region, which further gets compiled in the ISR[97] of the State. However, there were discrepancies in the number of projects, IP created, IP utilized, designed storage, actual storage and use of water in RISR and ISR, apart from discrepancies in the number of projects indicated in ISR and that indicated in the Economic Survey Reports (**Appendix 3.8)**.

The Government stated (July 2013) that the meetings of GC were held as and when the issues concerned with the GC arose. The fact remained that the provisions of the Act for holding monthly meetings was violated by all the five IDCs.

Regarding MIS, the Government stated (August 2013) that the matter is being examined and the figures will be reconciled.

3.4.3 Role of Maharashtra Water Resources Regulatory Authority

As already pointed out in paragraph 2.2.1, Section 21 (1) of the MWRRA Act, 2005 vested the Authority with special responsibility for removal of irrigation backlog as per the Governor's directives. In addition, the powers and functions of MWRRA as per Section 11 of the MWRRA Act, 2005 were to:

a) determine the distribution of entitlements (quantum of water) for various categories of use (sectoral allocation amongst agriculture, drinking and industrial) and the equitable distribution of entitlements of water within each category of use on such terms and conditions as may be prescribed;

b) enforce the decision or orders issued under the Act;

c) determine the priority of equitable distribution of water available at the water resource project, sub-basin and river basin levels during periods of scarcity;

d) establish a water tariff system and to fix the criteria for water charges at sub-basin, river basin and State level after ascertaining the views of the beneficiary public, based on the principle that the water charges shall reflect the full recovery of the cost of the irrigation management, administration, operation and maintenance of water resources project; and

e) administer and manage interstate water resources apportionment on river systems of the State.

In this connection Audit observed that:

- MWRRA did not determine the sectoral allocation of water though empowered under the Act (refer (a) above) and the High Power Committee (HPC) constituted earlier in January 2003 headed by the Minister, Water Resources continued to determine the sectoral allocation up to January 2011. Thus, an important function envisaged in the Act was not exercised by MWRRA despite a lapse of six years of its establishment. In April 2011, the MRRWA Act, 2005 was amended and the role of the HPC constituted by GoM in January 2003 allocating water to any person or a water user entity was recognised under the Act. The

[97] Annual report showing status of live storage in the reservoirs as on 15 October, total yield and utilisation of water, IP utilised from project canals, wells, river/nallas, the season and crop-wise utilisation of IP during the irrigation year *etc.*

amended Act further provided that the GoM would be responsible[98] for the sectoral allocation of water. The amendment was made effective retrospectively from June 2005, when MWRRA came into existence. It can thus, be seen that the responsibility of MWRRA for sectoral allocation of water was first taken over by the HPC and subsequently, ratified by an amendment, its functions were taken over by the GoM.

- The original powers conferred on the MWRRA enabled it to determine the entitlements for various categories of use for the entire river basin. However, the amendment to the Act in April 2011 restricted the jurisdiction of MWRRA to determine the entitlements to such area as delineated by the Maharashtra Management of Irrigation System by Farmers (MMISF) Act, 2005, where water is to be provided to the water users' association through public canal system.
- MWRRA did not determine the priority of equitable distribution of water during periods of scarcity. As per the draft Rules to the Act proposed by GoM (August 2012), the powers to determine equitable distribution of water during scarcity, after meeting drinking water requirements, was to be decided by the river basin agencies *i.e.* the IDCs. In the exit conference (July 2013), the Principal Secretary, WRD, stated that the process of determining equitable distribution of water during scarcity has been started.
- The Authority fixed the bulk water tariff for irrigation, industrial and domestic consumption with effect from May 2011 *i.e.* after a period of more than six years of its constitution.

The MWRRA thus, failed to perform its role as a regulator, as the envisaged major functions were not exercised by it.

3.4.4 State Level Technical Advisory Committee

In accordance with the State water Policy of 2003, the GoM restructured the WRD in October 2010 and constituted a State Level Technical Advisory Committee (SLTAC) consisting initially of four[99] members. The SLTAC was to scrutinize proposals valuing ₹ 25 crore and above pertaining to AA and RAA of water resources projects (prior to constitution of SLTAC, the proposals were scrutinized by GoM).

In order to facilitate expeditious clearance to AAs/RAAs related to the Minor Irrigation (MI) projects, the GoM, as per directions of the GoI (December 2010), included in October 2011 the CE, Local Sector and the Regional CE of the concerned projects and the representative of Central Water Commission for the projects under AIBP as invitees to the SLTAC. Further, the Director (Monitoring) CWC, Nagpur was also included (May 2012) as the member of SLTAC for the MI projects under AIBP.

Audit observed the following:

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[98] By adding Section 16 A to the MWRRA Act, 2005 in the said amendment of April 2011

[99] Director General DTHRS, Nashik; CE DTHRS, Nashik; CE Planning and Hydrology, Nashik; SE Data Collection, Planning and Hydrology, Nashik

- The GoM took almost a year, after issue of GoI directives, to include the representative of the CWC as a member.
- GoM did not prepare any Rules/Manuals for the SLTAC. As such, the scrutiny of the documents received along with proposals was being done by the SLTAC without any prescribed guidelines.
- Though SLTAC was established in October 2010, the time limit for clearance of AAs and RAAs of the projects (34 days; including holidays) was stipulated by GoM only in September 2011. Scrutiny revealed that of the 81 proposals received between January 2011 and December 2011, the SLTAC cleared 27 proposals after a period ranging from 45 to 394 days. The SLTAC attributed the delays in clearance of proposals to delay in receipt of full and final compliance to the queries raised by them from the field offices.

Chapter 4

Dam Safety and Quality Control

Chapter 4

Dam Safety and Quality Control

4.1 Introduction

The safety of dams is an important issue that needs to be continuously monitored for ensuring public safety, protection of downstream areas from potential hazard and ensuring continued accrual of benefits from the assets created. As of December 2012, there were 1,913[101] large[102] completed dams in the State. GoM had prescribed schedule for inspection of dams to ensure their maintenance and safety and constituted (March 1985) a Dam Safety Organisation[103] (DSO) for dam safety monitoring. For quality assurance in dam construction, Quality Control Organisation and Maharashtra Engineering Research Institute (MERI) were established.

4.2 Inspection of dams

GoM issued (February 1962) detailed instructions which were reiterated in January 1982 for inspection of all the completed irrigation projects by the Executive and Superintending Engineers at Division and Circle levels to ensure requisite standards of maintenance and safety. It was also instructed (February 1962) that repairs and improvements indicated through such inspections should be attended to at the earliest. As per the Government instructions, inspection reports are to be submitted by EE and SE to the regional CE with a copy to the SE, DSO by 31 December each year. On the basis of these inspection reports and regular test inspections carried out by DSO, an annual Health Status Report[104] (HSR) of the dams is prepared. The responsibilities of the DSO are as under:

- Test inspections of large dams, scrutiny of pre and post-monsoon inspection reports received from field offices and to suggest remedial measures for significant and important deficiencies;
- Monitor the periodical inspection of dams carried out by the field officers;
- Prepare annual HSRs of dams in the month of March for submission to Central Water Commission (CWC) and GoM;

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101 As per the latest Health Status Report of 2012

102 Large dam: Having height above 15 m from the lowest portion of the general foundation arc to the crest above or if a dam having height of 10 to 15 m it should satisfy at least one of the conditions *viz.* (a) length of the crest not less than 500 m; (b) reservoir capacity not less than one million cubic meter (c) flood discharge capacity not less than 2,000 cubic meter per second; (d) dam having specially difficult foundation problem and (e) unusual design

103 'Dam Inspection and Safety Services' established in October 1980 was renamed as 'Dam Safety Organisation' in March 1985

104 An annual report to be prepared by the DSO in March every year and to be sent to the Regional Chief Engineers and concerned Superintending and Executive Engineers in-charge of dams, State Government and Dam Safety Monitoring Unit of Central Water Commission, New Delhi

- Carry out the analysis of instrumentation data received from the field and prepare Instrumentation Analysis Report (IAR) for inclusion in the HSR; and;
- Prepare inventory of the register of large dams and compilation of district- wise registers of small dams.

Audit scrutiny revealed delays in inspection of dams and non-compliance to the deficiencies pointed out in the HSR. The same are discussed below.

4.2.1 Dams not inspected for more than 10 years

Large dams were classified (December 1988) by the DSO as Category I, II and III for the purpose of conducting periodical inspections based on the parameters as given in **Table 4.1**.

Table 4.1: Classification of dams

Sr. No.	Category	Parameters			
		Height over lowest foundation (metres)	Gross storage (Million cubic metre)	Spillway capacity (cum/Sec)	Type of spillway
1	Category I	More than 30	More than 60	More than 3000	Gated
2	Category II	15 to 30	15 to 60	2000 to 3000	Un-gated
3	Category III	10 to 15	1 to 15	2000 to 3000	Un-gated
Source: Information furnished by DSO					

The DSO on the basis of pre and post-monsoon inspection reports received from field officers and test inspections of Category I and II dams conducted, prepares an annual consolidated HSR of Category I and II dams. The HSR also suggests remedial measures to be taken for the deficiencies pointed out in the report. The status of inspection of dams conducted by the DSO is given in **Table 4.2**.

Table 4.2: Test inspection of dams by DSO

Year	Number of category I and II dams	Number of dams test inspected by DSO	Percentage of inspection
2007	1679	191	11.38
2008	1713	180	10.51
2009	1762	155	8.80
2010	1763	178	10.09
2011	1878	174	9.27
2012	1913	168	8.78
Source : Health Status Reports			

The above table reveals that the number of dams inspected decreased from 11.38 *per cent* in 2007 to 8.78 *per cent* in 2012[105].

Audit observed that GoM did not issue any instructions fixing the frequency of inspection for each dam by the DSO as also the methodology for selection of dams for test inspection by the DSO. However, DSO while preparing the annual inspection programme, selected a dam by adopting three criteria *viz.* dams not inspected for the last 10 years, demands of CEs of field offices to conduct inspection of dams under their jurisdiction and dams having Category I deficiency[106] in the previous year.

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[105] Health Status Report prepared up to the year 2012 only

[106] Categories of the deficiencies defined by DSO: Category I deficiencies: Deficiencies which may lead to failure of dam; Category II deficiencies: Major deficiencies requiring prompt remedial measures; and Category III deficiencies: Minor deficiencies which are rectifiable during the year

However, audit noticed that the DSO did not follow the above criteria for selection of dams for test inspection. At the end of March 2013, there were 348 dams (29.72 *per cent*) which were not inspected for more than 10 years, as detailed in **Table 4.3**.

Table 4.3: Dams not inspected for more than 10 years

Sr. No.	Region	Number of dams		Total	Number of dams not inspected for last 10 years		Total dams not inspect-ed	Percentage of dams not inspected for last 10 years		
		Category I	Category II		Cate-gory-I	Cate-gory-II		Category I	Category II	Total
								(9)	(10)	(11)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(6/3) *per cent*	(7/4) *per cent*	(8/5) *per cent*
1	Konkan	41	131	172	08	84	92	19.51	64.12	53.49
2	Pune	69	205	274	00	29	29	--	14.15	10.58
3	Nashik	65	179	244	07	56	63	10.77	31.28	25.82
4	Auranga-bad	15	212	227	03	102	105	20.00	48.11	46.26
5	Amravati	20	155	175	03	56	59	15.00	36.13	33.17
6	Nagpur	19	60	79	0	0	0	0	0	0
Total		**229**	**942**	**1171**	**21**	**327**	**348**	**9.17**	**34.71**	**29.72**

Source: Data furnished by DSO

From the above table it may be seen that nine *per cent* of Category I and 35 *per cent* of Category II dams were not inspected for more than 10 years. Further, 52[107] dams which were originally identified in the annual inspection programmes approved by the Director General, DTHRS[108] during the period 2007-08 to 2010-11, were neither inspected nor included in the subsequent annual inspection programmes. The deviation from annual inspection programmes was also not approved in the subsequent annual meetings of Director General, DTHRS.

There was thus, a need to fix the frequency or periodicity of inspection of each dam and also formulate a suitable selection criteria for inspection of dams based on age, size and the potential risk they may pose to life and property in case of failure.

The Government stated (August 2013) that dams which were originally identified in the annual inspection programme but not inspected have been incorporated in the annual dam inspection programme for 2013-14. Verification of inspection programme for 2013-14 revealed that out of the 52 dams not inspected during 2007-11, 44 dams were included in the inspection programme for 2013-14.

4.2.2 Poor compliance to deficiencies pointed out in health status report of dams

The field offices are responsible for taking remedial measures on priority basis before onset of monsoon and submit compliance reports on the deficiencies to the DSO before preparation of succeeding year's Health Status Report.

[107] Includes one dam *viz.* Ambit which was identified twice for inspection during 2009-10 and 2010-11, but not inspected

[108] Design, Training, Hydrology, Research and Safety

Audit analysis of the HSRs for the years 2007 to 2012 revealed that the HSRs prepared by the DSO excluded the status of 90[109] dams, as pre and post-monsoon inspection reports had not been received. Thus, the annual HSRs did not reflect the true health of Category I and II dams.

While Category I deficiencies were not noticed in any dams, the status of compliance to Category II deficiencies pointed out in earlier years, as per HSRs, is indicated in **Table 4.4**.

Table 4.4: Status of compliance to Category II deficiencies

Year of HSR	Number of dams with category II deficiencies	Number of dams for which compliance received till finalisation of succeeding year HSR	Compliance percentage
2007	450	3	0.67
2008	459	47	10.24
2009	583	71	12.18
2010	508	50	9.84
2011	522	101	19.35
2012	493	216	43.81
Source: Health Status Report of dams of respective years			

As can be seen, compliance was low and ranged between less than one *per cent* and 43.81 *per cent* during 2007-12.

Audit also observed that compliance reports of Category II deficiencies mentioned in the HSRs for the year 2007 to 2012 were not received from Marathwada region as a result in Marathwada region non-compliance to Category II deficiencies increased progressively from 52 in 2007 to 68 in 2012. Some of the deficiencies for which compliances were pending are shown in **Appendix 4.1**.

A few instances where lack of action resulted in aggravation of deficiencies are given below:

- In five[110] dams, the rate of seepage in gallery and leakage of water noticed during initial inspection in 2007 increased from three *per cent* to 130 *per cent* during 2012.
- At Manjara dam, the cross drains[111] and toe drains[112] were blocked in 2007 but by 2011 the cross drains and toe drains were de-shaped.
- At Mun dam, the right and left side guide bunds[113] required rectification in 2007 but due to non-rectification, the earthwork of guide bund and pitching at river distance 210 m to 300 m was washed out in 2011.

The DSO stated (October and November 2012) that follow up was done through correspondence with the field offices at all levels and the matter was also discussed in the annual meeting of Regional Chief Engineers under the

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109 2007: 17 dams; 2008: 22 dams; 2009: 13 dams; 2010: 10 dams; 2011: 16 dams and 2012: 12 dams

110 Kolkewadi – 3 *per cent*; Tillari Main Dam, Dhamne (G) – 51 *per cent*; Bhatsa – 66 *per cent*; Awashi – 67 *per cent* and Wagh – 130 *per cent*

111 Cross drain is to collect seepage from the longitudinal drain and collect it in the toe drain

112 Toe drain is a trench with filter material laid along the down stream toe of the dam to collect seepage from horizontal filter or inner cross drain and take it to natural drain

113 Guide bunds are provided for the purpose of guiding the river flow past the diversion structure without causing damage to it and its approaches

Chairmanship of Director General, DTHRS. The fact remains that despite the correspondence and meetings, the Category II deficiencies remained unattended thereby compromising the safety of the dams.

The Government stated (August 2013) that a system would be put in place to rectify the reported deficiencies for ensuring proper accountability.

4.3 Quality checks by Maharashtra Engineering Research Institute

MERI was established in April 1959 at Nashik for research, investigation, testing of material and consultancy in various disciplines of civil engineering. MERI is headed by Director General, DTHRS, who is assisted by CE, SE and nine Ees. Audit findings are discussed in the succeeding paragraphs.

4.3.1 Absence of mechanism to ensure testing as per norms

Material Testing Division (MTD) of MERI conducts various tests on the samples of material such as cement, core of colgrout masonry[114] *etc.* received from dam construction divisions and results are intimated to the concerned dam divisions. As per the norms fixed (April 1993) by GoM, the dam divisions were required to get one cement test done by Quality Control Divisions (QCD) of WRD for every 50 tonnes of cement used in the work. Further, from April 2000 onwards, minimum 10 *per cent* samples of cement were required to be tested by MERI. In five[115] test-checked projects, audit scrutiny revealed that against 44 samples to be sent for testing to MERI during 2007-13, only four samples were sent by the construction divisions.

The Government stated (August 2013) that a system already exists in the Department to ensure that the required number of samples are received and tested as per norms.

However, in view of the shortfalls in testing noticed in audit, the Department needs to ensure adherence to the prescribed norms so that necessary quality norms are adhered to.

4.3.2 Failure of colgrout masonry samples during quality test conducted by MERI

The test to be conducted on colgrout masonry is prescribed in the PWD hand book whereby for every 10,000 cum of colgrout masonry constructed during the season, the dam divisions should get one core tested from MERI. After receipt of samples from the project divisions, tests are carried out and results are communicated to the divisions.

Scrutiny of test reports of colgrout masonry works conducted by MTD during the period 2007-2013 revealed that samples in respect of 12 out of 15 projects failed. The results in respect of the nine projects are shown in **Table 4.5**.

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[114] Colgrout masonry is a new technique where the masonry is the result of injection of mortar consisting of mixture of cement, fine aggregate and water and additives, if any, mixed at high speed in a colgrout double drum mixer in pre-packed stones

[115] Dendonwadi, Hetwane, Korle-Satandi, Nardave and Roshni

Table 4.5: Results of colgrout core tests

Sr. No.	Name of the project	No. of samples			
		Received	Passed	Failed	Percentage of failure
1.	Rankala Minor Irrigation Project, District Nandurbar	02	01	01	50
2.	Bembala Project, District Yevatmal	04	00	04	100
3.	Uppar Mannar Project, District Nanded	03	01	02	66.67
4.	Kalu Minor Irrigation Project, District Ahmednagar	04	00	04	100
5.	Gul Project, District Jalgaon	02	01	01	50
6.	Lower Panzara Project, Akkalpada, District Dhule	11	06	05	42.86
7.	Urmodi Project, District Satara	02	01	01	50
8.	Uppar Pravara Project Nilwande 2, District. Ahmednagar	48	34	14	29.16
9.	Tarali Project Patan, District Satara	60	14	46	76.67
10.	Pimpalgaon Dhole Project, Taluka Barshi, District Solapur	05	02	03	60.00
11.	Lower Tapi Project, Taluka Pedalse, District Jalgaon	02	00	02	100.00
12.	Hatnur Project, Taluka Bhusaval, District Jalgaon	09	07	02	22.22
Source: Test report of MTD					

The failure of samples tested ranged between 22.22 *per cent* and 100 *per cent.*

On being pointed out in audit, the Supertindent Engineer, Central Design Organisation (CDO), Masonry Dam Circle confirmed (December 2012) that the low strength of the colgrout masonry works may lead to reduction in the strength of the dam to sustain load or stress in future.

4.3.3 Non-functional dam safety instruments

Various types of instruments[116] are installed in dams having more than 30 m height to monitor their health and ensure proper diagnosis for implementation of remedial measures. Instrumentation Research Division (IRD) of MERI looks after the procurement, installation and repairs of dam safety instruments.

Scrutiny of instrument analysis report in the HSR for the year 2007-12 revealed that a large number of instruments were not functioning. The status of the instruments installed on earthen and masonry dams for the period 2007-12 is shown in **Table 4.6**.

Table 4.6: Instruments installed and their functional status

Year of HSR	Type of dam	Instruments		
		Installed	Functioning	Not functioning (Percentage)
1	2	3	4	5
2007	Earthen	2378	1238	1140 (47.94)
	Masonry	1410	913	497 (35.25)
2008	Earthen	2378	1225	1153 (48.49)
	Masonry	1617	1103	514 (31.79)
2009	Earthen	2396	1113	1283 (53.55)
	Masonry	1572	1114	458 (29.13)
2010	Earthen	2396	1098	1298 (54.17)
	Masonry	1650	1140	510 (30.91)

[116] Stress meter, strain meter, thermometer, piezometers, plumb bobs, seismic instruments, micro earthquake recorder, strong motion accelerograph *etc.*

1	2	3	4	5
2011	Earthen	2048	898	1150 (56.15)
	Masonry	1595	916	679 (42.57)
2012	Earthen	2669	1510	1159 (43.42)
	Masonry	1667	943	724(43.43)
Source: HSRs prepared by DSO for the period 2007-12				

As seen from the table above, the overall percentage of the instruments installed and not functioning ranged between 29 and 56 *per cent*. The percentage of non-functioning instruments installed in earthern dams showed a consistent increase of 47.94 *per cent* in 2007 to 56.15 *per cent* in 2011. In respect of masonry dams, though the percentage of non-functioning instruments decreased from 35.25 *per cent* in 2007 to 29.13 *per cent* in 2009, but thereafter continued to increase sharply and was 43.43 *per cent* in 2012.

- An inverted plumb bob (IPB) provides an effective, simple and quick method of measuring the relative deplacement between two reference points of dam structure. Audit scrutiny revealed that IPB in Pench (Totaladoh) dam and Manikdoh dam were not working since June 2010 and September 2011 respectively.The IRD prepared estimates of ₹ 1.79 lakh for Pench project and ₹ 2.06 lakh for Manikdoh project and forwarded them to the project authorities concerned for remitting the cost of repairs. However, the instruments could not be repaired by IRD due to non remittance of funds by the Manikdoh construction division (October 2013). Similarly, DG, MERI, Nashik intimated (February 2008) SE, North Konkan Irrigation Circle, Thane that the inverted plumb bob installed in Bhatsa dam was not functioning. Though an estimate of ₹ 3.13 lakh was prepared by MERI Nashik in March 2010 for the repairs, this could not be carried out due to non remittance of funds by Bhatsa construction division (October 2013). Due to non-functional IPB, the tilt in dams could not be measured and monitored.

The Government stated (July 2013) that funds available for maintenance of dams was limited and hence, repairs were done after due prioritisation. It further stated that repairs/replacements of all the defective instruments would be undertaken if special arrangements for funds are made, either by the Central Government or from any other sources. As the cost of repairs of these non-functoning IPB is very small compared to the huge revenue expenditure made annually, Government may ensure that these defective instruments are repaired at the earliest to allow the monitoring of the health of the dams which could lead to disaster if unattended to at the earliest.

4.4 Quality checks through Quality Control Organization

WRD created a separate Quality Control Organization (QCO) with three Quality Control Circles (QCC) at Pune (1979), Aurangabad (May 1999) and Nagpur (August 2009) for testing of material used in dam construction, concrete/cement mortar cubes for compressive strength and field density and moisture content tests for embankment. The EEs of the Construction Divisions (CD) were to send copies of the technical specifications of the accepted tenders and work orders (issued to the contractors) to the respective quality control engineers before the start of work so that the programme for quality

tests could be prepared accordingly by the QCD. A system of OK Card/Green Card was also introduced for works valuing more than ₹ three crore where the height of canal embankment was more than three metres and the cost of canal structures was more than ₹ one crore.

Senior officers visiting the construction sites were to scrutinize the works and point out discrepancies / errors through 'Inspection Notes' (INs). During inspection, if the deficiencies noticed were such as could be rectified before start of work, the QC officer would issue 'Yellow Inspection Slip' (YIS). If the deficiencies were of serious nature and it was not desirable to continue the work, the Deputy Engineer, QC was to issue 'Red IS' (RIS) with remarks. On receipt of RIS from QC, the work was to be stopped by the Construction Deputy Engineer (CDE) and necessary rectification carried out immediately. On rectification of the deficiencies raised in RIS, OK card is issued.

Audit scrutiny revealed that though the system was well defined, there were weaknesses in its implementation. Audit findings are discussed below.

4.4.1 Failure to obtain construction programme and execution of work without OK card/Green card

Every year the QCD requests the construction divisions to send the schedule of construction for that particular construction year (October to September) so that the programme for quality tests could be prepared by the QCD. Scrutiny of records of SE, QCC, Aurangabad, Nagpur and Pune in October 2012 revealed that 42 *per cent* CDs failed to furnish construction programme as detailed in **Table 4.7**.

Table 4.7: Shortfalls in sending construction programmes

Year	Name of the circle	Number of CDs		
		under the jurisdiction of Circle	which sent the construction programme	which failed to send the construction programme (*per cent*)
2009-10	Aurangabad	68	39	29 (43)
	Nagpur	49	35	14 (29)
	Pune	49	24	25 (51)
2010-11	Aurangabad	68	40	28 (41)
	Nagpur	54	30	24 (44)
	Pune	71	51	20 (28)
2011-12	Aurangabad	68	37	31 (46)
	Nagpur	51	27	24 (47)
	Pune	73	48	25 (34)
2012-13	Aurangabad	68	35	33(49)
	Nagpur	51	31	20(39)
	Pune	66	33	33(50)
	Total	**736**	**430**	**306 (42)**

Source: Information furnished by QCCs

In the absence of the construction programme, the QCD could not prepare programme for quality tests.

4.4.2 Completion of works despite issue of "Red IS"

Out of 2,807 works in the three Quality Control Circles (Aurangabad, Nagpur and Pune) for which construction programme were received during 2009-13,

in 2,532 works YIS were issued and in 81 works RIS were issued. Out of 81 works for which RIS were issued, 30 works were continued without obtaining OK cards.

Scrutiny of records of the EE, Minor Irrigation Division (MID), Satara further revealed that SE, QCC, Pune issued (June 2011) RIS to Kalgaon dam work in view of poor quality of earthwork (hearting and casing), non-execution of compression work (hearting and casing) *etc*. EE, MID, Satara submitted (September 2011) the compliance but it was not accepted (July 2012) by the SE, QCC. However, recordings in the measurement book (between 28 November 2011 and 30 January 2013) and bills paid (between December 2011 and February 2013) to the contractor indicated that the work was executed contrary to the instructions that work should not continue. The continuation of work and release of payment after the issue of RIS defeated the very purpose of quality control measures put in place.

In the exit conference, Principal Secretary stated (July 2013) that instructions would be issued for strict compliance to RIS.

4.4.3 Non-compliance to inspection notes issued by QCO

The WRD issued (September 1988) instructions to the construction divisions to comply with the technical remarks raised by QCO and to keep record of the compliances. The WRD also instructed (January 1998) that the Construction Superintending Engineer shall call the Executive Engineer, Quality Control for monthly meeting with the Construction Executive Engineer for speedy settlement of objections contained in the inspection notes.

Scrutiny of records of the SE, QCCs at Aurangabad, Nagpur and Pune revealed that out of 5,991 inspection notes issued during 2009 to 2013, 2,411 inspection notes were outstanding (40 *per ce*nt) as shown in **Table 4.8**.

Table 4.8: Outstanding inspection notes

Year	Name of the circle	No. of IN issued	Compliance received	Pending compliance	Pending compliance in *per cent*
1	2	3	4	5	6
2009-10	Aurangabad	501	268	233	47
	Nagpur	667	341	326	49
	Pune	142	89	55	39
	Total	**1310**	**698**	**614**	**47**
2010-11	Aurangabad	576	270	306	53
	Nagpur	645	382	263	41
	Pune	228	139	100	44
	Total	**1449**	**791**	**669**	**46**
2011-12	Aurangabad	824	361	463	56
	Nagpur	823	734	89	11
	Pune	186	91	109	59
	Total	**1833**	**1186**	**661**	**36**

1	2	3	4	5	6
2012-13	Aurangabad	632	342	290	46
	Nagpur	639	539	100	16
	Pune	128	59	77	60
	Total	**1399**	**940**	**467**	**33**
Grand total		**5991**	**3615**	**2411**	**40**
Source : Information furnished by QCO **Note**: Compliance received also includes compliance for the inspections notes issued in the previous years					

It was further observed that in Pune Circle, meetings for speedy settlement of objections, as envisaged in the Government circular of January 1998, were not held till August 2011. Thereafter, 16 meetings were held till September 2013. The fact that timely meetings were not held and the high pendency of the inspection notes indicated poor monitoring by the QCO. The SE, QCC, Pune stated (October 2012) that though pursuance was done at all levels through discussions, the compliances received from the construction divisions were vague and incomplete.

The high pendency of inspection notes and the reply of SE, QCC indicates that the field construction offices did not give due importance to quality control during the construction of the dams.

4.4.4 Shortfalls in inspections

Inspection norms for SEs, EEs *etc* as per the Manual prepared by Pune QCC are given in **Table 4.9**.

Table 4.9: Norms for conducting inspection **(in numbers)**

Designation	2007	2008	2009	2010	2011	Since November 2011
Superintending Engineers	12	12	20	25	25	35
Executive Engineers	14	16	22	30	30	40
Sub Divisional Engineers	30	30	30	30	30	40
Assistant Engineers II/ Sectional Engineers	300 slips/sub-division	300 slips/sub-division	300 slips/sub-division	300 slips/sub-division	400 slip/ sub-division	100 slip/sub-division
Source : Information furnished by the Department						

Shortfall noticed in audit with reference to the above norms in Pune Circle during 2007-13 is detailed in **Table 4.10**.

Table 4.10: Shortfall noticed in inspections under Pune Circle during 2007-13

Designation	Audit observation
Executive Engineers	The shortfall ranged between 6.25 *per cent* in Shirur division (2008) and Kolhapur division (2007) and 33.33 *per cent* in Shirur Division (2007).
Sub Divisional Engineers	Shortfall ranged between 3.33 *per cent* (2007) in Nasrapur Sub Division under Kolhapur Division and 86.66 *per cent* (2007) in Mohol Sub- Division under Shirur Division.
Asstt. Engineers/Jr Engineers/Sectional Engineers	Shortfall ranged between 1.5 *per cent* (2011) in Sub division No.2 Satara and 91.33 *per cent* (2008) in Mahuli (Vita) Sub-Division, Satara.
Source : Information furnished by the Department	

SE, QCC, Pune attributed the shortfall to fund problem and shortage of technical staff.

In Nagpur and Aurangabad QCCs, it was observed that the Manual stipulating the inspection schedule was not prepared by the respective QCCs. However, as per GoM instructions of August 2002, the SEs, QCCs was required to carry out average 10 days inspections of works per month (*i.e.,* 80 days of inspections *per annum* excluding four months of monsoon) subject to availability of ongoing works. The status of inspections carried out by SEs, QCCs during 2009-10 to 2012-13 against the norms specified is given in **Table 4.11**.

Table 4.11: Details of inspection carried out by SEs, QCCs

Sr. No.	Year	No. of days of inspection to be carried out by SE, QCC	Actual no. of days of inspections carried out by SE, QCC	
			Aurangabad	Nagpur
1.	2009-10	80	84	34
2.	2010-11	80	62	38
3.	2011-12	80	66	40
4	2012-13	80	53	49
Source : Information furnished by the Department				

The SE, QCC, Nagpur stated (October 2012) that the inspection were carried out as per progress of works and there were no specific targets. The SE, QCC, Aurangabad stated that shortfall in inspection was due to vast jurisdiction *i.e.* 12 districts of Marathwada. The replies are not acceptable as the GoM directives stipulated minimum days of inspection which the SEs, QCCs did not follow.

4.5 Man power shortage

Details of sanctioned strength (SS) and men in position (MIP) in the three QCCs during 2009-10 to 2012-13 are given in **Table 4.12**.

Table 4.12: Details of MIP vis-à-vis sanctioned strength

Name of Circle	2009-10		2010-11		2011-12		2012-13	
	SS	MIP (*per cent*)	SS	MIP (*per cent*)	SS	MIP (*Per cent*)	SS	MIP (*Per cent*)
Auran-gabad	303	227 (74.92)	303	217 (71.62)	303	232 (76.57)	303	249 (82.18)
Nagpur	403	169 (41.94)	403	210 (52.11)	403	205 (50.87)	478	322 (67.36)
Pune	628	529 (84.24)	678	533 (78.61)	678	514 (75.81)	678	519 (76.55)
Source : Information furnished by the Department								

The manpower shortage in Nagpur was 32.64 *per cent* and that in Aurangabad and Pune was 17.82 and 23.45 *per cent* respectively during 2012-13.

The position of technical posts under the SE, QCC, Aurangabad, Nagpur and Pune as of March 2013 was as shown in **Table 4.13**.

Table 4.13: Shortage of technical staff

Sr. No.	Post	Pune			Nagpur			Aurangabad		
		SS	MIP	Percentage Shortfall	SS	MIP	Percentage Shortfall	SS	MIP	Percentage Shortfall
1.	Sub-Divisional Engineer	27	23	15	19	13	32	12	12	0
2.	Assistant/ Section/ Junior Engineer	155	106	32	108	61	44	68	54	20.59
3.	Civil Engineer Assistant	63	54	14	42	21	50	27	26	3.70
4.	Laboratory Assistant	63	46	27	42	28	33	27	18	33.33
Source: Information furnished by the Department										

The shortfall in technical posts in Pune and Nagpur ranged between 14 and 32 *per cent* and 32 and 50 *per cent* respectively.

The Government stated (August 2013) that sizeable number of vacancies have been filled up in 2012-13 while the proposal for filling up the remaining posts are under consideration and would be filled up on approval by the concerned authorities. Verification by audit in three QCCs revealed that the overall vacancies in the post of AE/JE increased from 18.48 *per cent* in March 2010 to 33.23 *per cent* in March 2013. The vacancies in the post of AE/JE in Pune and Aurangabad QCCs increased from 2.78 to 31.61 *per cent* and from 4.41 to 20.59 *per cent* during 2010-13 respectively. The vacancies in the post of Laboratory Assistant in Pune QCC also increased from 15 to 26.98 *per cent* during 2012-13. Thus, shortage of manpower continued to hamper regular inspections and quality testings.

Chapter 5

Project Performance

Chapter 5

Project Performance

5.1 Introduction

Irrigation projects are capital intensive and therefore, it is necessary to maintain them properly to achieve long term benefits. For improving the performance of water resource projects, WRD conducts benchmarking of projects[117] on various indicators like area irrigated per unit of water, agriculture productivity, operation and maintenance cost per unit of area irrigated *etc*. Water audit is also conducted to determine the water usage in different sectors, loss due to evaporation and leakages, canal conveyance, efficiency of main canals, cropping pattern *etc*.

Audit findings

5.2 Project Performance

As per the State Water Policy, 2003, the benchmarking of all the projects was to be done in a phased manner so as to cover all the projects in a period of five years. Benchmarking of projects was done annually by the Maharashtra Water Resource Development Centre (MWRDC), Aurangabad since 2000-01 MWRDC also prepares water audit reports. Audit observed that:

- Benchmarking and water audit reports were prepared by MWRDC only up to 2010-11. Moreover, only 1,335 projects were covered for benchmarking as against 3,712 completed/ongoing projects.
- The benchmarking report of 2010-11 pointed to lack of an integrated action plan on the part of project authorities to improve the performance.

Audit also observed inadequacies in maintenance of dams, canals and distributaries, evaporation losses and leakages, inefficiency in canal conveyance and supply of water to perennial crops (cash crops) *etc.* which eventually led to poor utilisation of IP. The audit findings are indicated in the succeeding paragraphs.

5.2.1 IP creation and utilisation

As per the Economic Survey Report of Maharashtra for the year 2011-12, the total geographical area of the State is 308 lakh ha of which gross cropped area[118] is 226 lakh ha (2010-11). The IP projected to be created, IP created and IP utilised in respect of total projects handed over by GoM and new projects taken up by IDCs (1,613 projects as referred to in **Table 3.1** of **Chapter 3**) is given in **Appendix 5.1.** The overall position of IP projected to be created, IP created and IP utilised in the State during the period 2000-2012 is given in **Appendix 5.2**. Audit scrutiny revealed the following :

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[117] It is a powerful management tool for analyzing and improving the performance of projects

[118] Gross cropped area is the net cropped area including the area sown more than once

- As against IP of 32.44 lakh ha created (June 2013) from the projects handed over by GoM to IDCs and projects taken up by the IDCs, the IP utilised as on June 2012 was 17.04 lakh ha (52.53 *per cent*) (**Appendix 5.1**). In the 87 test checked projects, as against IP of 4.37 lakh ha created (65 projects), the IP utilised was 1.22 lakh ha (27.92 *per cent*) (**Appendix 3.1**). One of the reasons for shortfall in IP utilisation is seepage through *unlined* canals, as also discussed in **paragraph 5.2.4**. The Government may examine the suitability of adopting new canal lining technologies to arrest seepage through canals.
- IP created increased by 11.20 lakh ha between 2000-01 and 2011-12 *i.e.* an increase of 30.22 *per cent* in 12 years or, an annual average increase of 2.52 *per cent* and the percentage of total IP utilisation to IP created increased from 47.60 *per cent* to 67.36 *per cent*, while the IP utilisation through canals to total IP utilised decreased from 73.58 *per cent* to 62.84 *per cent* (**Appendix 5.2**). The Principal Secretary stated that GoI has appointed IIM, Bangalore to study the gap in IP utilization and that created to reduce the gap. It was further stated that Government is contemplating to promote micro irrigation[119] in those area where there are water intensive crops.

The Secretary of WRD during exit conference held in July 2013 stated that in Maharashtra there is no laid down definition as to how IP created is to be measured but once the dam and the distribution network up to the outlet is ready as per the project, it is considered that the IP is created. Though, project-wise data of IP creation under different IDCs is compiled and published in Irrigation Status Report (ISR) every year there is no data regarding distribution network relating to creation of IP in the ISR. In the exit conference, the Principal Secretary, WRD accepted that there may be cases where a project was showing IP created though the distribution network remained incomplete. The Government stated (October 2013) that instructions have been given to all the CEs to collect data of field channels constructed and area covered for inclusion in the ISR.

- While preparing the irrigation project reports, WRD does not take into account the IP projected to be created through wells as it is not possible to predict the number of wells that would come up in future in the command area of the projects. However, scrutiny of ISRs for 12 years (2000-01 to 2011-12) revealed that the total IP utilized from irrigation projects included IP utilized through canals, rivers as well as wells as shown in **Appendix 5.2**. Test check of data in the ISRs for the period 2007-08 to 2009-10 revealed that the IP utilized through wells was in the range of 31.39 to 34.88 per cent of the total IP utilised through canals, rivers and wells indicating that the total IP utilized was inflated to that extent. The Government stated (November 2012) that ground water in the command area of irrigation projects gets recharged due to circulation of water in the command area and if there is no irrigation, the nallas or streams or wells in the command will not get recharged.

[119] A system of tubes and drippers which deliver water directly to the base of each plant or crop to use water with much greater efficiency than that provided by conventional sprinkler systems

The reply is not acceptable as the Economic Survey Reports for the period 2007-08 to 2009-10 revealed that the total average area irrigated in the State from wells was 21.42 lakh ha whereas, during the same period, the average area irrigated from wells located in the command areas of irrigation projects (both State and local sectors) was 12 lakh ha indicating that an area of 9.41 lakh ha was still irrigated from wells located outside the command area of irrigation projects.

Audit scrutiny of Nandur-Madhmeshwar major irrigation project under GMIDC revealed that as per the ISR of WRD for the year 2010-11, the project created an IP of 38,230 ha which was 84.72 *per cent* of projected IP to be created of 45,124[120] ha. The project involved construction of four dams[121] and an express[122] canal of 128 km. The total requirement of live storage of water for the project was 288.99 mcum. However, till March 2013, only two[123] of the four dams were completed and a storage capacity of only 56.50 *per cent* had been created, of which, 44.5 *per cent* of available water was reserved during the period 2008-2012 for non-irrigation use by Nashik Municipal Corporation (as per HPC's[124] decision of November 2003). As a result, the availability of water reduced to 31.36 *per cent*[125] of the total requirement of water for the project. Thus, IP of 84.72 *per cent* reported to be created under the project appeared to be doubtful.

5.2.2 Usage of water for non-irrigation purpose

The water stored in the reservoirs is recorded on 15 October each year. The stored water is then utilised till the start of the rainy season of the following year. The use of water for irrigation and non-irrigation purpose during 2007-12 is detailed in **Table 5.1**.

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120 Ahmednagar 1,562 ha; Aurangabad 42,298 ha; and Nashik 1264 ha

121 Mukne, Bhavali, Bham and Waki

122 A canal for distribution of water from end to end point without any intermediate distribution network

123 Mukne completed in 2006 and Bhavali in 2009 with live storage capacity 122.48 mcum and 40.79 mcum respectively

124 Allocation of water for non-irrigation purpose by more than 25 *per cent* was to be referred to a High Power Committee headed by the Minster (Water Resources), Minister (Finance), Minister (Water supply and Sanitation), Minister (Industries), Minster (Agriculture) and Minister of State (Water Supply). The Additional Chief Secretary, (WSSD) and the Secretaries (Irrigation/Command Area) were the permanent invitees as per GR of January 2003

125 44.5 *per cent* of 56.50 *per cent* (storage created) = 25.14 *per cent*
56.50 *per cent* - 25.14 *per cent* = 31.36 *per cent*

Table 5.1: Use of water for irrigation and non-irrigation purposes (volume in mcum)

Year	Live storage (15 October)	Water used for Irrigation	Percentage water used for irrigation to live storage	Water used for non-irrigation purpose				
				Drinking	Indust-rial	Other use (*per cent* to total)	Total	Percentage of total water used for non-irrigation purpose to live storage
1	2	3	4 (3/2)	5	6	7	8 (5+6+7)	9 (8/2)
2007-08	25489.18	16412.75	64.39	2801.80	581.90	2156.94 (38.93)	5540.64	21.74
2008-09	24802.74	15517.18	62.56	3444.72	575.43	1755.32 (30.39)	5775.47	23.29
2009-10	19365.78	12113.64	62.55	3151.41	610.31	1001.47 (21.03)	4763.19	24.60
2010-11	27309.26	15446.60	56.56	3260.22	656.11	1959.93 (33.35)	5876.26	21.52
2011-12**	23730.92	18283.13	77.04	2708.59	388.41	980.01 (24.04)	4077.01	17.18

Source: Figures for 2007-08 to 2010-11 from Irrigation Status Report of WRD and figures for 2011-12 consolidated from latest available ISR of the six regions in the State.
** Data for 2011-12 excludes data of Konkan region due to data inconsistency

The use of water for non-irrigation purpose under the category 'other use' was significant and ranged between 21.03 *per cent* (2009-10) and 38.93 *per cent* (2007-08) of the total water used for non-irrigation purpose during the period 2007-11. Considering this high percentage of water under 'other use'[126] it is necessary to classify it further for the sake of transparency.

The Government stated (October 2013) that instructions have been issued in August 2013 to field offices for further classification of usage of water under 'other use'.

5.2.3 Evaporation losses

The State Water Policy, 2003 envisaged that measures to control evaporation from water bodies should be taken and efforts made to make the process more cost effective.

The evaporation loss in the State during 2007-12 is given in **Table 5.2**.

Table 5.2: Evaporation loss in the State (Volume in mcum)

Year	Live storage as on 15 October	Evaporation loss	Percentage of evaporation loss to live storage.
1	2	3	4 (3/2)
2007-08	25489.180	4481.240	17.58
2008-09	24802.740	4074.320	16.43
2009-10	19365.780	3972.110	20.51
2010-11	27309.260	5383.100	19.71
2011-12	26938.183	5298.353	19.67

Source: Figures for 2007-08 to 2010-11 from Irrigation Status Report of WRD and figures for 2011-12 consolidated from latest available ISR of the six regions in the State

As seen from the table above the evaporation loss increased from 17.58 *per cent* in 2007-08 to 19.67 *per cent* during 2011-12.

In the four test-checked regions of Konkan, Pune, Aurangabad and Nagpur regions, audit noticed increase in the percentage of evaporation losses to live storage between 2007-08 and 2011-12 as detailed below in **Table 5.3**.

[126] Other use include water released as per the demand of local people as well as direction of district authorities for the purpose of Ganesh festival, drinking water for live stocks *etc*

Table 5.3: Region wise evaporation losses during 2007-12

Region	Range of evaporation loss between 2007-12		Remarks
	Minimum	Maximum	
Konkan	5 *per cent*	11 *per cent*	The evaporation losses in the region ranged between 5 and 11 *per cent* during 2007-12 and in fact more than doubled during the last five years.
Pune	12 *per cent*	15 *per cent*	The evaporation losses in the region ranged between 12 and 15 *per cent* during 2007-12. Evaporation loss in minor projects of Pune Region was consistently high which increased from 20 *per cent* in 2007-08 to 30 *per cent* in 2011-12.
Aurangabad	19 *per cent*	37 *per cent*	The evaporation losses in the region ranged between 19 and 37 *per cent* during 2007-12. Evaporation loss in nine medium projects in each year was more than 50 *per cent*. No justification was provided by the Regional office for such high evaporation losses.
Nagpur	9 *per cent*	20 *per cent*	The evaporation losses in the region ranged between 9 and 20 *per cent* during 2007-12. Evaporation loss in seven[127] medium projects in 2010-11 and four[128] medium projects in 2011-12 *was* more than 25 *per cent*. The CE, WRD (Nagpur) stated that the losses were high due to clubbing of evaporation losses and transit losses. Thus, due to clubbing of losses the Department could not identify the extent of each loss for taking remedial measures.
Source: Regional Irrigation Status Report up to 2007-12. RISR for 2012 -13 not prepared by the WRD			

The data furnished in Water Account[129] of individual irrigation projects are compiled in ISR of the region, which is further consolidated in the ISR of the State. Scrutiny of Water Accounts in respect of three selected projects (Bhatsa, Ujjani and Wadivale) revealed discrepancies in water accounts of the project and ISR of the region, as indicated in **Table 5.4**.

Table 5.4: Discrepancies in evaporation losses of Bhatsa, Ujjani and Wadivale projects (Volume in mcum)

Year	Evaporation loss as per water account of the project			Evaporation loss as per ISR of Region			Difference		
	Bhatsa	Ujjani	Wadivale	Bhatsa	Ujjani	Wadivale	Bhatsa	Ujjani	Wadivale
2007-08	24.638	433.580	5.184	24.000	450.680	4.040	0.638	17.100	1.144
2008-09	30.835	415.800	4.582	27.986	425.200	4.050	2.849	9.400	0.532
2009-10	25.978	358.000	4.813	22.338	380.070	5.320	3.640	22.070	0.507
2010-11	26.717	319.220	4.790	23.728	323.910	4.810	2.989	4.690	0.020
2011-12	29.304	385.470	4.800	29.304	412.730	4.800	0.000	27.260	0.000
Source: Water account of the three project and regional ISR									

Further analysis of data for the period 2007-11, based on which water audit reports were prepared, revealed that evaporation loss in 17 projects was more than 200 *per cent* and ranged between 201.63 and 10,066.67 *per cent* with reference to the live storage of water on 15 October (**Appendix 5.3**), indicating incorrect assessment/compilation of data on evaporation losses.

The Government stated (October 2013) that to avoid data discrepancies necessary steps are being taken.

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127 Sangrampur, Pakdiguddam, Surna, Lablansarad, Dham, Kalpathri and Chandani

128 Dham, Kalpathri, Dongargaon and Madan: The Chandani medium project (2010-11) and Madan medium project (2011-12) have recorded the evaporation losses of more than 50 *per cent i.e.* 62.01 *per cent* and 53.55 *per cent* respectively

129 Water Account is the primary data of a project, prepared by the Division executing the project and containing information about the water storage, its utilisation and balance existing as on end of June each year

Further, losses on account of seepages were not available for major and medium irrigation projects in the water audit reports as also in the ISR prepared annually by WRD. The water audit reports also did not indicate loss in transit, pilferage *etc*. in canals separately.

WRD should identify projects with high evaporation losses and take remedial measures to control the losses as envisaged in the State Water Policy, 2003.

As per the guidelines issued by GoM from time to time, pan-evaporimeters were to be installed at every project having Culturable Command Area (CCA) of more than 1,000 ha for correct assessment of evaporation losses. Audit scrutiny revealed that pan-evaporimeters were installed only in five out of 16 major projects in Nagpur Region, 15 out of 27 major projects in Aurangabad region and 11 out of 23 major projects in Pune Region[130], having CCA of more than 10,000 ha. In the absence of pan-evaporimeters, the evaporation losses were recorded from the nearest pan-evaporimeters or estimation made in the project reports as per Government Resolution of March 2001. This method of assessment of evaporation losses was not scientific and susceptible to errors, resulting in failure to identify the exact cause and quantum of loss for taking corrective action.

The Government stated (June 2013) that installation of pan-evaporimeters requires lot of funds and needs proper care and maintenance. Hence, within the constraints of funds and manpower, attempt shall be made to install as many pan-evaporimeters as possible. The Government further stated (October 2013) that instructions have been issued (August 2013) to Chief Engineers to install pan-evaporimeters in all major and medium projects from available funds and carry out its regular maintenance.

Discrepancies in the data of evaporation losses, assessment of evaporation losses in absence of pan-evaporimeter and non-quantification of loss on account of theft, pilferage and transit losses indicated lack of a robust system in WRD to identify the nature and extent of loss to allow remedial measures to be taken.

The GoM directed (June 2003) that SEs of the respective maintenance circles should obtain the annual water accounts from the divisional offices and submit the same to CE, Maharashtra Water Resources Development Centre, Aurangabad (MWRDC), who is responsible for audit of these accounts as well as issue of audit paragraphs on such accounts.

Scrutiny of water audit reports for the period from 2007-08 to 2010-11[131] revealed that the water accounts were not received in respect of 35.82 *per cent* of the dams each year, resulting in non-audit of water accounts to that extent.

Scrutiny of records in five circles revealed that out of 1,620 audit paragraphs on water account, only 369 paragraphs (23 *per cent*) were closed and 1,251 paragraphs (77 *per cent*) were outstanding for the period 2003-11 in respect of both Aurangabad and Nashik regions.

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[130] In Konkan Region pan-evaporimeters were installed in all the projects

[131] As against 13,480 water accounts during 2007-11, 4,829 water accounts were not received. Water audit reports from 2011-12 onwards were not prepared

The Government stated (July 2013) that instructions have been issued to the CEs of all the regions[132] for submission of water accounts to MWRDC, Aurangabad on time. The Government further stated (October 2013) that instructions are being issued to all the regions for early compliance to water account paragraphs.

5.2.4 Poor maintenance of dams and canals

The norms for incurring expenditure on maintenance and repairs (M&R) of irrigation projects were last revised by GoM in July 2002. The expenditure on M&R ranged between ₹ 118.97 crore (2008-09) and ₹ 246.19 crore (2010-11) during 2007-13. In the absence of updated norms for M&R expenditure, Audit was not able to assess the adequacy of funding under M&R. A study report submitted[133] (2008) to WRD by Water and Land Management Institute (WALMI), Aurangabad recommended revision in the M&R norms in view of price escalation. The Government stated (October 2013) that proposal for revision of norms has been approved by Finance Department and GR issued in August 2013.

Instances of poor maintenance of irrigation projects due to insufficient allocation of funds or delay in taking up repair works are discussed below.

5.2.4.1 Bhatsa major irrigation project, Thane

The last RAA to the project was accorded in October 2007 at a cost of ₹ 768.10 crore. Despite an expenditure of ₹ 498.44 crore on the project as on June 2013, the average IP utilized against IP created was only 13.38 *per cent* during 2007-12. The Dam Safety Organisation pointed out (June 2003) the leakages through the body of the dam and recommended precautions to be taken to arrest leakages. Joint visit (December 2012) conducted by audit along with the officials of WRD revealed leakages through the dam walls and spillways damaged canals and growth of grass and shrubs in the canal bed and the off taking distributary from the main canal, thereby affecting the flow of water. The cross regulator[134] and lifting device at chainage 26/765 km and 21/500 km were not functioning as regulators were stuck due to which the flow of water could not be regulated.

Grass in main canal bed

Off taking distributary blocked at chainage 32/985

[132] Amravati, Nagpur, Pune, Konkan, Aurangabad and Nashik regions
[133] The study report was commissioned by Water Resource Department and MWRRA
[134] Gates fixed in the canal to regulate the flow of water for repairs or any eventuality

Non-functioning cross regulators at chainage 26/765

Non-functioning cross regulators at chainage 21/500

The Government stated (August 2013) that efforts would be made to reduce the leakages.

5.2.4.2 Rajnala medium irrigation project, Raigad

Audit observed that as against the IP of 3,190 ha created, the IP utilisation decreased from 69 *per cent* in 2007-08 to 60 *per cent* in 2009-10 and became nil during 2010-12. This was due to heavy leakages through rusted iron gates and damaged RBC, LBC and canal bed of Palipotal canal. Audit further observed the following:

- The Department decided (April 2006) to execute special repairs to the three canals (RBC, LBC and Palipotal) but AA was accorded only in June 2008 (after a delay of 25 months) for works relating only to LBC at a cost of ₹ 4.81 crore. However, as the lining work of the canal was not considered in the initial estimates, a revised AA for ₹ 53.59 crore was accorded (March 2011) for special repairs[135] to all the three canals five years after the decision to undertake special repairs was taken.
- Work order was issued in June 2011 and the work was stipulated to be completed by June 2013. However, till June 2013 only 75 *per cent* of work was completed after incurring an expenditure of ₹ 58.98 crore.

The Government stated (August 2013) that the work was under progress and would be completed in due course.

5.2.4.3 Hetawane medium irrigation project, Raigad

It was observed that the loss of water from the dam increased from 21.82 *per cent* during 2009-10 to 39.48 *per cent* during 2011-12 on account of damage to the rubber seal of the emergency gate.

The Government stated (August 2013) that the work of replacement of damaged rubber seal and changing of wire ropes of emergency gates were in progress.

5.2.4.4 Khadakwasla major irrigation project, Pune

It was noticed in audit that:

[135] Special repairs included clearing and removal of grass in canals, constructing embankment, providing concrete lines to bed and sides of the canals *etc.*

- There was transit loss of water of 70.79 mcum *per annum* due to non-maintenance of RBC of Khadakwasla project passing through Pune city.
- The embankment of the canal was damaged but maintenance was difficult due to encroachment along the canal and the need to maintain constant water supply in it, as Pune Municipal Corporation was lifting water for drinking purpose from the canal.

The Government stated (August 2013) that after the work of closed piped water system from Khadakwasla dam to Parvati Treatment Plant undertaken by Pune Municipal Corporation is completed, repairs to the canal would be undertaken to prevent the loss.

5.2.4.5 Wadivale medium irrigation project, Pune

The work of construction of the dam was completed in 1995 and the canal work was completed in 1999 at a cost of ₹ 6.68 crore. However, IP of 1,876 ha created through canals could not be utilised since 1999 due to the following reasons.

- Irrigation through canals was abandoned from 1999 onwards due to heavy leakages from both the canals (RBC and LBC). This was also pointed out in the Report of the Comptroller and Auditor General of India for the year 2004-05 of GoM.
- Instead of repairing the canals to avoid leakages, it was decided (May 2008) to irrigate the area through pipes at a cost of ₹ 21.80 crore.
- The work of laying RCC pipes on RBC has not yet commenced while the work on LBC was in progress. As of March 2013, an amount of ₹ 34.56 crore has been spent on the project.

The Government stated (October 2013) that irrigation was done through water stored in KT weirs and lifted through water pumps and that the work of pipelines of LBC was nearing completion. The fact remained that irrigation through canals has not been done since 1999.

5.2.4.6 Kukadi major irrigation project, Pune

Kukadi, an ongoing major project, has a capacity to store 1,054.67 mcum of water, with a CCA of 2.05 lakh ha covering Pune (0.74 lakh ha), Ahmednagar (0.99 lakh ha) and Solapur (0.32 lakh ha) districts. Till June 2013, an expenditure of ₹ 1,928.60 crore has been incurred on the project. Audit observed that out of 0.32 lakh ha CCA in Solapur district, CCA of 0.19 lakh ha was developed by March 2008. However, the command area of Solapur district was not irrigated during 2008-12 as the lining work on the tail end of the LBC of Kukadi Project was not taken up.

The Government stated (October 2013) that lining work could not be completed due to shortage of funds.

5.2.4.7 Ujjani major irrigation project, Solapur

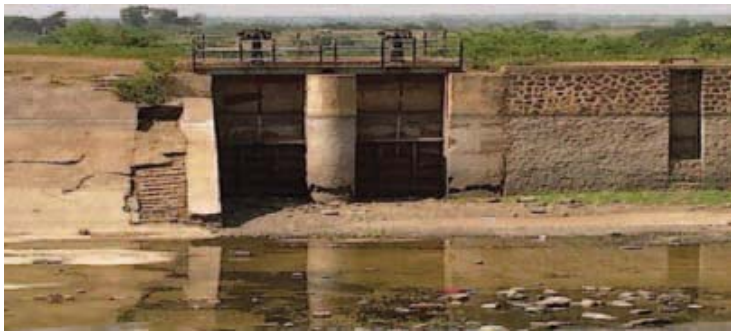
Ujjani, an ongoing major project, was taken up in 1969 with projected IP to be created of 2.6 lakh ha. The work was still in progress and an expenditure of

₹1,274.30 crore had been incurred on the project up to June 2013. Audit observed the following:

- The DSO in 2009 noticed leakages of 100 cusecs (approximately 2,832 litres per second) from the four sluice gates[136] of the dam. However, necessary repairs were not carried out which resulted in leakage of 89.31 mcum of water *per annum* resulting in reduced IP utilisation, which ranged between 76 and 85 *per cent* during 2007-12.
- Technical sanction for repair to one gate at an estimated cost of ₹ 46.38 lakh was accorded only in May 2012.

Leakages in Ujjani dam

- During joint visit (October 2012) conducted by audit along with the officials of WRD, it was observed that the canal was heavily damaged between chainage 0/00 km and 2/00 km of its length.



Damaged pillar at the entrance of minor nearest to Ujjani LBC

[136] A barrier sliding in grooves that are set in the sides of the waterway to allow water flow under it


Damaged lining of Ujjani LBC

The Government stated (August 2013) that the repair to sluice gates would be completed by December 2013. It added that the LBC was not heavily damaged between 00 to 02 km and there were only meagre loss. It stated that repairs were carried out as per the availability of funds. The fact remained that there was loss of water and repairs have not yet been carried out. Further, the canal efficiency was only 42 *per cent* (LBC) and 30 *per cent* (RBC)[137] during rabi season for the year 2011-12.

5.2.4.8 Sirsinala minor irrigation project, Nagpur

Joint visit conducted (September 2012) by audit along with the officials of WRD revealed that due to faulty head regulator there was leakage of water and vegetation growth in the canals.

Vegetation growth and water leakage from head regulator in canal, Sirsinala Project, Nagpur

The EE, MPD, Nagpur attributed (September 2012) the poor condition of canals to non-availability of funds and manpower for maintenance. The Government stated (October 2013) that repairs to head regulator would be carried out by the Mechanical Organisation and the vegetation growth in the canal has been removed.

[137] As per the water account of Ujjani project for the year

5.2.4.9 Jambnala minor irrigation project, Yavatmal

The dam work of Jambnala project was completed (June 1999). The maximum utilised IP was 275 ha against the created IP of 750 ha (36.67 *per cent)* in the year 2007-08. During joint inspection (September 2012) by audit and officials of WRD, the following observations were made:

- There was leakage from the head regulator and the gate of the head regulator could not be operated as the shaft rod[138] was stolen.


Absence of shaft rod and leakage of water in the canal in Jambnala project, Yavatmal

- The thick vegetation and heavy siltation in the entire length of main canal up to three km did not allow for full discharge of water.


Thick vegetation and heavy siltation in canal

- The trough[139] to carry water at chainage 1.020 km was also full of vegetation. On water being let in the canal, the same could not pass through the trough due to blockage and resulted in wastage of water as it leaked from the sides.
- Outlet in minor[140] No. 1 was found to be damaged. The field channels for minors between km one to six km were not completed.

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[138] It is a rotating rod which through its motion operates the gate of head regulator
[139] A bridge on the canal for passage of water
[140] Minor is a branch of the distributary of any canal

Broken outlet and non-functional structure

The Government stated (October 2013) that the rod of head regulator has been fixed, vegetation and siltation in the main canal up to three km removed, trough at chainage 1.020 km cleaned and field channels are being completed.

5.2.5 High siltation in reservoirs

Siltation occurs when rivers bring silt to the reservoirs during monsoon and a significant proportion of the silt settles down in the reservoir, reducing the water storage capacity and benefits from the projects.

Scrutiny of Water Audit Report for the year 2009-10 revealed that:

- The rate of siltation in six[141] of 12 dams was more than the designed rate[142] based on sedimentation studies conducted by Maharashtra Engineering Research Institute (MERI), Nashik during 2007 and 2008 through Remote Sensing Technique.
- The loss of live storage of water due to siltation in these six dams worked out to 189.134 mcum sufficient to irrigate 24,587 ha[143] of land during Rabi and hot weather season. As silt removal is costly, maintenance works need to be undertaken to reduce siltation by adopting appropriate catchment area techniques like plantation, check dams[144] *etc*.

5.2.6 Allocation of water

As per the National Water Policy of 2002, water was to be allocated in the following order of priority (i) drinking water (ii) irrigation (iii) industries. GoM in its State Water Policy, 2003, prioritised the allocation of water amongst (i) drinking water, (ii) industry and (iii) irrigation. However, irrigation was assigned second priority in place of industries by GoM in May 2011. The sectoral reservation of water was fixed for drinking water (15 *per cent*), industries (10 *per cent*) and irrigation (75 *per cent*). As already mentioned in **paragraph 5.2.1**, allocation of water for non-irrigation purpose

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141 1) Veer – 30.384 mcum, 2) Bhatgar – 108.590 mcum, 3) Varasgaon – 2.122 mcum, 4) Karanjwan – 8.598 mcum, 5) Lower Wunna – 9.190 mcum and 6) Mula 30.250 mcum

142 The annual designed rate at which siltation occurs in dam storage

143 189.134 mcum x 130 ha = 24,587 ha (considering the average standard of 130 ha/mcum fixed by GoM during rabi and hot weather season)

144 A check dam is a small dam which can be either temporary or permanent to reduce erosion and allow sediments and pollutants to settle

by more than 25 *per cent* was to be referred to the High Power Committee headed by the Minister, Water Resources. Further, any change in reservation of water by more than 25 *per cent* for non-irrigation purpose was subject to recovery of restoration charges at the rate of ₹ 0.50 lakh per ha (revised to ₹ one lakh from April 2009) from non-irrigation users on account of curtailment of irrigable area. Analysis of the water account data for the year 2008-10, furnished by MWRDC, Aurangabad revealed that in 54 out of 293 projects, the use of available water for irrigation purpose was less than 75 *per cent*.

Audit observations on three out of 54 projects, where restoration charges were not recovered, are discussed in the succeeding paragraphs.

5.2.6.1 Gangapur-Darna major irrigation project, Nashik

HPC approved (August 2007) reservation[145] of water (399.63 mcum per year) up to the year 2041 to Nashik Municipal Corporation (NMC) on the condition that 65 *per cent* of the water would be released subsequently into Godavari river after treatment. An agreement was to be executed within three years failing which the allocation approved by HPC was to lapse automatically.

- Agreement for the allocation approved by HPC in August 2007 was not executed by GMIDC with NMC except agreement for earlier allocation[146].
- NMC used 491.27 mcum[147] of water for urban drinking purpose during 2008-12. In the absence of agreement, recovery of restoration charges by WRD on account of curtailment of irrigation area was not done though the water allocated for non-irrigation purpose was more than 25 *per cent*.

The Government stated (October 2013) that in view of its poor financial condition, the NMC requested for payment of restoration charges of ₹ 151.73 crore in instalment, due to which, the issue was pending.

HPC also approved in March 2008 (i) reservation of 39.60 mcum of water per year to MIDC, a Statutory Government Corporation for Sinnar Industrial Area; and (ii) reservation of 43.80 mcum of water per year to India Bulls Mega Power Plant (IBMPP). The requirement for IBMPP was to be met from 65 *per cent* of water that was to be released into Godavari river by NMC after treatment, as per the reservation approved (August 2007). Audit scrutiny further revealed the following:

- An agreement was to be executed within three years of grant of approval failing which, the allocation approved by HPC was to lapse. The reservation of water to MIDC, was cancelled in March 2011 due to non-execution of agreement.
- Similarly, though the validity of approval granted to IBMPP expired in March 2011, GoM granted (June 2011) extension of time up to May 2012 for execution of agreement. Accordingly, IBMPP executed an agreement

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[145] Up to 2011- 140.85 mcum per year; up to 2021- 203.31mcum per year; up to 2031 - 287.89 mcum per year and up to 2041-399.63 mcum per year

[146] Earlier, quota of 64.76 mcum was sanctioned April 1996 and agreement executed in April 2006 for the period 2005-11

[147] 2008-09: 119.428 mcum; 2009-10: 114.399 mcum; 2010-11: 129.569 mcum; and 2011- 12: 127.874 mcum

with the WRD in January 2012. The grant of extension after the validity of HPC approval was not in order and also showed disparity in implementation of HPC recommendations in both the cases (MIDC and IBMPP). The Government stated (October 2013) that IBMPP signed an agreement before the expiry of the extended period (May 2012). The fact remained that extension was given after the validity of the initial approval by the HPC had expired.

- Restoration charges of ₹ 26.37 crore on account of loss of irrigation potential of 5,120 ha for diversion of 43.80 mcum of water to IBMPP was recovered in January 2012 at ₹ 50,000 per ha instead of ₹ one lakh per ha, resulting in short-recovery of restoration charges to the extent of ₹ 25.60 crore.

5.2.6.2 Pawana medium irrigation project, Pune

Pawana project had a gross storage capacity of 305 mcum with live storage of 274 mcum. Audit observed that:

- The agreement between Khadakwasla Irrigation Division, Pune and MIDC Chinchwad for supply of 59.128 mcum of water from Pawana dam was renewed in October 2010 for six years. However, restoration charges of ₹ 32.49 crore for loss of IP of 3,249 ha at ₹ one lakh per ha was not recovered at the time of renewal of agreement. The Government stated (October 2013) that Pawana dam does not have canals and distribution network, as such, there was no loss of IP and the question of recovery of restoration charges did not arise. The reply is not acceptable as ISR of 2010 indicated that IP of 6,370 ha was created as on June 2011 and thus, restoration charge was recoverable.
- On the basis of sanction[148] granted by Khadakwasla Irrigation Division, Pune, Pimpri Chinchwad Municipal Corporation was lifting 137.094 mcum of water. However, restoration charges of ₹ 37.66 crore for lifting 137.094 mcum of water and consequent loss of IP of 7,533 ha was not recovered.
- Scrutiny of Water Account of Pawana project (2011-12) revealed that 53 consumers lifted 28.940 mcum of water during 2011-12, against the sanctioned quota of 32.438 mcum. The billing was done on the basis of 90 *per cent* of the sanctioned quota even though consumption was less than 90 *per cent*. There was no condition in the agreement to reduce the sanctioned quota on the basis of actual use so that unutilised water could be re-allocated to those who required this scarce resource.

5.2.6.3 Hetawane medium irrigation project, Raigad

Due to increase in demand for water for non-irrigation purposes, it was decided (December 2007) by the HPC that more than 25 *per cent* of the total storage of water be reserved for non-irrigation purposes. Accordingly, revised reservation of water (48.640 mcum) for non-irrigation purpose was made by KIDC to CIDCO, ISPAT, Tata Power and drinking water for Vashi village. In

[148] October 1985- 49.932 mcum, December 1996 - 49.932 mcum and October 2004 - 37.23 mcum

addition, 26 million litres per day was reserved for MahaMumbai SEZ (MSEZ) for five years. It was observed that:

- The restoration charges for loss of IP were to be recovered before execution of formal agreements with these agencies and the reservations would stand cancelled if the allotted water was not lifted by the concerned agencies within three years of allotment. KIDC, however, did not specify the period within which the charges were to be recovered and agreements executed.
- In the absence of any specific time period, the reservations continued for three years without recovery of any charges and execution of agreements.
- The water was also not lifted by these agencies. The reservation of CIDCO was cancelled automatically after lapse of three years, while reservations in remaining cases were cancelled only in September 2011.

The Government stated (October 2013) that since the agencies did not use the sanctioned water, the restoration charges were not recovered. The fact remained that in the absence of any definite time frame for execution of agreements and recovery of restoration charges the reservation continued for three years without any benefit accruing to WRD. Further, the unutilised water under reservations was also not used for irrigation purpose.

5.2.7 Performance of irrigation system

Irrigation system performance is measured in terms of the area irrigated per unit of water used. To measure the efficiency of the irrigation system the average irrigation system performance was considered at 130 ha/mcum of water by WRD. This was based on the standard efficiency of 150 ha/mcum of water for Rabi and 110 ha/mcum of water for hot weather.

The Benchmarking Report revealed poor efficiency of the projects as under:

- During 2009-10, in 30 of the 50 major projects and 78 of the 166 medium projects, the areas irrigated were less than 130 ha/mcum of water (ranging between five and 129 ha/mcum). In 32 out of 108 projects, the area irrigated per mcum of water was shown as nil.
- During 2010-11, in 34 of the 50 major projects and 88 of the 171 medium projects, the area irrigated was less than the benchmark of 130 ha/ mcum of water (ranging between 10 and 124 ha/mcum). In one project, the area irrigated per mcum of water was shown as nil.

Audit scrutiny of water accounts in four test-checked canals (Bhatsa RBC, Ujjani LBC, Ujjani RBC and Neera RBC) revealed that the efficiency of irrigation system during 2007 to 2012 was poor (**Appendix 5.4**) and ranged between 24.65 ha/mcum and 140.35 ha/mcum during Rabi and 39.90 ha/mcum and 113.59 ha/mcum during hot weather.

The Government stated (October 2013) that that the efficiency in respect of Ujjani project during Rabi season ranged between 128 ha /mcum and 341 ha/mcum and between 89 ha/mcum and 154 ha/mcum in hot weather during 2007-12. The reply is not acceptable as the water account of Ujjani project for the year 2007-12 clearly showed lower efficiency of 48.56 ha/mcum and

101.84 ha/mcum during Rabi and 39.90 ha/mcum and 82.86 ha/mcum during hot weather, as indicated in **Appendix 5.4**.

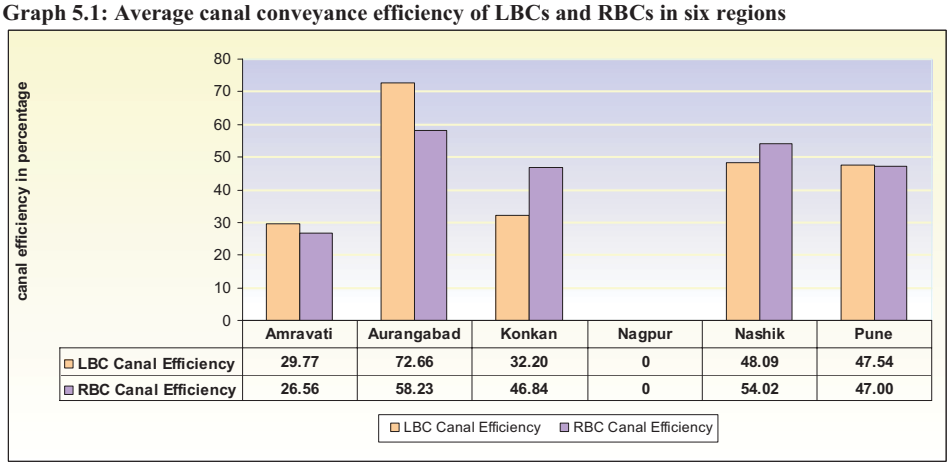
The Government attributed (October 2013) the poor efficiency in Bhatsa RBC and Neera RBC to cultivation of paddy requiring high volumes of water, high percolation losses due to soil permeability, old distributary system, cultivation of perennial crops like sugarcane etc. The fact remained that the efficiency was less than the average target fixed by Government.

The poor performance of the irrigation system was due to poor canal conveyance efficiency or change in cropping pattern involving use of more water for perennial crops. These are discussed below.

5.2.7.1 Canal conveyance efficiency

The conveyance efficiency of main canals is measured by the ratio of water released in main canal to the sum of water supplied to distributaries and lifts. Test check of data in respect of major projects in the six regions as per the database of water account for the period 2007-10 relating to conveyance efficiency of canals **(Appendix 5.5)** is depicted in **Graph 5.1**.

Graph 5.1: Average canal conveyance efficiency of LBCs and RBCs in six regions



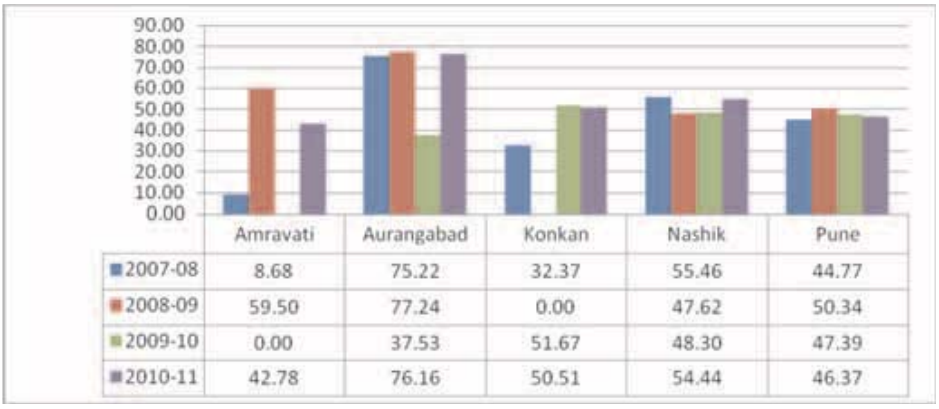
	Amravati	Aurangabad	Konkan	Nagpur	Nashik	Pune
LBC Canal Efficiency	29.77	72.66	32.20	0	48.09	47.54
RBC Canal Efficiency	26.56	58.23	46.84	0	54.02	47.00

Source: Water Accounts of the projects

As can be seen from the graph above, the canal efficiency of the projects in Amravati region was the lowest as compared to other regions. In Nagpur region, even though water was released in the canals, the efficiency was shown as Zero. The average canal conveyance efficiency of Konkan and Pune region was less than 50 *per cent*.

The year-wise analysis of canal conveyance efficiency of five regions is detailed in **Graph 5.2**.

Graph 5.2: Year-wise analysis of canal conveyance efficiency



	Amravati	Aurangabad	Konkan	Nashik	Pune
2007-08	8.68	75.22	32.37	55.46	44.77
2008-09	59.50	77.24	0.00	47.62	50.34
2009-10	0.00	37.53	51.67	48.30	47.39
2010-11	42.78	76.16	50.51	54.44	46.37

Source: Water Accounts of the projects
*Data was not available for Konkan Region (2008-09) and Amravati Region(2009-10)

It can be seen from the above graph that there were significant variations in the percentage of canal conveyance efficiency of projects.

The Government stated (August 2013) that the conveyance efficiency of canals depends upon a number of factors, such as, water released after a long gap in two rotations, maintenance and canal repair. As regards zero conveyance efficiency in Nagpur region, the Government stated that due to non-furnishing of data in the prescribed format by the field offices computer analysis showed zero value. It added that care would be taken to ensure accuracy of data. It was not clear as to why the Government allowed Nagpur region to continue furnishing data in a format other than the one prescribed for so many years.

5.2.7.2 Change in cropping pattern

Irrigation projects are planned considering the type of crops grown in the command area[149], type of soil, requirement for non-irrigation purpose *etc*. The cropping pattern in turn is largely influenced by the type of soil, availability of water and the climatic condition of the region.

An analysis of the cropping pattern envisaged at the time of project planning and the actual cropping pattern followed showed wide variations, which had adversely impacted the efficiency of the project. The Water Audit Report for the year 2009-10 recommended irrigation reduction of area under water-intensive crops to improve the efficiency of the projects as water intensive crops require more water. Audit findings on Ujjani major project are stated below:

Ujjani major irrigation project

The Ujjani dam has a gross storage capacity of 3,320 mcum with a live storage capacity of 1,517 mcum. The water projected for irrigation was 1,182.36 mcum *i.e.* 78 *per cent* of live storage. The planned cropping pattern for Ujjani project was approved by GoM (1993). An overview of the cropping pattern

[149] Command area of any project is the area brought under cultivation through irrigation project

planned and actual cropping pattern in respect of Ujjani Project is depicted in **Appendix 5.6** and revealed the following.

- Against the total projected cropped area of 2,73,298 ha[150], the area actually cropped during 2007-12 ranged between 64 *per cent* and 70 *per cent.*
- The cropped area actually irrigated using one mcum of water under the project ranged between 90.61 ha and 114.77 ha only during 2007-12, against 231.15 ha[151] per mcum envisaged under the project.
- The actual area cultivated under perennial[152] crops ranged between 73,665.5 ha and 82,121 ha during 2007-12 which was significantly more than 3,690 ha per year planned under the project. These crops being water intensive, required more water for the sown area thus, reducing the efficiency of the project (less area irrigated per mcum of water used).

The use of water from Ujjani Dam during 2009-12 for rabi and hot weather crops was planned every year in meetings chaired by Minister, WRD. The use of water planned and actual water use during 2009-12 was as given in **Table 5.6**.

Table 5.6: Planned and actual use of water in Ujjani dam

Year	Water use as per plan for Rabi and Summer[153] (mcum)	Actual Water use during rabi and summer (mcum)	Excess use of water (in *per cent*)
2009-10	1180.25	1617.98	37
2010-11	1410.18	1739.67	23
2011-12	1795.29	1867.74	4
Source: Water Account and Minutes of meetings for planned use of water; Water Account for 2012-13 was not prepared.			

The above table shows that the actual water use was more than that planned during all the three years (four to 37 *per cent*).

The Government stated (August 2013) that the main reason for low utilisation of IP was due to deviation in cropping pattern *vis-à-vis* what was envisaged in the project report particularly because of the sugarcane cultivation.

5.2.8 Schemes to improve IP utilisation

To bridge the gap between IP created and utilized, the Department is implementing three Schemes *viz.* (i) Command Area Development (CAD) works (ii) Maharashtra Water Sector Improvement Project (iii) Repair, Renovation and Restoration of Water Bodies. The audit findings in respect of these three Schemes are discussed below:

5.2.8.1 Command Area Development works

The Command Area Development works were undertaken by WRD under a Centrally Sponsored Scheme. The Scheme was restructured and renamed by

[150] The cropped area for Ujjani Project *i.e.* 2,73,298 ha (Command area: 2,24,656 ha and Reservoir: 48,642 ha) was calculated as per the approved cropping pattern for the project

[151] As per the project report it was planned that 1,182.36 mcum of water was to irrigate 2,73,298 ha of cropped area *i.e.* an average of 231.15 ha per mcum expected to be irrigated

[152] Perennial crops are planted once and live for years producing many consecutive harvests

[153] Including use for non-irrigation purpose

GoI (April 2004) as Command Area Development and Water Management Programme (CADWMP). The CADWMP includes various components of works *viz.* survey, planning and design and construction of field channels, on-farm development (OFD) works, construction of field intermediate and link drains, training of farmers *etc*. The GoI funding in the form of grant was limited to 50 *per cent* of actual expenditure for all components except training/monitoring component for which the funding was limited to 75 *per cent* of actual expenditure.

An expenditure of ₹ 169.86 crore was incurred on nine projects[154] under CADWMP during 2007-13. The targets and achievement in respect of two components (construction of field channels and construction of field intermediate and link drains) taken up under CADWMP during 2010-13 is given in **Table 5.7**.

Table 5.7: Target and achievement under CADWMP

Component of work	Target (in ha)	Achievement (in ha)	Shortfall percentage
Construction of field channels	87484	34926	60.07
Construction of field intermediate and link drains	43052	23220	46.07
Source: Progress reports of each project			

Audit observed the following:

- The shortfall in construction of field channels ranged between 30 and 76 *per cent* during 2010-13. The shortfall in construction of field intermediate and link drains ranged between 56 and 63 *per cent* during 2010-13 **(Appendix 5.7)**;
- During the period 2005-06 to 2009-10, 23 land development works awarded at a cost of ₹ 2.92 crore (Kukadi project) for development of 3,098.42 ha of CCA between March 2007 and December 2010 were incomplete. The delay in completion of the works deprived the beneficiaries of irrigation benefits.
- As per para 5.3.4 of OFD Manual, the construction of field channel finds utility when these are constructed just ahead of first arrival of canal water. A long time gap between construction of field channels and actual use damages the channels and renders the same unserviceable. Audit noticed that 27 field channels and structure works under CAD were completed in 2010 after incurring an expenditure of ₹ 2.63 crore covering 195.17 ha of command area in Solapur district (Kukadi project). However, the non-lining of LBC and consequent non-release of water into the distribution network *i.e.* from canal to distributaries to minors and field channels for feeding the command area, led to growth of trees and grass thereby rendering the field channels unusable.

[154] Khadakwasla, Kukadi, Krishna, Chaskaman, Dhom Balkwadi, Bhima, Nandur Madhmeshwar, Lower Wuna and Upper Penganga

Minor 86 under Kukadi LBC

- Wasteful expenditure of ₹ 28.80 lakh was incurred on outlets and field channels which were not traceable and as a result, water could not reach the farmers (Kukadi and Chaskaman projects). This was noticed in joint inspection (March 2013) by audit with the officers of WRD.

Field Channel on outlet left I of Minor 86 on Kukadi Left Bank Canal

Field Channel on outlet right of Sub-minor 3 on Minor 90 of Kukadi Left Bank Canal

Field Channels to Direct outlet 10 on Distributary 22 of Chaskaman left bank canal

5.2.8.2 Maharashtra Water Sector Improvement Project

Completed irrigation projects often suffer from poor IP utilisation due to various reasons such as, non-maintenance of dams and canals and high siltation. In 2001, WRD identified 2,243 completed irrigation projects having an IP of 26 lakh ha with poor IP utilisation, for rehabilitation under Maharashtra Water Sector Improvement project (MWSIP) in three phases. The

rehabilitation of the projects involved works for improving the water service delivery by rehabilitation/repair of main canals, distributaries, minors *etc.*

The first phase of the project in 2005 aimed at structurally rehabilitating 236 projects[155]to ensure the shift in responsibility of management of irrigation systems from being solely that of the Government to a system where water distribution below the head works[156] are managed by Water Users' Associations (WUAs). In order to finance the said project with non-budgetary resources, GoM through GoI signed (August 2005) an agreement with the World Bank. The overall project cost was ₹ 1,859 crore with a loan component of ₹ 1,534.30 crore from the World Bank and ₹ 36 crore was to be contributed by the participating WUAs at ₹ 500 per ha. The residual cost ₹ 288.70 crore was to be borne by GoM from its own resources. The time frame for completion of the project was six years ending 30 September 2011. Audit scrutiny revealed the following:

- In terms of Section 205 of Articles 11 of the agreement, GoM was liable to pay to the World Bank 'Commitment Charges' at the rate of three fourth of one *per cent* ($3/4^{th}$ of one *per cent*) *per annum* on the principal amount of the loan not withdrawn from time to time. Due to delay in award of the contract for canal rehabilitation and dam safety works and formation of WUAs, the projects could not be completed within the stipulated time. Due to slow pace of construction the GoM could utilize only ₹ 1,391.42 crore leaving a balance of ₹ 142.88 crore (9.31 *per cent*) unutilized till June 2013. As a result, GOM had to bear avoidable commitment charges of ₹ 17.91 crore during the period 2005 to 2013 as per provisions of the agreement. WRD stated (April 2013) that works were required to be carried out without affecting the irrigation rotations and there were difficulties in availability of construction material, especially sand, which affected the progress of works. Hence, loan disbursement was not as per schedule and commitment charges had to be paid.
- The WRD revised (August 2012) the estimated cost from ₹ 1,859 crore to ₹ 2,031.77 crore due to non-completion of projects within six years as planned, resulting in increase in cost by ₹ 172.77 crore to be borne by GoM. The project period was extended up to March 2014 by the World Bank on the request of GoM.
- As of July 2013, 1,677 WUAs were formed out of the projected formation of 1,708 WUAs in respect of these 236 projects. As per project agreement, total contribution of ₹ 36 crore was to be recovered from WUAs, but WRD could recover only ₹ 19.70 crore till July 2013. WRD stated (June 2013) that efforts were being made to recover the balance amount from the WUAs.
- As per the Status Report of WRD on MSWIP ending October 2013, of the total 236 projects, canal rehabilitation works were completed in 183 projects (three major, seven medium and 173 minor projects), covering a culturable command area of 3.14 lakh ha (October 2013).

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[155] Culturable Command Area of 6.69 lakh ha

[156] A term used for any structure at the head or diversion point of a waterway

5.2.8.3 Repair, renovation and restoration of water bodies

The GoI, Ministry of Water Resources launched (2005) a Centrally Sponsored Scheme for Repair, Renovation and Restoration (RRR) of Water Bodies which included restoration of lost/reduced irrigation potential. As per the guidelines, water bodies having culturable command area up to 2,000 ha could be taken up under this Scheme[157]. At the district level, a District Level Implementation and Monitoring Committee (DLIMC) under the chairmanship of District Collector was to be constituted for implementation and supervision of the projects under the Scheme.

Scrutiny of records revealed the following:

- Proposals for 741 projects at an estimated cost of ₹ 399.10 crore under phase I of the Scheme was sent by GoM to GoI in October 2010. In anticipation of receipt of GoI share, GoM released lump sum grant of ₹ 100 crore to the IDCs on 31 March 2011 with instructions not to incur any expenditure till further orders.
- GoI's share of ₹ 80.53 crore for 258 projects[158] was released to GoM in October 2011. The AA to these 258 projects, with the objective of restoring irrigation potential of 54,369 ha, was accorded by GoM in November 2011 at an estimated cost of ₹ 135.09 crore (GoI share: ₹ 119.35 crore and GoM share: ₹ 15.74 crore) and orders for utilising ₹ 87.24 crore (out of ₹ 100 crore released in March 2011) was issued in May and June 2012. Work on only 24 out of 258 projects (under the jurisdiction of TIDC and VIDC) had commenced and an expenditure of ₹ 3.97 crore incurred (March 2013). Phase II of the project has not yet commenced.

The Government stated (June 2013) that funds were released in anticipation of approval by GoI and the delay in issuing orders for release of funds was on account of Grampanchyat and Nagarpalikas elections in the State. The reply is not acceptable as release of funds before AA was irregular and resulted in funds being parked with the IDCs and the stated objective of restoring the IP created could also be not achieved. Further, the delay in issuing order for release of funds on account of Grampanchyat and Nagarpalikas elections is not acceptable as the elections were held between February and March 2012. The release of ₹ 100 crore to the IDCs on 31 March 2011 was made to avoid lapse of budgeted fund.

5.2.9 Equity in distribution of water

The command area of a project is divided equally as head, middle and tail reaches. The benefit of irrigation should equitably be given to the beneficiaries in all the reaches to ensure fair distribution of water. The equity performance of the project is measured in terms of actual area irrigated to projected irrigable command area in these reaches.

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[157] For special category States and for projects benefitting drought prone/tribal/naxal affected areas, the funding pattern is 90:10 between the Centre and the State and in others, the funding pattern is 25:75 between the Centre and the State

[158] Approvals for balance 483 projects were not received from GoM

Scrutiny of benchmarking report for the year 2009-10 in 2010-11 revealed that:

- In 31 of 50 major projects and 104 of 191 medium projects, the distribution of water was not equal (2009-10) in all the reaches. Further, during 2010-11, in 31 of 50 major projects and 122 of 177 medium projects the distribution of water was not equal in all the reaches.
- In five of 50 major projects and 36 of 191 medium projects there was no distribution of water to the beneficiaries in the tail reaches (2009-10). In one of 50 major projects and 31 of 177 medium projects there was no distribution of water to the beneficiaries in the tail reaches (2010-11).

One of the reasons which could be attributed to inequity in the distribution of available water was inefficiency in the canal conveyance as discussed in **paragraph 5.2.7.1** of this Report.

The Government stated (October 2013) that a workshop on Benchmarking Reports, Water Audit Reports and ISRs was conducted in September 2013 and based on the outcome of the workshop necessary action would be taken to streamline the issues.

5.2.10 Water Quality

As per the State Water Policy 2003, the quality of water resources of the State shall be protected to preserve their usability in a sustainable manner for the people of the State.

Ujjani dam with a gross reservoir capacity of 3,320 mcum was completed in 1980 and the water was being utilised for irrigation and non-irrigation purposes for Pune, Ahmednagar and Solapur districts. Untreated domestic effluents of Pune city were drained into Mutha and Mula rivers while effluents of Pimpri-Chinchwad city were drained into Pawana river. The effluents of these rivers flow into Ujjani dam, thereby polluting its dam water. Several villages[159] situated alongside the banks of the backwater of Ujjani dam were utilising the dam water for irrigation and non-irrigation including drinking purpose. Total quantities of untreated water drained from Pune and Pimpri-Chinchwad cities are detailed in **Table 5.8**.

Table 5.8: Water drained without treatment from Pune and Pimpri-Chinchwad cities

City/ Corporation	Total quantity of waste water generated (in MLD)	Total quantity of waste water treated (in MLD)	Quantity of waste water drained without treatment (in MLD)
Pune	744	527	217
Pimpri-Chinchwad	290	180	110
Total	**1034**	**707**	**357**
Source: Information furnished by the Maharashtra Pollution Control Board			

A project taken up by Pune Municipal Corporation to recycle the effluents before release into New Mutha RBC was incomplete due to which untreated water continued to be released into the Mula and Mutha rivers. The high level of pollutants could adversely affect the Ujjani dam.

[159] Villages towards the upstream of Karmala, Indapur, Barshi, Kurduwadi and at downstream towards Pandharpur, Mangalwedha, Sangola and Solapur area are using water for domestic purpose

The test reports (September 2009) of water samples collected (September 2009) by Maharashtra Pollution Control Board (MPCB) at four[160] places indicated that the alkalinity and pollutants were beyond permissible limits, rendering the water unfit for domestic consumption unless properly treated by respective local bodies.

The MPCB filed (2009-10) a criminal suit against the two[161] local bodies and three industries for pollution, under Water Pollution Act, 1974 and submitted (August 2010) the Bhima River Pollution Control Action Plan through the Pune Collector to the Environment Department, GoM. Notwithstanding the action taken by MPCB, discharge of effluents continues to pollute the Ujjani dam.

In the exit conference, Principal Secretary (CADWM) stated (July 2013) that MPCB has conducted basin-wise study of Bhima river and that Pimpri Chinchwad and Pune Municipal Corporations were taking necessary measures.

The Government stated (October 2013) that the Environment Department, GoM is being requested to take necessary measures.

[160] Diksal, Khanota, Kumbhagaon and Pargaon villages in the backwaters of Ujjani dam
[161] Pune and Pimpri-Chinchwad

Chapter 6

Levy and Collection of Water Charges

Chapter 6

Levy and Recovery of Water Charges

6.1 Introduction

The levy and collection of water charges is governed by the Maharashtra Irrigation Act, 1976 (MIA) and Maharashtra Water Resources Regulatory Authority (MWRRA) Act, 2005. Supply of water for irrigation and non-irrigation purposes is mainly from the reservoirs, tanks, flowing canals of the irrigation projects or from any part of the rivers including its tributaries, streams, lakes, natural collection of water, lift irrigation works or from wells under the command of irrigation projects as notified by the Government. The water for non-irrigation purposes is supplied mainly to industries and for drinking purpose.

The per hectare water rates for irrigation purpose are levied from time to time on the basis of seasonal cropping pattern except water supplied to Water Users Associations (WUAs)[162] which is on volumetric basis. For non-irrigation purposes, the rates are based on the quantity of water supplied and the source of lifting the water. Up to September 2010, the water charges were prescribed by the WRD and from October 2010 onwards, the water charges were fixed by MWRRA.

Performance Audits on 'User charges for water supply from irrigation projects' appeared in the Reports of the Comptroller and Auditor General of India for the years 2002-03 and 2008-09. The Report for the year 2002-03 was discussed in the year 2008-09 and recommendations were made by the Public Accounts Committee (PAC) for which the Action Taken Note was awaited (June 2013) from the GoM. The Report for the year 2008-09 is yet to be discussed by the PAC (July 2013).

6.2 Arrears of water charges

As per the Irrigation Status Report for the year 2010-11[163] and information furnished by the WRD for the period 2011-13, the arrears of water charges during 2007-08 to 2012-13 stood at ₹ 1,275.31 crore, as shown in **Appendix 6.1**. Scrutiny in audit revealed the following:

- The arrears of water charges increased from ₹ 748.90 crore as at the end of March 2008 to ₹ 1,275.31 crore by the end of March 2013 *i.e.* an increase of 70.29 *per cent*.
- The arrears of water charges for irrigation purpose increased by 30.63 *per cent* during the period 2007-13 while for non-irrigation purpose the arrears increased by 138.56 *per cent* during the same period.
- The arrears as a percentage of amounts recoverable were highest in Aurangabad and Amravati region at 80.99 *per cent* and 73.79 *per cent* respectively as at the end of March 2011[164].

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[162] Water Users Associations are formed under the Maharashtra Management of Irrigation System by Farmers Act, 2005 (MMISF Act)

[163] Figures for 2007-11 were obtained from the ISR for the year 2010-11

[164] Irrgiation Status Report for the year 2011-12 and 2012-13 showing region wise arrears position was not prepared by the WRD

- The opening balance during the year did not tally with the closing balance of the preceding year during 2007-13. The difference ranged between (-) ₹ 7.82 crore (2011-12) and ₹ 120.55 crore (2008-09) as shown in **Appendix 6.1**. This needs to be reconciled.

- As per Section 11 (d) of the MWRRA Act, 2005, the water charges shall reflect the full recovery of the cost of the irrigation management, administration, operation and maintenance of the water resources project. Water charges were reduced[165] with effect from October 2010 by MWRRA with reference to the rates fixed by WRD in July 2006. While fixing the revised rates, MWRRA gave highest weightage to affordability (60 *per cent*) followed by accessibility (20 *per cent*) and quality and timeliness (20 *per cent*) in apportionment of operation and maintenance costs. However, reduction of water charges by MWRRA did not result in improvement in recovery. The percentage of shortfall in recovery against the total dues increased from 54.43 *per cent* in 2007-08 to 71.59 *per cent* in 2012-13.

- The PAC in its 12th Report (June 2009) on paragraph 6.6.7 of the Report of the Comptroller and Auditor General of India (Revenue Receipts) for the year 2002-03 had recommended fixing of responsibility on the officers concerned who had failed to effect the recoveries. However, huge arrears of water charges which stood at ₹ 1,275.31 crore at the end of March 2013 showed that much is required to be done to effect the recoveries.

The Government stated (August 2013) that levy of water charges was exempted from 2009 on irrigation through wells located in the command areas but the farmers stopped paying the water charges for earlier periods also. In respect of use of water for non-irrigation purposes, the Government further stated that recoveries could not be made due to unwillingness of water users as also due to sickness and closure of industries. The Government also added that efforts were underway for speeding up the recovery through personal contacts, timely issue of notices, periodical meetings held at Government level for review of situation and issue of guidelines to ensure maximum recovery.

As there was no improvement in the recovery of arrears despite meetings and issue of guidelines, it was clear that Government will have to find ways to implement its decision more effectively.

6.3 Audit findings

The observations on test check of records of six management divisions and nine divisions of the five IDCs are as follows.

6.3.1 Incorrect application of water tariff

The MWRRA issued orders in May 2011 fixing volumetric basic rates for bulk water supply (effective from October 2010) including the rates for different seasons and regions.

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[165] The rates of water charges were reduced for all the bulk users except for Municpal Corporations getting water supply from assured sources and industries getting water from partially assured sources like KT weir, free flowing river *etc*.

Water charges for industrial use are fixed according to the source of supply and the type of industry. Further, in respect of industries using water as raw material, water charges are higher than the rate of water used by process industries. In addition, concessional rates are also allowed based on the conditions prescribed. For domestic use, the rates are fixed according to source of supply and the type of bulk user.

During test check of bills raised by the management divisions and divisions of the IDCs, audit noticed short-recovery of water charges on various counts amounting to ₹ 10.42 crore, as detailed below:

- Short-recovery of water charges (₹ 1.31 lakh including local cess) from MIDC (Akola) was noticed in Jalgaon Irrigation Division as bills were raised (March 2011 to June 2011 and March 2012) at ₹ 38 per unit[166] instead of the applicable rate of ₹ 48 per unit. The Government stated (August 2013) that an amount of ₹ 1.03 lakh had been recovered in March 2013. Details of recovery of the balance amount of ₹ 0.28 lakh was awaited (July 2013).

- The tariff order (issued by the WRD in July 2006 and by MWRRA in May 2011) provided for higher rates of water charges if the source of supply was from canal or from the river flowing below the dam, as against the supply made directly from the dam. Three bulk users namely M/s Supreme Industries (Waghur Dam Division), Parle International (Raigad Irrigation Division) and Reliance Infrastructure Limited (Bhatsa Canal Division) did not draw water from the original dam source but from downstream source. However, the rate applicable for supply of water directly from the dam was applied, resulting in short recovery of water charges aggregating ₹ 5.20 crore including local cess for various periods between June 2007 and March 2012.

The Government stated (August 2013) that the distance between the point of lifting in the river and the dam on the upstream was more than eight kilometers which was acting as a free catchment and providing additional water in the river during rainy season and thus, treated as a river having no dam on the upstream. Hence, there was no short-recovery.

The reply is not acceptable as the GR of July 2006 provides for levy of water charges at lower rates where no dam is constructed anywhere on the upstream. Further, the GR also does not draw reference to the distance between point of lifting and the dam on upstream. It is also pertinent to mention that in case of Reliance Infrastructure Limited, on the basis of audit observation, demand for differential amount of ₹ 3.66 crore up to March 2013 was raised of which, ₹ 1.75 crore had already been recovered.

- Tariff orders (2006 and 2011) provided for concessional rates for the industries recycling water thereby reducing their demand for water to the extent of at least 25 *per cent.* M/s Liberty Oil Mills, Bamane, Shahapur, District Thane was allowed 10 *per cent* concession on water charges though the condition of recycling of water and consequent reduction in demand for water to the extent of at least 25 *per cent* was not fulfilled.

[166] One unit is equivalent to 10 cubic metres

This resulted in short-recovery of ₹ 3.59 lakh including local cess for the period April 2007 to March 2011. The Government stated (August 2013) that due to oversight concession was allowed and an amount of ₹ 3.50 lakh had been recovered. Details of recovery of the balance amount was awaited (November 2013).

- M/s Rashtriya Chemicals and Fertilisers Limited, Thal and Bhushan Steel and Stripes Ltd. Savroli, Taluka Khalapur under Raigad Irrigation Division, Kolad (RID) used recycled water and thus, reduced their demand for water but no concessions were given to them despite their claim in January 2008 and January 2012 respectively. The Government stated (August 2013) that the matter was under process. As the issue has been pending for a period ranging between 19 to 55 months, the same needs to be expedited so as to encourage other industries to reduce their consumption of water through recycling.

- Scrutiny of bills of five bulk users of RID and two bulk users of Bhatsa Canal Division, Shahapur revealed incorrect application of tariff by MWRRA for various periods between October 2010 and October 2011, resulting in short-recovery of ₹ 5.17 crore including local cess. The Government stated (July 2013) that rates were applied correctly as per MWRRA orders dated 30 May 2011 effective from 15 October 2010. Reply is not acceptable as the water bills raised clearly showed application of incorrect rates.

6.3.2 Non-ascertainment of actual end use

In the agreements entered into between the Department and the bulk users, the percentage at which the water charges are to be levied with respect to quantity of water supplied for domestic and industrial use are decided. Test check of six agreements revealed that the agreed percentages for supply of water for domestic and industrial use were 90 and 10 *per cent* for Brihanmumbai Municipal Corporation (BMC) and 99 and one *per cent* for Thane Municipal Corporation (TMC). In cases of Vasai-Virar Municipal Corporation, Jalgaon Municipal Corporation (JMC), Maharashtra Jeevan Pradhikaran (MJP), Amravati and City and Industrial Development Corporation Limited, Navi Mumbai, the agreements stipulated for 100 *per cent* domestic use. Scrutiny in audit revealed the following:

- There was no mechanism in place to ascertain that the actual percentage of use of water by the bulk users was as per the agreements. Waghur Dam Division was supplying water to JMC, which in turn was supplying water to Jain Irrigation Systems, an industrial unit. However, JMC was paying water charges for 100 *per cent* domestic use. Similarly, in the city of Amravati, though MJP was also supplying water to industries, 100 *per cent* domestic rates were applied.

- The percentages fixed in the agreements do not take into account the end use of water for industrial purpose though the water charges for industries

using water as raw material was higher[167] than the rates prescribed for process industries. The Government was not aware of the actual use of water by the bulk users as no mechanism to watch the same had been prescribed.This resulted in recovery of water charges at a uniform rate irrespective of actual use. Hence, there was a need to prescribe periodic returns to ensure that water charges were paid by the bulk users at the appropriate rates.

The Government accepted (August 2013) the audit observation and stated that it had raised an additional demand of ₹ 55.35 lakh in respect of water supplied to Jain Irrigation Systems. In case of MJP supplying water to the city of Amravati, the Government confirmed that water was supplied to industries also but 100 *per cent* domestic rates were applied. The Government further stated that guidelines to access the end users directly for the purpose of charging bills from the bulk users was under consideration.

6.3.3 Non-inclusion of component of capital cost in water tariff

As per the provisons of IDC Acts, determination and levy of water charges shall be such that water charges so recovered shall be sufficient to cover at least the interest charges on repayment of the loan raised from the open market. However, as per Section 11(d) of the MWRRA Act, 2005, water charges shall reflect the full recovery of the cost of the irrigation management, administration, operation and maintenance of water resources project. Thus, MWRRA Act, 2005 does not take into consideration the recoupment of interest charges on repayment of loans raised from the open market while determining the tariff. This was confirmed by MWRRA in November 2012.

In the exit conference, the Principal Secretary, WRD stated (July 2013) that the point raised by audit would be looked into and addressed during the next tariff order.

6.3.4 Recovery of penalty from water polluting industries

Under Section 12 (5) of the MWRRA Act, 2005, MWRRA was required to support and aid the enhancement and preservation of water quality within the State in close co-ordination with the State agencies by following the principal '*the person who pollutes shall pay'*. Further, as per paragraph 4.1.3 of Water Tariff Orders issued (May 2011) by the MWRRA, every industry was required to treat the effluents to the prescribed standards fixed by MPCB before release into natural water course, failing which rate equal to twice the applicable rate of water charges was leviable.

Audit observed that the existing agreements with the bulk users were not modified to include the penal provisions prescribed by MWRRA in the tariff order of May 2011. Further, WRD also did not obtain any data from MPCB in order to penalize the polluting industries.

[167] The water charges for industries using water as raw material was five times the rates prescribed for process industries as per the tariff order effective from October 2010 and was more than five times from September 2006 to September 2010

The Government stated (August 2013) that action against polluting industries was to be taken by MPCB and cases coming to its notice were referred to MPCB for necessary action.

The reply is not tenable as the WRD was required to levy penalty in addition to any other action that the MPCB may separately take.

6.3.5 Non- enforcement of penal provisions

WRD issued (29 June 2011) area-based water tariff order for supply of water for agriculture use based on the criteria for determination of bulk water tariff fixed by MWRRA. The rates were revised retrospectively from 15 October 2010. The order provided that farmers having more than two children born after one year of the enactment of the MWRRA Act (*i.e.* after 8 June 2006) were to be charged 1.5 times the applicable rate of water charges. However, audit observed that data regarding farmers having more than two children born after 08 June 2006 was not maintained for levy of penal water charges.

The Government stated (August 2013) that henceforth, information regarding number of children in respect of farmers would be collected.

Chapter 7

Conclusion and Recommendations

Chapter 7

Conclusion and Recommendations

7.1 Conclusion

Maharashtra is a water stressed State and depends heavily on rainfall and the vagaries of monsoon cause frequent drought in many areas of the State. The Water Resources Department (WRD) established five Irrigation Development Corporations (IDCs) for effective management of the available water resources in the five river basins in the State.

The State Water Policy of 2003 envisaged formation of River Basin Agency (RBA) for each river basin which were to be responsible for preparation of integrated river basin plan. However, the IDCs, which were designated as RBAs, did not prepare the river basin plans thus, leading to non-preparation of the State Water Resource Plan (SWRP) for planning and development of water resources in the State. In the absence of SWRP, the clearance to the irrigation projects granted by Maharashtra Water Resources Regulatory Authority (MWRRA) failed to address the fragmented and isolated approach to surface and ground water development. The need for prioritising the irrigation projects emphasised from time to time through Governor's Directives and recommendations of High Power Committee and Planning Commission was not followed leading to thin spreading of financial resources among many projects, time and cost overruns and delay in creation of the envisaged irrigation potential (IP). The WRD was saddled with 601 ongoing projects as on June 2013 and their estimated balance cost (₹ 82,609.64 crore) was nine times the capital grant of WRD for the year 2012-13.

Projects were taken up without proper surveys, environment and forest clearances, acquisition of requisite land and non-rehabilitation of project affected persons as a result, there was enormous increase in the cost of the projects and delays in their completion as well. There were several instances where the Manual provisions and contract terms and conditions were violated resulting in granting of undue benefits to the contractors and incurring of avoidable extra expenditure.

The Dam Safety Organisation (DSO) did not follow the criteria for selection of dams for test inspections. At the end of March 2013, 348 large dams (out of 1,171) remained uninspected for more than 10 years. Compliance to deficiencies pointed out by DSO was poor. There were instances where dam works were continued by the Construction Divisions despite issuance of Red Inspection Slips by the Quality Control Divisions, signifying immediate stoppage of works.

As against 48.26 lakh ha of IP created, the IP utilized was only 32.51 lakh ha *i.e.* 67.36 *per cent*. The poor utilisation of IP was due to inadequate maintenance of dams and canals, siltation, inefficiency in canal conveyance, incomplete command area development works, supply of water to perennial crops requiring more water *etc*. The cropping pattern planned at the time of project planning and the actual cropping pattern followed in Ujjani major

project revealed wide variations that adversely affected the efficiency of water use.

The monitoring and internal controls in the WRD was weak. There was no well defined system of granting Administrative Approvals and Revised Administrative Approvals to the irrigation projects by the IDCs. As a result, a large number of projects were approved and implemented in the non-backlog districts in violation of the Governor's directives. The Governing Councils of the IDCs did not hold the requisite number of monthly meetings during 1996-2013, in violation of the IDC Acts. The Management Information System was also poor due to discrepancies in various reports prepared by the WRD.

The MWRRA did not determine the sectoral allotment of water, though empowered under the MWWRA Act, 2005, for a period of six years from its establishment. The MWRRA also did not determine the priority of equitable distribution of water during periods of scarcity.

There was significant increase in the arrears of water charges (70 *per cent*) for irrigation and non-irrigation purposes during 2007-13.

7.2 Recommendations

The Government may:

- give priority to preparation of river basin-wise plans as well as formulation of State Water Resource Plan for ensuring better management of water resources;
- avoid spreading out of resources and prioritise funding of projects so that they are completed in time, reduce escalation in time and costs and provide the benefits planned for;
- ensure that scope of the irrigation project is determined after adequate survey and design approval and work commences only after acquisition of required land, rehabilitation of project affected persons and forest/environmental clearances;
- ensure that estimates for works are prepared using the relevant Schedule of Rates with due consideration to the available exemption of duties and taxes;
- ensure that system of contract management is robust and works are executed in accordance with the Manual provisions and contractual terms and conditions;
- make efforts to bridge the gap between the irrigation potential created and utilised by focusing on command area development works, carrying out timely repairs and maintenance of irrigation projects and allocating adequate funds for the maintenance of created assets;

- formulate suitable selection criteria for periodical inspection to maintain the health of the dams. It also needs to be ensured that required manpower and funds are allocated to the Quality Control Organisation so that shortfalls in inspection of dam works are eliminated;
- ensure that the arrears in collection of water charges are liquidated at the earliest, correct tariffs are applied for determination of water charges and the conditions for grant of concessions in water charges to the industrial users are duly complied with; and
- ensure that data on irrigation potential created and utilised, water storage in dams, usage of water for various purposes, evaporation losses from dams *etc.* are accurate.

(MALA SINHA)
Principal Accountant General (Audit)-I,
Maharashtra

Mumbai,
The 06 May, 2014

Countersigned

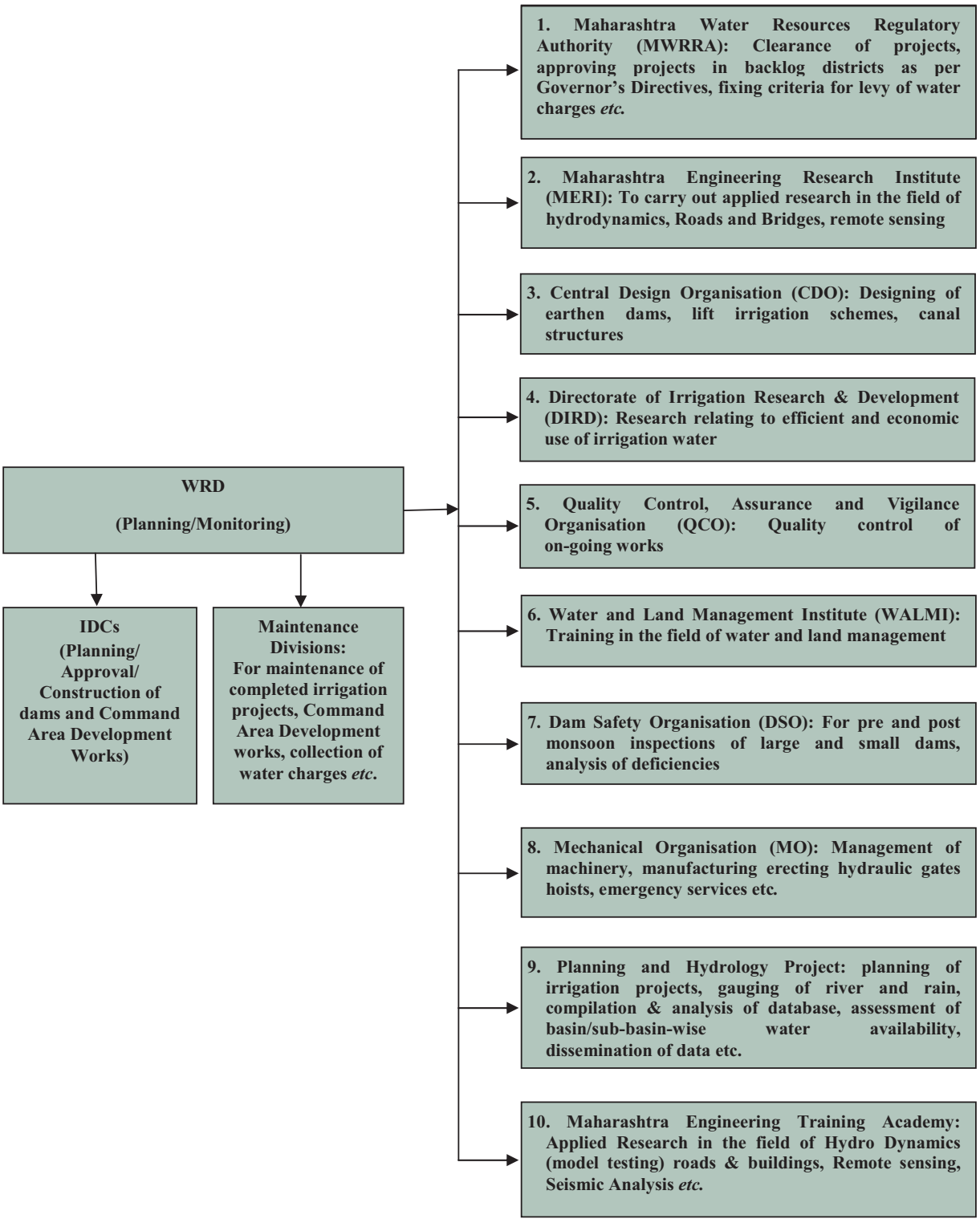
(SHASHI KANT SHARMA)
Comptroller and Auditor General of India

New Delhi,
The 08 May, 2014

Appendices

Appendix 1.1
(Reference: Paragraph 1.2, Page 3)

Chart 1: Organisational structure and functional responsibilities



Appendix 1.2
(Reference : Paragraph 1.2; Page 3)
Glossary of terms used in the performance audit

Sr No.	Acronym	Meaning
1	2	3
1.	Article 371 (2) of the Constitution Of India	(2) Notwithstanding anything in this Constitution, the President may by order made with respect to the State of Maharashtra or Gujarat, provide for any special responsibility of the Governor for: (a) the establishment of separate development boards for Vidarbha, Marathwada, and the rest of Maharashtra or, as the case may be, Saurashtra, Kutch and the rest of these boards will be placed each year before the State Legislative Assembly; (b) the equitable allocation of funds for developmental expenditure over the said areas, subject to the requirements of the State as a whole.
2.	Aquaduct	Where the bed level of the canal is higher than the high flood level of the drainage then the cross drainage work is called aqueduct. When irrigation channels have to cross streams or drains in an uneven country the works necessary to dispose of these drains are called cross drainage works.
3.	Backlog	Backlog refers to the regional disparity in the three regions of the State *viz*. Vidarbha, Marathwada and Rest of Maharashtra. Nine sectors like irrigation, roads, rural electrification *etc.* were chosen for estimation of backlog. As per the Indicators and Backlog Committee appointed (1995) by the Hon'ble Governor, percentage of created IP in the State *vis-à-vis* the net sown area was 35.11 *per cent*. Districts with created IP less than 35.11 *per cent* were considered as backlog districts.
4.	Colgrout masonry	Colgrout masonry is a new technique for construction of masonry for massive structures like gravity dams, weirs, barrage, foundation, retaining walls etc which satisfies the requirement of strength, durability and at the same time being impervious and particularly suitable for water retaining structures in Indian conditions.
5.	Command Area Development	Envisages execution of on-farm development works like field channels, land levelling, field drains and conjunctive use of ground and surface water; the introduction of Warabandi, or the rotational system of water distribution to ensure equitable and timely supply of water to each holding; and evolving and propagating crop patterns and water management practices appropriate to each command area.
6.	Cross drain	Cross drain is a drain to collect seepage from the longitudinal drain and to collect it in the toe drain.
7.	Culturable/Cultivable Command Area	The area which can be physically irrigated from a Scheme and is fit for cultivation by a canal system or by lift.
8.	Cut-off trench	An excavation in the base of a dam or other structure filled with relatively impervious material to reduce percolation.
9.	Dead storage capacity	The portion of a water storage capacity that is equal to the volume of water below the level of the lowest outlet (the minimum supply level). This water cannot be accessed under normal operating conditions.

Appendix 1.2 (contd.)		
1	**2**	**3**
10.	Downstream of dam	An area down the dam built.
11.	Drip irrigation	Drip irrigation system delivers water to the crop using a network of mainlines, sub-mains and lateral lines with emission points spaced along their lengths. Each dripper/emitter, orifice supplies a measured, precisely controlled uniform application of water, nutrients, and other required growth substances directly into the root zone of the plant.
12.	Field Channels	Small channels which receive water through outlets fixed in the banks of distributaries or minors to the field.
13.	Gorge filling	Filling the river portion of dam embankment.
14.	Gross Command Area	The total area covered by an irrigation project including uncultivable area under habitation, roads, tanks, waste land, forest land *etc*.
15.	Gross cropped area	Gross cropped area is the sum of net sown area and the area sown more than once in an agricultural year.
16.	Guide bunds	Provided for the purpose of guiding the river flow pass the diversion structure without causing damage to it and its approaches.
17.	Head regulator	Construction at the off-take of a channel subsidiary to a main canal. Piers with grooves are provided for the use of shutters to regulate the water flow for distribution.
18.	Head work	The works constructed at the off take of a main canal from the river; includes the weir on the river, the dam at the storage site *etc*.
19.	Hearting and casing	A zone of impervious earth within a zoned earthen or rock fill dam while casing zone is the outer side of hearting zone placed with pervious soils so as to protect the hearting zone.
20.	Hot weather	The hot weather season commences from March 1 to June 30.
21.	Inverted plum bobs	Used to measure the relative displacement between the dam bottom and the foundation base rock.
22.	Irrigable Command Area	It is the part of CCA which can be irrigated by the canal system less the area which cannot be irrigated because of high elevation.
23.	Irrigation Potential created	The total gross area proposed to be irrigated under different crops during a year by a scheme. The 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.
24.	Irrigation Potential projected	The irrigation potential planned to be created on completion of an irrigation project.
25.	Irrigation Potential utilised	The gross area actually irrigated during reference year out of the proposed gross area to be irrigated during the year.
26.	Kharif	The Kharif season commences from July 1 to October 14. Paddy and groundnut are examples of Kharif crops.
27.	K T Weir	Kolhapur-type weir is a low level dam built across a stream for storage of water.
28.	Lift Irrigation Scheme (LIS)	A type of irrigation in which irrigation is provided through water raised by pumps.

Appendix 1.2 (contd.)		
1	**2**	**3**
29.	List I	The Seventh Schedule (under Article 246) of the Constitution of India provides a Union list termed as List I. Entry 56 of List I provides that "Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest".
30.	List II	The Seventh Schedule (under Article 246) of the Constitution of India provides a State list termed as List II. Entry 17 under List II of Seventh Schedule provides that "Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of Entry 56 of List I".
31.	List III	The Seventh Schedule (under Article 246) of the Constitution of India provides a Concurrent list termed as List III.
32.	Live storage capacity	Live storage capacity means the reservoir capacity excluding the dead storage capacity.
33.	Major project	Having culturable command area above 10,000 ha.
34.	Medium project	Having culturable command area above 2,000 ha and up to 10,000 ha.
35.	Micro irrigation	Micro irrigation is a system of tubes and drippers which deliver water directly to the base of each plant or crop to use water with much greater efficiency than that provided by conventional sprinkler systems.
36.	Minor	A branch of distributary of any canal.
37.	Minor project	Projects having irrigable command area from 251 ha to 2,000 ha.
38.	Net Present Value	The discounted sum of ecosystem goods and services that would flow from a forest over a period of time net of costs incurred. In the context of diversion of forests land to non-forestry, NPV means that the loss of value of the forest resources to the stakeholders or the users at the time of diversion of forest land.
39.	Net Sown Area	It is the total area sown with crops. Area sown more than once is counted only once.
40.	Outlet	An opening of a capacity not exceeding 30 litres per second to serve a block of land of approximately 40 hectares through which water is delivered into a field-channel or directly into any land.
41.	Perennial crops	Perennial crops are planted once and live for years producing many consecutive harvests.
42.	Plumb bobs	Used to measure relative displacement between two reference points of a dam structure.
43.	Quarry spual	Small chips of stones available from quarry at the time of blasting for rubble.
44.	Rabi	The rabi season commences from October 15 to February 28/29. Jowar and Wheat are examples of Rabi crops.
45.	SRE	Standard Rabi Equivalent - water required for an area having different crops against water required for equivalent area of Jowar crop in Rabi season.
46.	Reservoir	A body of water collected and stored behind a dam.

Appendix 1.2 (concld.)		
1	**2**	**3**
47.	Raising main	It is a structure used to raise or lift water from reservoir/canal with the help of pumping machinery in a lift irrigation system.
48.	Rock toe	Junction of the upstream or downstream face of an embankment with ground surface.
49.	Saddle dam	An auxiliary dam constructed to confine the reservoir created by a primary dam either to permit higher water elevation and storage or to limit the extent of reservoir for increased efficiency.
50.	Shaft Rod	A rotating rod which through its motion operates the gate of head regulator.
51.	Sluice Gates	A barrier sliding in grooves that are set in the sides of the waterways, to allow the water flow under it.
52.	Spillway	A passage for the flow of surplus or waste water in a weir or conduit.
53.	Stone pitching	It is a protection provided for the embankment slopes against erosion by waves of water or rain water.
54.	Tail channel	End portion of a channel.
55.	Toe drain	A trench with filter material laid along the downstream toe of the dam to collect seepage from horizontal filter or inner cross drains and take it to natural drain.
56.	Trough	A bridge on the canal for passage of water.
57.	Upstream	An area above the dam built.
58.	Waste Weir	Channels used to dispose of excess water from the channel.

Appendix 1.3
(Reference : Paragraph 1.4; Page 6)
Statement showing the list of the projects test-checked

Major	Medium	Lift Irrigation Schemes	Minor
		MKVDC	
1. Urmodi	**1.** Pimpalgaon Dhale	**1.** Tembhu	**1.** Nivakane
2. Dudhganga	**2.** Dhamni	**2.** Janai Shirsai	**2.** Kalgaon
3. Tarli	**3.** Kudali		**3.** Ambewadi
4. Chaskaman	**4.** Sina Medium Project Bhosekhind[168]		**4.** Kitwad No. 2
	5. Uttarmand		
	6. Chillewadi **(Please see Note 2)**		
		KIDC	
5. Bhatsa	**7.** Hetwane		**5.** Shirsadi
6. Surya	**8.** KorleSatandi		**6.** Otav
	9. Nardave **(Please see Note 2)**		
			7. Talere
			8. Dedonwadi
			9. Virdi
			10. Roshani
			11. Kondhane **(Please see Note 2)**
		VIDC	
7. Upper Wardha	**10.** Purna	**3.** Purna Barrage No. 2 LIS	**12.** Jamuna Sonwals
8. Lower Wardha	**11.** Katepurna Barrage	**4.** Sondyatola LIS	**13.** Kumarpind
	12. Utawali		**14.** Kali Doulakhan
			15. Nimgaon
			16. Dorapgaon
			17. Lower Dyanganga
			18. Sirsa
			19. Jambnalla
			20. Pangrabandi
			21. Antargaon
			22. WaraJehangir
			23. Raigad
			24. Chikhali
			25. Bewartola
			26. Dagad Parwa
			27. Sukli
			28. Shahapur Large Minor
			29. Chandas Watoda
		TIDC	
9. Punad	**13.** Bahula	**5.** Varangaon Talvel Parisar LIS	**30.** Matrannalla
10. Waghur Project	**14.** Kamani Tanda	**6.** Khurha Vadhoda Islampur LIS	**31.** Pimpri Dhambhurni

[168] Hiranyakeshi (Ambehol) selected through stratificed sampling method was replaced with Sina Medium Project (Bhosikhind) to represent Ahmednagar district and also to avoid representation of multiple number of projects from Kolhapur district (Hiranyakeshi (Ambehol) and Dhamini)

Appendix 1.3 (concld.)			
Major	**Medium**	**Lift Irrigation Schemes**	**Minor**
	15. Prakasha Barrage		**32.** Dhanoli
	16. Lower Panzara (Akkalpada)		**33.** Sur
			34. Kag
GMIDC			
11. Upper Pravara	**17.** Upper Manar Project	**7.** LIS on Lower Terna Project	**35.** Borsuri
12. Shankarraoji Chavan - Vishnupuri	**18.** ShiwnaTakli	**8.** Mula Bhambori Pipe canal & Pump house – Lift Irrigation	**36.** Ghati
			37. Pimpalwadi
			38. Titvi
			39. Renapur Sudha
			40. Talani LMI
			41. Sillegaon
			42. Khari LMI
			43. Hastur Tanda
			44. Ambit
			45. Kumbhaphal
			46. Waldevi LMI
			47. Deolala LMI
			48. Dhapegaon
			49. Musabhaderayani

Note 1: Selection of projects in respect of KIDC was done excluding the projects covered in the performance audit included in the C&AG Report of 2009-10.

Note 2: Nardave and Kondhane projects under KIDC and Chillewadi under MKVDC were selected on risk assessment.

Appendix 2.1 ***(Reference :Paragraph 2.5; Page 15)*** **Extract of 34th Governing Council meeting dated 11 June 2003**		
Priority No.	**Principle for prioritization and project names under the category**	
1	**Category A**	Those major & medium projects which are in advanced stages and on which with comparatively less expenditure, considerable storage capacity could be created and those projects the execution of which is mandatory from safety angle. (Urmodi, Tarli, Sina Kolegaon, Dhom Balkewadi, Nira Deoghar, Gunjawani, Bhama Askhed major projects and such ongoing medium projects).
2	**Category B 1**	The ongoing projects in which dam work have been completed and on which with comparatively less expenditure on the ongoing canals and distributary works, considerable IP can be created (namely Kukdi, Bhima, Chaskaman, Krishna) were proposed for funding under Central funds.
3	**Category C 1**	Those LIS in respect of which major expenditure has been incurred and on which expenditure incurred was intended to provide irrigation benefits in scarcity/drought prone areas. (Takari, Mhaisal, Tembhu, Janai Shirsai, Purandar, Sina Madha).
4	**Category B 2**	Those LIS on which major expenditure has not been incurred and where it is possible to postpone the works (Jihe kathapur, Barshi, Ekrukh, Ashti, Shirapur, Dahigaon, Wakurde, Krishan stage II, Sina Mahekari, Anala & Shirala *etc.*).
5	**Category B 2**	Such ongoing projects and projects whose dam works have been completed and the works of canals and distributaries can be postponed (Dudhganga, Warna, Bhima-Sina extension canal).

Appendix 3.1

(Reference : Paragraphs 3.1, 3.2.1, 3.2.2, 3.2.3, 3.2.6 and 5.2.1; Pages 25, 26, 28, 29, 37 and 72)

Statement showing the status of the 87 test-checked projects

		Detail of original AA		Details of latest RAA													Status of irrigation potential as on June 2013 (in ha)			
Sr.No.	Name of Project/ Type	Month and Year of AA	Amount (₹ in cr)	No. of times RAA obtained	Month and Year	Amount (₹ in cr)	RAA sought but pending	Expenditure as on June 2013 (₹ in cr.)	Up to date cost as on June 2013 (₹ in cr.)	Cost overrun (₹ in cr.) (Col.9-4)	No of years under execution/ completion up to 31 Oct 2013 (in years)	Reasons for non completion	Whether environmental clerance obtained	Whether forest clearance obtained	Whether forest land acquired	Whether civil land acquired	Projected to be created	Created	Utilised	Whether funded under AIBP/ NABARD
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
M K V D C																				
1	Chaskaman/Major	Dec-73	10.65	2	Jul-03	388.13	728.49	538.10	728.49	527.45	40	A,D	not required	In principal approval obtained	yes	in progress	56096	50604	28320	AIBP
2	Urmodi/ Major	Oct-93	212.08	2	Nov-10	1324.14	0	702.50	1417.75	490.42	20	A,B,C.D	Yes	Yes	yes	No	43870	4783	0	AIBP
3	Tarli/ Major	Feb-96	194.32	3	Sep-10	1057.63	1447.63	816.93	1447.63	622.61	17	A,B,C&D	Yes	Not required	yes	No	19498	7229	866	AIBP
4	Dudhganga/ Major	Sep-65	16.25	3	Jul-11	1712.8	0	700.50	1899.34	684.25	48	A,B	Yes	Yes	yes	yes	74017	39365	38846	No
5	Uttarmand/Medium	Nov-95	34.71	2	Jan-07	123.17	0	107.79	123.16	73.08	18	Work is physically completed in June 2013	not required	Not required	Not required	No	7680	7680	564	AIBP
6	Pimpalgaon Dhale/ Medium	Jun-94	10.01	3	Mar-10	95.39	121.49	99.85	121.49	89.84	19	A,B,D	not required	Not required	Not required	yes	3384	1324	464	NABARD
7	Dhamni/ Medium	Dec-96	120.30	1	Feb-05	320.7	762.25	294.22	833.50	173.92	17	A,B,D,E	not required	Yes	No	No	2100	0	0	No
8	Kudali/ Medium	Aug-96	63.46	1	Nov-07	271.79	449.21	268.37	449.21	204.91	17	A,B,C,D	not required	Yes	Yes	No	8523	0	0	AIBP
9	Kitwad-2/ Minor	Jan-98	9.44	1	Sep-09	21.4	0	20.05	21.40	10.61	15	Completed in June-13	not required	Not required	Not required	yes	876	705	270	NABARD
10	Niwakane/ Minor	Feb-00	8.18	2	Jul-09	48.71	0	34.47	48.71	26.29	13	A,B,C,D	not required	Not required	Not required	No	1020	0	0	NABARD
11	Kalgaon/ Minor	Jan-00	5.57	1	Oct-10	16.78	0	15.10	16.78	9.53	13	A,B,D	not required	Not required	Not required	yes	390	0	0	NABARD
12	Ambewadi/ Minor	Jul-99	11.70	1	Jun-09	25.23	0	22.62	25.23	10.92	14	A,B,E	not required	Yes	yes	yes	500	500	60	NABARD
13	Bhosekhind/ Medium	Dec-00	83.04	1	--	0	153.64	130.38	153.64	47.34	11	Work is physically completed in 2011	not required	Not required	Not required	yes	8445	8445	6222	No
14	Chillewadi/ Medium	Aug-97	123.63	1	May-10	194.23	0	115.10	207.30	0.00	16	A,B,D	not required	In principal approval obtained.	yes	yes	7455	1070	0	No
15	Tembhu LIS/ Major	Feb-96	1416.59	1	Jan-04	2106.09	3832.98	1417.03	3832.98	0.44	17	A	yes	No	partial	No	111856	4437	1264	No
16	Janai-Shrisai/ Major	Nov-93	56.92	2	Jun-11	411.72	0	279.78	411.72	222.86	20	A,C,E	no	Yes	Yes	No	15488	9809	448	No

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
KIDC																				
17	Bhatsa/ Major	June-67	13.68	5	Oct-07	768.1	1096.51	498.44	768.10	484.76	46	B,C,E	Not required	Yes	No	Not required	42550	13812	1868	No
18	Surya/ Major	January-74	18.91	5	Jan-04	379.26	587.30	437.06	587.30	418.15	39	B,C,E	no	Yes	No	Yes	27188	23107	1805	No
19	Hetawane/ Medium	January-81	15.36	3	Jun-08	329.90		291.15	329.90	275.79	32	A	Not required	Yes	Yes	Yes	11021	2046	124	No
20	Nardave/ Medium	July-89	32.44	3	Jul-07	446.7	649.95	339.03	649.95	306.59	24	A,B,D,E	no	No	No	No	12530.2	1153	6.35	AIBP
21	Korle Satandi/ Medium	October-98	54.59	2	Jan-05	121.76	263.64	114.54	263.64	59.95	15	A,B,E	Not required	Yes	Yes	Not required	3625	0	0	No
22	Kondhane/ Minor	May-11	80.35		-	-	0	0.00	80.35	0.00	2	A,B,C,D.E	no	No	No	Not required	396	0	0	No
23	Shirshadi/ Medium	Oct-85	0.89	3	Jan-12	18.88		13.78	18.88	12.89	28	A,B	Not required	Not required	Not required	Yes	541.2	395	0	No
24	Otav/ Minor	Oct-77	0.29	3	Jan-10	25.02	62.44	31.01	50.20	30.72	36	A,B,D	Yes	Not required	Not required	Not required	855	0	0	No
25	Talere/ Minor	Mar-96	4.68	1	Oct-05	12.44	21.32	13.21	21.32	8.53	17	A.B,D	Not required	Not required	Not required	Not required	437	0	0	No
26	Dendonwadi/ Minor	May-80	1.60	1	Sep-94	12.44	44.21	26.44	42.60	24.84	33	A,B,D,E	Not required	No	No	No	982	0	0	No
27	Virdi/ Minor	Sep-05	43.68		-	-	151.57	44.70	151.57	1.02	8	A,C	Not required	Not required	Not required	Not required	2937	0	0	NABARD
28	Roshani/ Minor	Nov-00	12.34	2	Dec-11	34.98		34.75	34.98	22.41	13	Completed	Not required	Yes	Yes	Not required	690	690	144	No
GMIDC																				
29	Upper Pravara -Nilvande-2/ Major	Apr-70	7.93	3	Dec-03	760.21	2107.12	594.97	2107.12	587.04	43	B,C,D	Not required	Not applicable	Not required	No	64262	1190	0	No
30	Shankar Raoji Chavan Phase-I and Phase II/ Major	May-79	32.24	4	Aug-09	2452.00	2817.51	1834.63	2617.35	1802.39	34	A, B, C, D	Not required	Not required	Not required	Not available	61625	46251	17475	Phase-I in AIBP
31	Upper Manar Project/ Medium	Nov-88	108.65	4	Aug-09	635.96	Not required	358.04	635.96	249.39	25	A, B, C	Not required	Not required	Not required	Yes	12420	6484	1029	AIBP
32	Shiwna takli/ Medium	Jan-79	8.03	3	Mar-09	228.64	Not required	167.40	228.64	159.37	34	C	Not required	Not required	Not required	Yes	6389	4422	2855	AIBP
33	Mula Wambhori Pipe canal & Pump house/ LIS	Jul-99	87.90	5	Oct-11	186.49	Not required	127.80	186.49	39.90	14	A	Not required	Not required	Not required	Yes	3568	2739	1820	No
34	Lower Terna project/ LIS	Feb-90	8.58	3	Sep-08	155.65	Not required	129.72	155.65	121.14	24	-	Not required	Not required	Not required	Yes	8957	8957	599	No
35	Ambit/ Minor	Oct-89	2.10		Feb-08	14.06	Not required	11.91	14.06	9.81	24	Not applicable	Not required	Not required	Not required	Yes	973	973	16	No
36	Titvi/ Minor	May-00	6.18	1	Jun-03	13.13	Not required	10.78	13.13	4.60	13	B	Not required	Yes	Yes	Yes	1554	1554	35	No
37	Ghoti Shilwandi/ Minor	May-04	17.76	Not yet submitted			Not required	15.36	17.76	0.00	9	-	Not required	Yes	Yes	Yes	1801	1801	86	AIBP
38	Khari MI/ Minor	May-92	5.63	2	Mar-05	25.31	33.86	26.77	34.88	21.14	21	B	Not required	Not required	Not required	Yes	1050	779	313	NABARD

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
39	Deolana MI/ Minor	Mar-01	10.61	1st RA submitted to Government			21.50	16.69	21.50	6.08	12	B	Not required	Not required	Not required	Yes	681	230	192	AIBP
40	Sillegaon/ Minor	Mar-02	6.94	2	Jan-05	27.15	35.43	30.84	31.00	23.90	13	-	Not required	Not required	Not required	Yes	905	505	152	NABARD
41	Pimpalwandi (Khopti)/ Minor	Apr-01	6.48	1	Nov-08	12.43	Not required	12.03	12.43	5.55	13	-	Not required	Not required	Not required	Yes	534	534	534	NABARD
42	Kumbhaphal/ Minor	Nov-06	4.99	1st RA submitted to Government			9.17	9.12	9.17	4.13	7	-	Not required	Not required	Not required	Yes	336	330	134	No
43	Musabhadrayan/ Minor	Sep-94	6.10	2		12.62	21.70	19.95	12.62	13.85	19	-	Not required	Not required	Not required	Yes	1130	1130	390	NABARD
44	Hasturtanda MI/ Minor	Jul-00	6.14	1st RA submitted to Government			13.03	15.95	16.01	9.81	13	B	Not required	Not required	Not required	Yes	304	100	10	NABARD
45	Dapegaon/ Minor	Apr-01	7.80	1	Feb-11	19.72	Not required	14.56	23.70	6.76	12	B	Not required	Not required	Not required	Yes	1162	1162	1162	AIBP
46	Borsuri/ Minor	Sep-01	4.17	1st RA submitted to Government			10.68	8.77	19.13	4.60	12	B, D	Not required	Not required	Not required	Yes	487	0	0	No
47	Talni M.I/ Minor	Sep-76	1.47	4	Apr-06	23.86	34.58	24.49	27.51	23.02	37	-	Not required	Not required	Not required	Yes	1200	1200	141	NABARD
48	Renapur sudha/ Minor	Sep-00	11.52	3	Sep-05	21.03	Not required	21.03	21.03	9.51	13	-	Not required	Not required	Not required	Yes	700	700	657	NABARD
49	Waldevi MI/ Minor	Mar-93	13.34	2	Jan-05	55.65	Not required	51.27	55.65	37.93	21	-	Not required	Not required	Not required	Yes	4314	4314	828	AIBP
TIDC																				
50	Waghur Project/ Major	Jan-76	12.28	6	Mar-11	1183.55	Nil	466.30	1183.75	454.02	37	A,C,D,E	Yes	Yes	Yes	Yes	38570	15992	0	AIBP
51	Punad/ Major	May-81	9.15	2	Apr-08	462.17	Nil	267.26	462.17	258.11	32	A,C,D,E	Yes	Yes	Yes	Yes	12662	10519	3047	AIBP
52	Varangaon Parisar Sinchan Yojana/ Major	Jul-99	302.26	5	Jun-99	302.26	Nil	400.35	879.81	98.09	14	A	Yes	Yes	Yes	Yes	27633	0	623	No
53	Khurha Vadhoda Islampur LIS/ Major	Jul-99	207.08	2	May-09	842.40	Nil	435.74	1580.89	228.66	14	A	No	Not required	Not required	Yes	41437	0	0	No
54	Bahula/ Medium	Jan-77	2.66	3	Sep-05	54.97	Nil	45.76	72.80	43.10	36	B,D	No	Not required	Not required	Yes	4654	4654	0	AIBP
55	Prakasha Barrage/ Medium	Jun-94	52.07	3	Feb-09	245.02	Nil	186.10	245.02	134.03	19	-	No	Not required	Not required	Yes	10307	10307	486	AIBP
56	Kamani Tanda/ Medium	Dec-98	42.21	1	Sep-05	78.49	Nil	70.93	78.49	28.72	15	A,B	No	Not required	Not required	Yes	6032	6032	6912	No

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
57	Lower Panzara (Akkalpada)/ Medium	Jan-84	20.68	2	Mar-08	347.31	Nil	308.81	556.28	288.13	29	A,B,C,D,E	No	Yes	No	Yes	7585	3192	0	AIBP
58	Pimpri Dambhurni/ Minor	Aug-94	2.03	1	Apr-05	11.43	Nil	14.08	18.88	12.05	19	-	No	Not required	Not required	Yes	304	304	280	NABARD
59	Matrannalla/ Minor	May-97	3.31	1	Feb-05	11.48	Nil	13.11	21.04	9.80	16	-	No	Yes	No	Yes	512	512	0	NABARD
60	Sur/ Minor	Feb-96	8.18	1	Mar-08	33.28	Nil	30.79	35.63	22.61	18	A	No	Not required	Not required	Yes	830	683	182	AIBP
61	Dhanoli/ Minor	Apr-84	1.22	1	Oct-00	17.62	Nil	16.25	17.62	15.03	30	-	No	Not required	Yes	Yes	1594	1594	0	No
62	Kang/ Minor	Nov-85	2.43	1	Jan-05	26.69	Nil	31.68	77.31	29.25	28	A,B	No	No	No	Yes	1048	0	0	AIBP
VIDC																				
63	Lower Wardha/ Major	1981	48.08	3	Aug-09	2356.58		1228.79	2356.58	1180.71	32	A,B,C,D	No	Not required	Not required	No	66172	17379	0	AIBP
64	Upper Wardha/ Major	1976	13.04	4	Jul-09	1376.64		1148.77	1376.64	1135.73	37	-	Yes	Not required	Not required	Yes	75080	75080	0	AIBP
65	Purna/ Medium	1990	36.45	2	Oct-05	213.10		242.40	227.55	205.95	23	-	Not required	Yes	Yes	Yes	7530	7530	0	AIBP
66	Katepurna Barrage/ Medium	2007	69.97	(original)	Aug-07	69.97		75.02	316.76	5.05	6	A E	No	No	No	No	4137	0	0	No
67	Utawali/ Medium	1991	15.63	3	Jun-08	109.64		114.62	109.64	98.99	22	-	Not required	Yes	Yes	No	5394	5394	0	AIBP
68	Shahapur LargeMinor/ Minor	2009	62.77	(original)	Feb-09	62.77		83.31	145.70	20.54	4	B	No	Yes	Yes	No	1373	0	0	No
69	Dagad Parwa/ Minor	1995	68.97	3	Jun-09	71.86		61.57	71.86	0.00	18	B, E, D	Not required	Yes	Yes	No	1095	661	235	No
70	Raigad/ Minor	2008	38.29	(original)	Feb-08	38.29		38.44	38.29	0.15	5	A,C	No	Not required	Not required	No	1570	0	0	No
71	Chandas Wathoda/ Minor	2007	40.07	1	Dec-10	90.61		77.69	90.61	37.62	6	D,E	No	Yes	Yes	No	1476	180	0	AIBP
72	Lower Dyanganga/ Minor	2009	30.45	(original)	Feb-09	30.45		36.80	96.18	6.35	4	A	No	Not required	Not required	No	1181	0	0	AIBP
73	Dorapgaon/ Minor	1995	5.82	2	Jun-06	18.99		19.99	18.99	14.17	18	Not applicable	No	Yes	Yes	No	847	847	0	No
74	Bewartola/ Minor	1996	8.80	1	Apr-04	27.27		61.50	69.75	52.70	17	A,C,E	Not required	Yes	Yes	No	1742	440	250	No
75	Nimgaon/ Minor	1972	0.23	2	May-08	18.76		14.93	18.76	14.70	41	A,E	Not required	No	No	Yes	1062	0	0	No
76	Chikhali/ Minor	1993	3.85	1	Oct-10	30.30		37.56	40.33	33.71	20	-	Not required	Not required	Not required	No	836	836	0	No
77	Sirsi/ Minor	1983	2.20	1	Mar-09	31.80		27.62	31.80	25.42	30	A,B,C,E	Not required	Not required	Not required	No	1369	1369	0	No
78	Sukali/ Minor	1993	1.02	3	Dec-11	62.73		65.72	69.13	64.70	20	A,B,C,E	No	Not required	Not required	No	1720	1366	0	NABARD
79	Pangrabandi/ Minor	2009	24.50	(original)	Feb-09	24.50		35.49	111.12	10.99	4	B,C,D	No	Not required	Not required	No	1548	0	0	No
80	Januna Sonawala/ Minor	2007	8.49	(original)	Jul-05	8.49		10.16	11.07	1.67	6	Not applicable	No	Not required	Not required	Yes	664	664	182	No
81	Wara Jahangir/ Minor	2009	34.37	(original)	Jan-09	34.37		38.61	99.87	4.24	4	D	No	Not required	Not required		1790	0	0	No

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
82	Antargaon/ Minor	2000	11.78	1	Dec-05	23.38		31.86	39.81	20.08	13	C	Not required	Not required	Not required	No	960	500	0	No
83	Kali Doulatkhan/ Minor	1997	4.05	1	Jan-04	12.07		13.11	16.60	9.06	16	-	Not required	Not required	Not required	No	583	583	160	No
84	Jambnala/ Minor	1994	6.68	2	Jan-10	26.07		31.77	36.64	25.09	19	A,B,D	Not required	yes	Yes	No	1184	1104	0	NABARD
85	Kumbharpind/ Minor	1996	4.28	1	Jan-00	14.27		12.46	14.27	8.18	17	B	Not required	Not required	Not required	Yes	542	542	237	No
86	Purna Barrage No.2 / LIS	2008	180.91	1	Mar-11	638.35		314.06	638.35	133.15	5	B, E	Yes	Not required	Not required	No	6954	0	0	No
87	Sondyatola/ LIS	1995	13.33	2	Aug-09	103.31		110.38	129.73	97.05	18	A,C,E	Not required	Yes	yes	Yes	11010	6105	0	No
Grand Total																	**990289.40**	**436878.00**	**122293.35**	

Reasons for non completion	
A	projects hampered due to paucity of funds
B	projects hampered due to land acquisition problems
C	projects affected due to change in scope of work
D	projects affected due to PAP problems
E	projects affected due to non acqusition of forest land

Completed projects	land not acquired	EC Not obtained	Forest clearance pending

Source: Information furnished by the IDCs

Note : As reported by the Department, survey was carried out for all the projects

Appendix 3.2
(Reference: Paragraph 3.2.1; Page 26)
Statement showing test-checked projects where ECs were not obtained or EC conditions were not fulfilled

	Name of Project / CCA /Date of AA	Audit findings
I	**Projects where ECs were not obtained**	
	KIDC	
1.	Surya/27,188/January 1974	Compliance to GoI's observations raised (November 1993) with regard to EC was made only in September 2002 *i.e.,* after nine years. EC was pending (July 2013).
2.	Nardave /10,105/July 1989	The work on the dam started in February 2001 with CCA of 9,424 ha, which was increased to 12,530 ha as per third RAA accorded in July 2007. The EC required as per EIA notification of 2006 was not obtained.
3.	Virdi /1,508/September 2005	Work order for construction of dam and allied works was issued in April 2007 *i.e.* after EIA notification of September 2006. However, EC was not obtained.
4.	Kondane /240/May 2011	Work commenced (July 2011) without EC.
	MKVDC	
5	Janai Shirsai LIS /19,712/ November 1993	The AA for the project was accorded by GoM in November 1993 and the first RAA accorded in December 2004. The irrigation potential under the scheme was 14,080 ha. The Division Authority submitted (September 2010) a proposal for EC to SEAC since the project covered about 15.88 ha of forest land and the right bank canal of the project also passed through the Mayureshwar Wild Life Sanctuary. EC was pending.
6.	Chaskaman /55,214/December 1973	The scope of the project was increased (July 2003) by increasing the irrigation potential from 29,200 ha to 44,170 ha which required EC from the GoI. Government stated (July 2013) that EC was not necessary as the note indicating the increase in the command area from 29,200 ha to 44,170 ha was approved in July 1993 before the EIA notification of 1994 and accordingly, attached a copy of the note. Reply is not tenable as the said approval was only for incurring expenditure over the AA and there was no mention of the increase in the command area.
	VIDC	
7.	Katepurna Barrage/4,356/31.8.2007	EC awaited.
8.	Lower Dhyanganga/1,476/12.2.2009	Proposal submitted on 25.2.2013; clearance awaited.
9.	Januna/664/8.7.2007	Proposal yet to be submitted.
10.	Pangrabandi/1,548/27.2.09	Proposal yet to be submitted.
11.	Warajahangir/1,790/30.1.09	Proposal yet to be submitted.
12.	Sukli/523/18.7.07	Proposal submitted for EC in July 2008. EC was awaited.
13.	Lower Wardha/78,873/9.1.1981	As per the third RAA (August 2006) the irrigation potential of the project was increased by 12,407 ha. However, extension work was started without EC as per EIA notification of September 2006.
	TIDC	
14	Kurha Vadhoda LIS/25,898/ 6.7.1999	EIA study report forwarded to MoEF in April 2011. EC under process.
	GMIDC	
15.	Shankararaoji Chavan Vishunupuri Project, Phase II/26,523/May 1979	Proposal for EC for RAA was under process.

Appendix 3.2 (concld.)		
Name of Project / CCA /Date of AA		**Audit findings**
II	**Non fulfillment of EC conditions**	
1.	Tarali Irrigation Project/18,131/February 1996 (MKVDC)	The project received EC in July 2004. As per specific condition, Catchment Area Treatment (CAT) Plan consisting of biological measures[169] and engineering measures [170]was to be completed in three years. However, the plan was yet to be implemented for want of funds (March 2013).
2.	Urmudi Irrigation Project/37,000/ October 1993 (MKVDC)	The project received EC in February 2005. As per specific condition of the EC, CAT Plan was to be completed in three years. However, the CAT Plan was not implemented. Further, the rehabilitation of PAPs as required under special condition of the EC was not completed as of March 2012.
3.	Tembu LIS/1,49,631/ February 1996 (MKVDC)	The EC was obtained in August 2007 which stipulated that a multi-disciplinary Committee in consultation with the MoEF should be constituted with ecologists, environmental Scientists and experience administrators to oversee the effective implementation of the suggested safeguard measures like compensatory afforestation programme. Government stated (July 2013) that the multi-disciplinary Committee was formed in June 2008 but details of actual safeguard measures suggested and the minutes of meetings of the Committee called for in audit were awaited (November 2013).
4.	Waghur/26,325/6.1.1976 (TIDC)	EC received in October 2006. Compliance of conditions of EC was in progress.
5.	Punad/12,662/29.5.1981 (TIDC)	EC received in December 1993. Compliance of conditions was in progress.
6.	Upper Wardha/83,300/13.2.1965 (VIDC)	Sixteen out of 17 conditions have been complied with.

[169] Biological measures include repairs of farm bunds, terrace bund improvement, planting in farm bund, reforestation and afforestation

[170] Engineering measures include gully plugging, loose boulder shoulder, gabian bandhara and cement nulla bund

Appendix 3.3
(Reference: Paragraph 3.2.2; Page 28)
Statement showing increase in cost due to delay in payment of afforestation charges

Name of the IDC	Audit Findings
KIDC	Forest Department intimated (July 2009) WRD to pay ₹ 76.04 crore for transfer of forest land (681.589 ha) required for Mumari dam and Bhatsa left bank canal and right bank canal. The charges were however, paid after three years in July 2012. In the meanwhile, the Forest Department intimated (June 2013) the revised NPV and allied charges of ₹ 104.94 crore. The delay in payment thus, resulted in increase in cost of acquisition of forest land by ₹ 28.90 crore.
	Forest Department granted (2001) in-principle approval for acquisition of forest land of 33.0513 ha for construction of canals for Hetawne medium irrigation project. The Deputy Conservator of Forests, (DCF) Alibag demanded (April and November 2001) an amount of ₹ 51.93 lakh (₹ 22.94 lakh for compensatory afforestation, survey, demarcation and ₹ 28.99 lakh towards plantation on the both sides of canal, tree cutting, drip irrigation). The WRD however, paid the entire amount of ₹ 51.93 lakh only by March 2004. In the meanwhile, GoI issued order for recovery of NPV in all the forest clearance cases in which final approval was accorded after 29 October 2002. Accordingly, the DCF demanded (May 2010) an additional amount of ₹ 3.10 crore as NPV which was not paid even as of July 2013. Thus, delay of three years in payment of ₹ 51.93 lakh for obtaining final approval resulted in increased levy of NPV of ₹ 3.10 crore.

Appendix 3.4

(Reference: Paragraph 3.2.4; Page 31)

Statement showing increase in project cost due to improper survey

(in ₹ crore)

Sr No	Name of the project	Name of the work	Date of work order	Due date of completion as per work order	Reasons for increase in cost	Nature of change	Increase in cost
1	2	3	4	5	6	7	8
				MKVDC			
1	**Kudali project**	Construction of new canal and distributaries	May 1997	May 2000	Change in design	Construction of new canal and distributaries in place of KT weirs.	46.66
2	**Kalgaon project**	Dam work-	April 2000	October 2001	Change in design	Construction of Tail channel and Head regulator.	5.43
3	**Niwakane project**	Dam work-	June 2000	May 2002	Change in design	Construction of Tail channel, Head regulator and Spill way.	7.58
5	**Urmodi project**	Dam work-	December 1997	December 2000	Design change	Increase in dam height.	39.46
6	**Urmodi**	RBC	June 2000	June 2003	Improper survey	RBC was covered under Ambale Minor Project Command Area necessitating change in alignment of RBC.	10.02
7	**Uttarmand project**	Dam work	June 1997	May 2000	Improper survey	shifting of masonry dam (earthen dam), additional provision of spillways after issue of work order.	16.63
8	**Pimpalgaon Dhale**	Dam work	March 1997	March 2000	Improper survey	Change in structural design and increase in quantity of embankment.	28.68
9	**Pimpalgaon Dhale**	Road	Dec 2009	October 2011	Improper survey	Raising height of existing road after issue of work order.	1.49
10	**Dudhganga**	LBC (Tunnel)	March 2001	March 2005	Improper survey	Site found unsuitable for tunnel due to hard rock and canal work was undertaken instead of tunnel work.	2.72
						Total (A)	**158.67**

Appendix 3.4 (concld.)							
1	2	3	4	5	6	7	8
KIDC							
11	**Bhatsa Project**	Birwadi LIS	May 2007	May 2010	Change in design	After issuing the work order, the location of pump house was changed on the basis of Central Design Organisation, Nashik directives.	10.51
12	**Dendonwadi Minor Project**	Dam work	January 1998	June 2001	Improper survey	As against the envisaged water storage of 10.16 mcum, water storage of 1.37 mcum could be achieved as the State Highway was falling under the submergence area.	26.44
VIDC							
13	**Antargaon Minor Project**	Dam work	February 2006	February 2010	Improper survey	Dam site shifted downstream as the envisaged storage was not possible.	14.17
						Total (B)	**51.12**
Grand Total (A+B)							**209.79**
Other issues (KIDC)							
14	**Korle-Satandi**	Dam work	January 2002	January 2006	Improper survey	Dam site was shifted upstream to acquire forest land of one ha instead of initially planned 4.36 ha, decrease in dam height *etc.*	
15	**Virdi Minor Project**	Dam work	April 2007	April 2011	Improper survey	Subsequent change of site, height of dam of *etc.* due to the demands of stakeholders.	

Appendix 3.5
(Reference: Paragraph 3.2.8; Page 42)
Inadequacies in preparation of estimates

(in ₹ crore)

Name of IDC and name of the project	Name of work (name of the agency)	Inadequacies in preparation of estimates	Amount involved
MKVDC (Tarli major irrigation project)	Construction of Koparde Approach Canal Km 0 to 32 (Prasad & Co)	Labour Welfare Cess[171] (LWC) of one *percent* was included and technical sanction was accorded (April 2012) by CE, Special Project, WRD for additional and extra works though the original agreement was finalised before 1 July 2010. Government accepted (July 2013) the observation and stated that the amount would be deducted from the contractor's bills.	2.24
KIDC (Korle-Satandi medium irrigation project)	Construction of dam (M/s Noble India, Jaipur)	Cofferdam[172] is required to be constructed during gorge filling. However, since the cofferdam was not included in the original estimates, the same was awarded (October 2009) to the contractor as an extra item for ₹ 73.83 lakh resulting in extra expenditure due to higher EIRL compared to the rates at the time of calling (October-November 2001) of tender. Government stated (July 2013) that in the original project report gorge filling was to be done in two stages but as per the site condition and as suggested by CDO, Nashik the gorge filling was required to be completed in one season. The reply indicates inadequacies in preparation of estimates.	0.74
GMIDC	17[173] Barrage works	Estimates of major/medium projects involving manufacture and erection of gates of barrages revealed that the item rates were framed by the project authorities including Central Excise duty[174] (CED) and Service Tax[175] though they were exempt. Further, WRD neither ensured payment of these duties and taxes to the Central Excise Department nor recovered the same from the contractors. Government stated (July 2013) that while framing the estimates it was presumed that the components would be manufactured/fabricated at workshop rather than at work site. But the contractors decided to establish workshop at site only. It further stated that cost of establishing workshop at sites requires capital expenditure and recurring expenditure which was not included in the estimates. The reply is not acceptable as the contractors had carried out fabrication works at the dam site and were entitled to CED exemption. Therefore, loading of CED in the estimates was incorrect. Further, GMIDC had already factored in the workshop charges in addition to overhead charges at 10 *per cent*. No comments were offered on service tax exemption.	30.22
			33.20

[171] As per the GR (17 June 2010), Labour Welfare Cess at one *per cent* of the cost of work should be recovered from those contractors whose agreements were finalised on and after 1 July 2010

[172] A temporary enclosure built within a water body for creating a dry work area

[173] Tarugavan, Dhalegaon, Mudgal, Muli, Sai, Shivani, Lasra, Somanthali, Ghatne, Babhli, Balegaon, Amdura, Digras, Mangrul, Apegaon, Hiradpuri and Waki

[174] Structures and parts of structures of iron and steel fabricated at site of work for use in construction are exempt from payment of duty vide Notification dated 24 February 2005 as amended

[175] Service tax is exempt from construction services of dam as it is excluded from the definition of construction services as per Section 65 (25b) of the Finance Act, 1994

Appendix 3.6
(Reference: Paragraph 3.3.1; Page 47)
Contracts awarded without inviting tenders

Sr. No.	Name of project	Name of the contractor	Nature of original work	Type of work awarded without inviting tender	Amount in (₹ crore)	Government reply (July 2013)
1.	2.	3.	4.	5.	6.	7.
MKVDC						
1	Dhamini Medium Irrigation Project	M/s Shri D.Y. Uppar, and M/s G.Shankar & Anand SM	Dam work	Horizontal Sand Mat[176] (March 2009)	48.81	The work of horizontal sand mat and casing work was to be carried out simultaneously hence, awarded to the same contractor. Reply is not acceptable as in that case the item of work should have been included in the original estimates.
2	Tarli - Major Irrigation Project	M/s Prasad & Co ltd, SEW Construction ltd, Hyderabad (Joint Venture)	Dam work	Ring Road (December 2006)	10.71	The existing contractor was ready to execute the work with his own resources hence, to avoid further claims due to stoppage of work, the work was awarded to the same contractor. The reply is not tenable as the type of work awarded was different from the tendered work and could have been awarded after due process of tendering to obtain competitive rates.
3		M/s Prasad & Co (P.W) Ltd	Dam work	Tunnel Work (March 2012)	125.69	This was a technical change and no other work outside the scope of the original work was awarded to the contractor. The reply is not acceptable as the tunnel work was a specialised nature of work and separate bidding was necessary to obtain competitive rates.

[176] The sand mat is in the form of band of 20 meter in width and 60 m on upstream side on each berm and laid continuously on alternate berms on downstream side

Appendix 3.6 (continued)						
1	**2**	**3**	**4**	**5**	**6**	**7**
4	Urmodi - Major Irrigation Project	M/s Mulay Brothers Pvt Ltd, Amit constructions (Joint Venture)	Dam work	Irrigation Cum Power Outlet (ICPO) (June 2008)	2.30	The work of ICPO was initially stopped (2000) due to paucity of funds, restarted in 2005 and finally terminated in 2007. The balance work was attached to the contractor executing dam work as the project was included in a time-bound programme. The reply is not acceptable as the work of ICPO should have been tendered separately and then executed.
5		Shri R.B Ghordke	Canal (Ch. 0/0 to 07/00) of Urmodi RBC	Canal Km. Ch. 8/00 to 16/100 of Urmodi RBC	5.81	The attachment of the said work was preferable since the tender was based on old DSR and also due to reduction in the original scope of tender. Reply is not tenable as the canal work was to be executed in a different stretch and accordingly bids should have been invited.
		Total (A)			**193.32**	
GMIDC						
1	Nandur Madhameshwar	M/s Harwins constructions	Earth work, spill-way, guide wall, head regular on Waki river	Rehabilitation works in Korpagaon New Gaothan	1.47	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
2	-- do --	M/s Muley Bros	Construction of Bhawali Dam	Construction of gutter along road rehabititated village Bhawali & Manveda	0.84	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
3	Ugilewadi Storage Tank	M/s Pooja Constructions.	Dam work i.e. head works of the storage tank	Bringing casing material for dam from borrow area (0.5 km) ₹ 8.95 lakh and change in grade of concrete from Uncoarsed Rubble to Cement Concrete M-15 ₹ 12.15 lakh.	0.21	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.

Appendix 3.6 (continued)						
1	**2**	**3**	**4**	**5**	**6**	**7**
4	Shivali Storage Tank	M/s Adi Constructions. Osmanabad	Dam work i.e. head works of the storage tank	Construction of alternative road under Shivali and road	0.24	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
5	Molwan Storage Tank	M/s Krithi Constructions.	Dam work i.e. head works of the storage tank	Construction of approach road	0.41	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
6	Manjra Project	M/s Shraddha & Mahalaxmi (Joint Venture)	Dongargaon Barriage	Submergence bridge	3.99	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
7	Manjra Project	M/s Garje Steel Industries Latur	Borgaon-Anjanpur Barriage	Construction of service bridge necessary for M & R of the barrage gates	0.33	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
8	Manjra Project	M/s Garje Steel Industries Latur	Borgaon-Anjanpur Barriage	Approach road	0.15	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
9	Ravankola Storage Tank	M/s S.D. Constructions.	Dam work i.e. head works of the storage tank	Submergence road	1.25	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
10	Deepgaon Storage Tank	M/s Nita Constructions	Deepegaon KTW	Construction of road under submergence	0.25	Additional works were executed to save time required in tender process. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.

Appendix 3.6 (continued)

1	2	3	4	5		7
11	Upper Pravara Project	M/s New Asian Constructions	Construction of Masonary dam up to a height of 610 m alongwith irrigation & Power outlet of Nilwande-II	Originally only truncated section of masonry dam (up to 610 m height of dam) for ₹ 35.63 crore was given, later on the Department attached the work of height raising and widening of dam from 610 m to 613m at a cost of ₹ 58.45 crore in May 2000 and further attached the work of height raising up to 652m in December 2003 for ₹ 63.94 crore.	122.39	Due to opposition from PAPs and fund constraints, only truncated section of dam (up to 610 m) was allotted to contractor initially in 1995 and subsequently additional work was allotted. Reply is not tenable as opposition by PAPs and shortage of funds cannot be a reason for partial allotment of work initially and subsequently awarding the full work without tendering.
12	Bhabhali Project	Soma Enterprise Ltd.	Construction of Babhali High Level barrage	Original civil works for ₹ 39.29 crore for barrage was allotted in August 2004 and mechanical works costing ₹ 65.06 crore was allotted in April 2006.	65.06	The mechanical works were inseparable from civil works. Reply is not acceptable as in another project at Vishnupuri, mechanical works of 12 barrages were awarded independently through open tender.
				Total (B)	**196.59**	
				KIDC		
1	Shirsadi Minor Irrigation Project	Chowgule construction Company	construction of dam	Construction of canals	2.50	The Executive Director of KIDC was competent to award the canal work to the same contractor as additional work. The reply is not acceptable as awarding of work without inviting tender violated the provisions of MPW manual .
2	Korle-Satandi Medium Irrigation Project	Noble India Construction Co. Jaipur	Construction of dams	Construction of approach road	0.38	There was a saving of ₹ 1.28 lakh as a result of executing of the work through sanctioned tender. The reply is not acceptable as the department should have resorted to tendering to obtain competitive rates, as the work was of different nature.

Appendix 3.6 (concld.)

1	2	3	4	5	6	7
3	Nardave Medium Irrigation Project	M/s R. N. Naik and Sons	Construction of dam	Rehabilitation work of levelling of land and providing civic amenities	22.45	Rehabilitation works of different villages were allotted to three different contractors. However, remaining rehabilitation works were entrusted to the prime contractor of dam in order to keep progress of both the works. It was also stated that 80 *per cent* of the rehabilitation work was completed till May 2012 and it was proposed to complete the work and shift the PAPs by December 2013. Reply is not tenable as in that case the Government should have tendered the remaining work to obtain competitive rates.
				Total (C)	**25.33**	
TIDC						
1	Dhule Medium Project Division	M/s Rana Projects International Ltd	Construction of earthen dam, Akkalpada	Construction of civil amenities at rehabilitation site	4.26	Additional works were allotted without tendering to save time and cost. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
2	Waghur Dam Division, Jalgaon	M/s A Prabhakar Reddy	Construction of slab culvert	Survey of command area	1.79	Additional works were allotted without tendering to save time and cost. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
3	Waghur Dam Division, Jalgaon	M/s A Prabhakar Reddy	Constructing of earthen dam	Survey of structure	2.30	Additional works were allotted without tendering to save time and cost. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
4	Minor Irrigation Division, Jalgaon	M/s Anup singh and sons	Constructing of MI Tank, Sur	Construction of diversion of road	0.97	Additional works were allotted without tendering to save time and cost. Reply is not acceptable as the additional works were incidental to the original works hence, they could have been included in the original estimates.
				Total (D)	**9.32**	
Grand Total (A+B+C+D)					**424.56**	

Appendix 3.7

(Reference: Paragraph 3.3.4; Page 51)

Non-recovery/Short-recovery of royalty charges

Name of IDC	Name of project	Nature of work (Name of agency)	Audit findings in brief	Government reply (July 2013) and audit remarks	Short-recovery (₹ in crore)
1	2	3	4	5	6
MKVDC	Urmodi	Work of Construction of earthen dam with gated spill way across the river Urmodi {(M/s Mulay Brothers Pvt. Ltd. & M/s Amit Construction (Joint Venture)}	Payment for construction of embankment for hearting zone and casing zone[177] involving use of excavated material (54.08 lakh cum) was paid up to June 2012. However, royalty charges amounting to ₹ 3.06 crore was not recovered from the contractor's bills despite non-production of challan towards payment of royalty charges by the contractor.	Royalty charges were included in the estimates and contractors would have quoted higher rates if the royalty charges were not included in the estimates. The reply is not acceptable as royalty charges were already included in the estimates and was recoverable on non-production of challans by contractors.	3.06
	Kitwad – 2	Construction of MI Tank (M/s Bhaskar Reddy)	The contract price was inclusive of royalty charges. However, despite non-production of challan royalty charges amounting to ₹ 1.06 crore was not recovered.	The royalty charges would be recovered from the payment of extra items to the contractor.	1.06

[177] A zone of impervious earth within a zoned earthen or rockfill dam while casing zone is the outer side of hearting zone placed with pervious soils so as to protect the hearting zone

Appendix 3.7 (concld.)

1	2	3	4	5	6
	Uttarmand	Construction of Dam (M/s L V Kunjir)	The contract price was inclusive of royalty charges. However, apart from the payment of contract price inclusive of royalty charges, additional payment of ₹ 72.38 lakh was made on the basis of challan produced resulting in double payment of royalty charges.	There was no provision in the tender for recovery of royalty charges. Extra item was sanctioned for payment of royalty charges to the contractors. Reply is not acceptable as it was clarified to the contractors in the pre-bid meeting (January 1997) that contractors were to bear the royalty charges and thus, the rate was inclusive of royalty charges. Therefore, an additional payment of ₹ 72.38 lakh resulted in double payment.	0.72
	Pimpalgaon Dhale	Canal work (M/s Shelke Construction)	Royalty charges not recovered despite non-production of proof of payment of royalty charges by the contractor.	Recovery would be made from the contractors' bills.	0.14
		Canal work (M/s Bhagyashree Construction)	Royalty charges not recovered despite non-production of proof of payment of royalty charges by the contractor.		0.28
VIDC	Pangra Bandi	Construction of earthen dam, waste weir and head regulator (M/s Sanjay Kalbhor and Associates)	Recovery of ₹ 54.77 lakh in the fifth running account bill was approved and recorded in measurement book on account of non-production of challan by the contactor in support of payment of royalty charges. However, the bill was paid without recovering the amount, resulting in undue benefit of ₹ 54.77 lakh to the contractor. EE replied (May 2012) that the contractor requested not to recover the royalty charges.	As the contractor was obtaining royalty passes to avoid double payment to the Revenue Authority, his request was accepted in V RA bill. It was stated that the total royalty charges to be recovered up to 7th RA bill (August 2012) was ₹ 97.74 lakh of which ₹ 51.49 lakh was recovered and balance of ₹ 46.25 lakh proposed to be recovered in the 8th RA bill. The reply clearly indicates that financial accommodation was continued to be granted to the contractor by not recovering the royalty charges in time.	0.46
					5.72

Appendix 3.8
(Reference: Paragraph: 3.4.2; Page 56)
Data inconsistencies in Irrigation Status Reports

a) Discrepancies in number of irrigation projects as per ISR of WRD and Regional ISRs

Year	ISR (as per WRD)	RISR Compilation	Understated (-) in ISR
2007-08	3076	3330	(-) 254
2008-09	3254	3495	(-) 241
2009-10	3575	3576	(-) 1
2010-11	3575	3702	(-)127

b) Discrepancies in the number of irrigation projects in ISR and RISR

(Number of irrigation projects)

Year	ISR (as per WRD)	RISR Compilation by Audit	Over-statement (+)/ Understatement (-) in ISR
2007-08	3076	(-) 2224	(+) 852
2008-09	3254	(+) 2690	(+) 564
2009-10	3575	(+) 2723	(+) 852
2010-11	3575	(+) 3030	(+) 545

c) Discrepancies in projected IP to be created and IP utilised as per ISR and RISR

(IP in '000' hectares)

Year	IP to be created from all the projects (completed and that in progress)			Utilized IP		
	ISR (as per WRD)	RISR Compilation by WRD	Over-statement (+)/ Under-statement (-) in ISR	ISR (as per WRD)	RISR Compilation by WRD	Over-statement (+)/ Understatement (-) in ISR
2007-08	5484.03	5484.03	0	2764.68	2766.28	(-) 1.6
2008-09	6165.28	6165.28	0	2731.64	2732.13	(-) 0.49
2009-10	6640.74	6689.86	(-) 49.12	2542.39	2542.37	(+) 0.02
2010-11	7238.75	7238.75	0	2954.68	2954.78	(-) 0.1

d) Discrepancies in designed storage and live storage as on 15th October each year

(Volume of water in mm^3)

Year	Designed storage			Actual water storage as on 15th October		
	ISR (as per WRD)	RISR Compilation by Audit	Over-statement (+)/ Under-statement (-) in ISR	ISR (as per WRD)	RISR Compilation by Audit	Over-statement (+)/ Under-statement (-) in ISR
2007-08	29115.71	31108.814	(-) 1993.104	25489.18	26941.481	(-) 1452.3
2008-09	33070.45	32150.34	(+) 920.11	24802.74	24441.01	(+) 361.73
2009-10	33211.1	32870.82	(+) 340.28	19365.78	19189.60	(+) 176.18
2010-11	33385.49	32999.85	(+) 385.64	27309.26	27582.11	(-) 272.85

Appendix 3.8 (concld.)

e) Discrepancies in use of water for irrigation purpose

(Volume of water in mm^3)

Year	Irrigation use		
	ISR (as per WRD)	RISR Compilation by Audit	Over-statement (+)/ Under-statement (-) in ISR
2007-08	16412.75	16643.55	(-) 230.80
2008-09	15517.18	15975.77	(-) 458.59
2009-10	12113.64	13096.69	(-) 983.05
2010-11	15446.60	15409.38	(+) 37.22

f) Discrepancies in use of water for non-irrigation purpose

(Volume of water in mm^3)

Year	Drinking water use			Industrial and other use		
	ISR (as per WRD)	Audit Compilation from RISR	Over-statement (+)/ Under-statement (-) in ISR	ISR (as per WRD)	Audit Compilation from RISR	Over-statement (+)/ Under-statement (-) in ISR
2007-08	2801.80	2989.829	(-) 188.029	2738.84	2768.074	(-) 29.234
2008-09	3444.72	3447.79	(-) 3.07	2330.75	2252.80	(+) 77.95
2009-10	3151.41	3461.44	(-) 310.03	1611.78	1707.97	(-) 96.19
2010-11	3260.22	3374.26	(-) 114.04	2616.04	2565.83	(+) 50.21

g) Discrepancies in number of projects against which IP created and utilised as per ISR and Economic Survey Report:

Year	Number of projects		
	ISR (as per WRD)	Economic Survey Report	Over-Statement (+)/ Understatement (-) in ISR
2007-08	3076	3090	(-) 14
2008-09	3254	3251	(+) 3
2009-10	3575	3332	(+) 243
2010-11	3575	3452	(+) 123

h) Maximum live storage shown more than the designed live storage in Water Audit Reports

Analysis of data based on which Water Audit Report is prepared revealed that in 28 records involving 19 projects, during 2007-12, the maximum live storage (water actually available for use) shown in Water Audit report was more than the designed live storage of the project. The percentage of excess live storage ranged between 101 and 364.

i) Incorrect balance of water in Water Audit Reports

On the basis of inflow and outflow, the balance quantum of water was derived and compared with the actual balance shown in the database for the period from 2006-10. Audit observed that out of 1,147 records:

i) In only 583 records, the balance quantum of water as of 30 June matched with the database figures;

ii) In 306 records, the balance as of 30 June was shown less than the quantum worked out by audit, as per the database obtained from Maharashtra Water Research and Development Centre; and

iii) In 214 records, the total outflow of water was more than the total inflow of water. In the remaining 44 records the total outflow was less than total inflow.

Appendix 4.1
(Reference: Paragraph 4.2.2; Page 62)
Statement showing Category II deficiencies in dams

Sr. No.	Name of dam	Deficiencies	Remedial measures suggested
1	Paithan dam (Jayakwadi Project)	Longitudinal cracks were observed at Chainage 216 to 217, 228 to 230, 237 to 248	Longitudinal cracks should be excavated up to hearting and filled with murum and sand.
2	Manjara dam	All the drains including drains on both the flanks were not functioning and cross drains and toe drains were deshaped.	Drainage arrangement to be kept effective by periodical cleaning and disturbed pitching of drains to be reset and drains desilted. It was also suggested to clear outfall for drains to avoid pools or stagnant water in the drains and at the toe of the dam and in the river portion.
3	Majalgaon dam.	Leakage was observed in hydropower generation house and scouring observed near the guide wall.	Proper treatment of scouring in rich cement concrete and necessary repairs were suggested.
4	Isapur dam	Out of 18 Piezometers (to measure the total pore pressure), only four were working.	It was suggested to get the Piezometers repaired in consultation with Maharastra Engineering Research Institute (MERI).
5	Siddheswar dam	The crest profile and downstream side bottom width reduced.	Any local damages to masonry on water side face was to be repaired with masonry/concrete filling depending upon the extent of damage.
6	Sina Kolegaon dam	Heavy seepage in gallery and gallery being full of water.	It was suggested to dewater the gallery and find out reasons for seepages and carry out repairs by providing proper treatment.

Appendix 5.1

(Reference: Paragraphs 3.1 and 5.2.1; Pages 25, 71 and 72)

The position of IP projected to be created, IP created and IP utilised in respect of total projects handed over by GoM and new projects taken up by IDCs

(in thousand ha)

Region	Name of IDC	Total IP projected to be created out of total projects handed over and new projects taken up (June 2013)				IP created (June 2013)				IP utilised As on June 2012			
		A	B	C	Total	A	B	C	Total	A	B	C	Total
Vidarbha	VIDC	1127.41	262.55	189.33	1579.29	291.04	122.67	73.46	487.17	80.62	21.83	16.59	119.04
Marathwada	GMIDC	851.55	114.55	190.86	1156.96	547.12	73.83	145.89	766.84	0.00	0.00	0.00	0.00
Rest of Maharashtra	MKVDC	1681.94	291.94	546.50	2520.38	990.54	240.52	512.41	1743.47	1073.44	132.60	327.69	1533.74
	KIDC	108.32	84.04	63.11	255.46	44.27	8.67	22.23	75.17	3.83	0.23	2.21	6.27
	TIDC	342.40	142.40	68.20	553.00	29.00	83.00	59.00	171.00	4.00	28.00	13.00	45.00
	Total	**4111.62**	**895.48**	**1058.00**	**6065.09**	**1901.97**	**528.69**	**812.99**	**3243.65**	**1161.89**	**182.66**	**359.49**	**1704.05**

Source: Information furnished by the IDCs

Note 1: A: Major projects**; B:** Medium project and **C:** Minor projects

Note 2: Figures of IP utilised has not been compiled by the IDCs

Note 3: Two districts of GMIDC *i.e.* Ahmednagar and Nashik are in Rest of Maharashtra

Appendix 5.2
(Reference: Paragraph: 5.2.1; Pages 71 and 72)
IP projected to be created, IP created and IP utilized

(Area in lakh ha)

Year	Projected IP to be created	Created IP	IP utilized through canals including rivers	IP utilized through wells	Total IP utilized (Col 4+5)	Percentage of total IP utilization to IP created (Col 6/3 x 100)	Percentage of IP utilization through canals including rivers to total IP utilized (Col 4/6 x 100)	Percentage of IP utilization through wells to total IP utilized (Col 5/6 x 100)
1	2	3	4	5	6	7	8	9
2000-01	42.71	37.06	12.98	4.66	17.64	47.60	73.58	26.42
2001-02	43.17	37.69	12.5	4.58	17.08	45.32	73.19	26.81
2002-03	43.64	38.12	13.18	5.24	18.42	48.32	71.55	28.45
2003-04	44.16	38.63	12.44	4.41	16.85	43.62	73.83	26.17
2004-05	44.58	39.13	12.59	4.4	16.99	43.42	74.10	25.90
2005-06	45.23	40.03	16.17	5.97	22.14	55.31	73.04	26.96
2006-07	49.75	41.32	18.35	8.47	26.82	64.91	68.42	31.58
2007-08	63.44	43.31	18.97	8.68	27.65	63.84	68.61	31.39
2008-09	64.36	44.86	18.24	9.07	27.31	60.88	66.79	33.21
2009-10	64.78	46.34	16.56	8.87	25.43	54.88	65.12	34.88
2010-11	65.29	47.37	18.41	11.14	29.55	62.38	62.30	37.70
2011-12	66.14	48.26	20.43	12.08	32.51	67.36	62.84	37.16
Percentage increase in 2011-12 compared to 2000-01		30.22	57.40	159.23	84.30			

Source: Figures for 2000-01 to 2010-11 from Irrigation Status Reports of WRD and figures for 2011-12 consolidated from latest available ISR of the six regions in the State

Appendix 5.3
(Reference : Paragraph 5.2.3; Page 75)
Statement showing evaporation loss of more than 200 *per cent* with reference to live storage of water as on15 October

Sl. No.	Project	Project type	District	Year		Live storage (in mcum)	Evaporation (in mcum)	Percentage of evaporation to live storage
				From	To			
1	Tiru	Medium	Latur	2007	2008	3.180	7.143	224.62
2	Bagheda	Medium	Bhandara	2008	2009	0.130	0.909	699.23
3	Chandai	Medium	Chandrapur	2008	2009	1.120	4.509	402.59
4	Chandpur	Medium	Bhandara	2008	2009	0.096	1.456	1516.67
5	Dina	Major	Gadchiroli	2008	2009	3.040	6.416	211.05
6	Koradi	Medium	Buldhana	2008	2009	1.900	4.391	231.11
7	Sorna	Medium	Bhandara	2008	2009	0.003	0.302	10066.67
8	Adan	Medium	Washim	2009	2010	2.520	7.098	281.67
9	Naleshwar	Medium	Chandrapur	2009	2010	1.080	2.799	259.17
10	Kukadi Complex	Major	Pune	2009	2010	19.920	47.165	236.77
	Kukadi Complex	Major	Pune	2010	2011	10.710	32.905	307.24
11	Bhokarbari	Medium	Jalgaon	2009	2010	0.284	0.979	344.58
12	Masoli	Medium	Parbhani	2009	2010	0.415	2.631	633.98
13	Nagya Sakya	Medium	Nashik	2009	2010	1.270	2.900	228.35
14	Tawarja	Medium	Latur	2009	2010	1.382	5.664	409.84
15	Turori	Medium	Osmanabad	2009	2010	0.093	0.608	653.76
16	Upper Dudhana	Medium	Jalna	2009	2010	0.844	1.704	201.90
17	Khadakpurna	Major	Buldhana	2010	2011	13.645	27.512	201.63
	Source : Analysis done by Audit on the database maintained by MWRDC, Aurangabad							

Appendix 5.4
(Reference : Paragraph 5.2.7; Pages 86 and 87)
Irrigation system performance in Bhatsa RBC, Ujjani LBC & RBC and Neera RBC

Year and Name of Project / Canal	Irrigation system performance during Rabi	Irrigation system performance during hot weather
Standard fixed by GoM	**150 ha/mcum**	**110 ha/mcum**
2007-08		
Ujjani Left Bank Canal	52.21	41.78
Ujjani Right Bank Canal	54.70	54.53
Bhatsa Right Bank Canal	38.55	Cropping not planned during summer
Neera Right Bank Canal	123.13	108.19
2008-09		
Ujjani Left Bank Canal	83.62	50.44
Ujjani Right Bank Canal	82.44	40.28
Bhatsa Right Bank Canal	43.30	Cropping not planned during summer
Neera Right Bank Canal	129.83	104.16
2009-10		
Ujjani Left Bank Canal	101.84	65.32
Ujjani Right Bank Canal	77.85	39.90
Bhatsa Right Bank Canal	39.04	Cropping not planned during summer
Neera Right Bank Canal	140.35	91.87
2010-11		
Ujjani Left Bank Canal	97.83	67.23
Ujjani Right Bank Canal	51.82	44.22
Bhatsa Right Bank Canal	31.75	Cropping not planned during summer
Neera Right Bank Canal	109.94	102.60
2011-12		
Ujjani Left Bank Canal	84.17	82.86
Ujjani Right Bank Canal	48.56	43.81
Bhatsa Right Bank Canal	24.65	Cropping not planned during summer
Neera Right Bank Canal	117.11	113.59
Source : Water account of the projects		

Appendix 5.5

(Reference: Paragraph 5.2.7.1; Page: 87)

Canal efficiency of major projects in the six regions of the State

(in mcum)

Region	Year	No. of major Projects	Water in Left Bank Canal				Water in Right Bank Canal				Total water in Left Bank Canal			Total water in Right Bank Canal			Total water drawn at head	Total water released in canal	Efficiency Of canal (percentage)
			Rabi		Hot Weather		Rabi		Hot Weather										
			Drawn at head	Released in canal	Drawn at head	Released in canal	Drawn at head	Released in canal	Drawn at head	released in canal	Drawn at head	Released in canal	Canal Efficiency	Drawn at head	Released in canal	Canal Efficiency			
Amravati	2007	3	19.40	112.19	0.00	22.28	8.30	230.02	9.67	65.96	19.40	134.47	14.43	17.97	295.98	6.07	37.37	430.45	8.68
	2008	1	20.42	27.91	0.00	6.07	10.28	14.30	0.00	3.31	20.42	33.98	60.08	10.28	17.61	58.38	30.70	51.59	59.50
	2009	1	0.00	43.49	0.00	8.66	0.00	185.86	0.00	20.65	0.00	52.16	0.00	0.00	206.51	0.00	0.00	258.67	0.00
	2010	3	42.28	82.79	18.68	54.00	86.59	168.86	15.71	75.95	60.96	136.78	44.57	102.30	244.81	41.79	163.26	381.59	42.78
Average													29.77			26.56			
Aurangabad	2007	5	573.83	721.60	322.30	441.11	261.73	364.09	217.02	301.04	896.13	1162.70	77.07	478.75	665.14	71.98	1374.89	1827.84	75.22
	2008	4	537.54	610.03	504.68	667.07	254.15	349.79	189.46	296.74	1042.22	1277.11	81.61	443.61	646.53	68.61	1485.83	1923.63	77.24
	2009	2	35.88	45.56	15.45	45.24	11.00	30.67	0.52	45.98	51.33	90.80	56.53	11.52	76.65	15.03	62.85	167.45	37.53
	2010	5	276.11	338.30	341.63	480.74	176.44	221.35	240.51	318.15	617.64	819.04	75.42	416.95	539.51	77.28	1034.69	1358.54	76.16
Average													72.66			58.23			
Konkan	2007	1	0.00	3.30	0.00	0.30	20.34	50.51	0.00	8.74	0.00	3.60	0.00	20.34	59.26	34.33	20.34	62.86	32.37
	2009	1	21.62	47.36	0.00	2.86	57.32	94.37	0.00	8.21	21.62	50.22	43.05	57.32	102.57	55.89	78.94	152.79	51.67
	2010	1	2.77	4.62	0.00	0.56	36.64	59.10	0.00	13.76	2.77	5.18	53.56	36.64	72.86	50.29	39.42	78.04	50.51
Average													32.20			46.84			
Nagpur	2006	1	0.00	443.34	0.00	143.97	0.00	185.53	0.00	110.12	0.00	587.31	0.00	0.00	295.65	0.00	0.00	882.96	0.00
	2007	2	0.00	437.81	0.00	28.96	0.00	212.72	0.00	122.69	0.00	466.78	0.00	0.00	335.41	0.00	0.00	802.18	0.00
	2008	1	0.00	142.42	0.00	18.56	0.00	124.69	0.00	123.26	0.00	160.99	0.00	0.00	247.95	0.00	0.00	408.93	0.00
	2009	2	0.00	412.45	0.00	22.57	0.00	200.17	0.00	127.60	0.00	435.02	0.00	0.00	327.77	0.00	0.00	762.78	0.00
	2010	2	0.00	289.10	0.00	19.81	0.00	198.57	0.00	105.07	0.00	308.91	0.00	0.00	303.64	0.00	0.00	612.54	0.00
Average													0.00			0.00			
Nashik	2007	5	146.10	237.84	94.71	182.05	213.42	353.45	149.97	316.13	240.81	419.90	57.35	363.39	669.57	54.27	604.20	1089.47	55.46
	2008	6	178.79	354.52	69.56	218.23	195.42	382.26	185.61	366.69	248.36	572.75	43.36	381.03	748.95	50.88	629.39	1321.70	47.62
	2009	6	62.58	169.85	97.85	204.07	113.66	215.53	157.71	304.51	160.43	373.92	42.90	271.37	520.04	52.18	431.80	893.95	48.30
	2010	7	120.23	250.56	131.32	265.64	102.25	186.26	299.36	497.45	251.55	516.20	48.73	401.62	683.70	58.74	653.17	1199.90	54.44
Average													48.09			54.02			
Pune	2007	7	440.31	923.82	300.04	867.83	340.17	644.24	214.73	457.35	740.35	1791.66	41.32	554.90	1101.59	50.37	1295.25	2893.25	44.77
	2008	8	443.65	758.36	415.82	854.48	295.58	593.82	237.83	560.10	859.47	1612.83	53.29	533.42	1153.92	46.23	1392.89	2766.76	50.34
	2009	8	311.19	644.65	431.30	887.97	237.41	483.92	279.67	641.15	742.49	1532.62	48.54	517.08	1125.07	45.96	1259.57	2657.69	47.39
	2010	8	302.14	690.74	436.65	878.82	275.76	598.87	250.53	559.64	738.80	1569.57	47.07	526.29	1158.51	45.43	1265.08	2728.08	46.37
Average													47.54			47.00			

Source: Database maintained by MWRDC

Note: Canal efficiency = (Total water drawn at head ÷ Total water released in canals) X 100

Appendix 5.6

(Reference : Paragraph 5.2.7.2; Page 89)

Planned and actual cropping pattern in Ujjani project

Cropping pattern	Projected Cropped Area (ha)	Percentage of cropping pattern to total cropped area	Actual Cropped Area									
			2007-08		2008-09		2009-10		2010-11		2011-12	
			Area (ha)	Percent-tage to Actual cropped area	Area (ha)	Percent-tage to Actual cropped area	Area (ha)	Percent-tage to Actual cropped area	Area (ha)	Percent-tage to Actual cropped area	Area (ha)	Percent-tage to Actual cropped area
Kharif	140382	51.36	27558	14.79	26832.9	14.51	29638.5	16.89	22238	12.68	30515	15.96
Rabi	118272	43.28	52154	27.98	51974.2	28.10	42521.1	24.24	41080	23.43	43734	22.88
Hot Weather	3690.3	1.35	30579	16.41	32492.1	17.56	29113.8	16.60	30386	17.33	34776	18.19
Two Seasonal	7263.23	2.66	19	0.01	22	0.01	37.2	0.02	481	0.27	0	0.00
Perennial	3690.3	1.35	76058	40.81	73665.5	39.82	74119.4	42.25	81142	46.28	82121	42.96
Total projected cropped area	**273298**	**100.00**	**186368**	**100.00**	**184987**	**100.00**	**175430**	**100.00**	**175327**	**100.00**	**191146**	**100.00**
Combined cropped area under Hot Weather and Perennial	7380.6	2.7	106637	57.22	106157.6	57.38	103233.2	58.85	111528	63.61	116897	61.15
Water use in mcum	1182.36		2056.69		1690.43		1609.48		1527.60		1869.91	
Ha/ mcum	231.146		90.615		109.432		108.997		114.773		102.222	
Percentage of area actually cropped to projected cropped area	100		68		68		64		64		70	

Source: Water Account and approved cropping pattern of Ujjani project

Appendix 5.7
(Reference : Paragraph 5.2.8.1; Page 90)
Targets and achievement in respect of nine projects under CADWM

Name of the project	Project component	Target during 2010-13	Achievement during 2010-13	Percentage of shortfall
Krishna	Construction of field channels	3000	720	76
Kukadi		20000	9783	51
Chaskaman		3000	814	73
Dhom Balkwadi		13900	3500	75
Lower Wuna		378	264	30
Upper pengannga		9000	2474	73
Bhima		8404	4233	50
Nandur Madhmeshwar		29802	13138	56
Total		**87484**	**34926**	**60**
Krishna	Construction of field intermidiate and link drains	4250	6393	
Dhom Balkwadi		0	1215	
Upper pengannga		9000	2474	63
Nandur Madhmeshwar		29802	13138	56
Total		**43052**	**23220**	**46**

Source: Annual progress reports of the respective projects

Appendix 6.1

(Reference: Paragraph: 6.2; Pages 97 and 98)

Recovery performance *vis-a-vis* arrears of water charges

Year	Opening balance			Recovery due in current year			Total recovery due			Actual recovery			Percentage shortfall in recovery	Closing balance			Difference between opening balance of the year and closing balance of the preceding year
	Irriga-tion	Non-irriga-tion	Total	Irriga-tion	Non-irriga-tion	Total	Irriga-tion	Non-irriga-tion	Total	Irriga-tion	Non-irriga-tion	Total		Irriga-tion	Non-irriga-tion	Total	
2007-08	433.82	267.85	701.67	110.35	563.89	674.24	544.17	831.74	1375.91	70.47	556.54	627.01	54.43	473.70	275.20	748.90	--
2008-09	489.20	380.25	869.45	112.95	695.37	808.32	602.15	1075.62	1677.77	71.05	602.11	673.16	59.88	531.10	473.51	1004.61	120.55
2009-10	536.71	483.96	1020.67	95.00	715.11	810.11	631.71	1199.07	1830.78	69.94	732.69	802.63	66.16	561.77	466.38	1028.15	16.06
2010-11	562.07	465.03	1027.10	96.24	670.46	766.70	658.31	1135.49	1793.8	79.03	666.87	745.90	58.42	579.28	468.62	1047.90	(-) 1.05
2011-12	578.26	461.82	1040.08	102.67	508.90	611.57	680.93	970.72	1651.65	78.94	553.71	632.65	61.70	593.01	392.24	985.25	(-) 7.82
2012-13	598.91	429.45	1028.56	82.98	670.12	753.10	681.89	1099.57	1781.46	63.10	443.05	506.15	71.59	618.78	656.52	1275.31	43.31
Percentage increase in arrears in 2012-13 as compared to 2007-08														30.62	138.56	70.29	

Source: figures from 2007-08 to 2010-11 from ISR and from 2011-12 to 2012-13 from the information furnished by the WRD

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