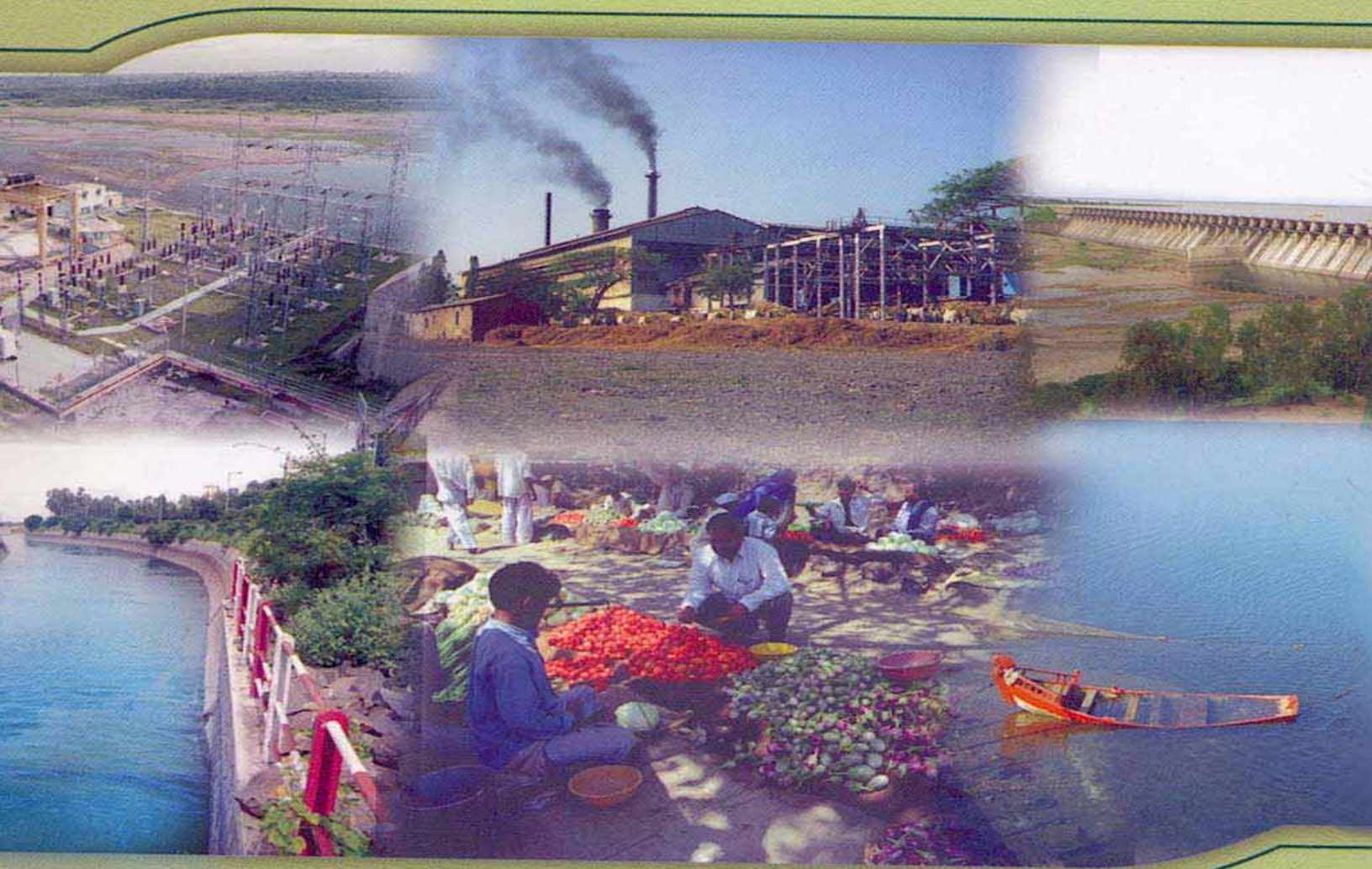




सत्यमेव जयते

# Report on BENCHMARKING OF IRRIGATION PROJECTS IN MAHARASHTRA 2004-05



**WATER RESOURCES DEPARTMENT**  
GOVERNMENT OF MAHARASHTRA, INDIA  
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## FOREWORD

Benchmarking of irrigation projects, an effective management tool, in the State is taken up by Government of Maharashtra since 2000-01. During the initial 2-3 years, emphasis was given on imparting training to field staff through various workshops held in WALMI Aurangabad.

Various indicators were tried during this period and now twelve indicators for-

- a) System Performance
- b) Agricultural Productivity
- c) Financial Aspects
- d) Environmental Aspects &
- e) Social Aspects

are being used. All major & medium and few minor projects in the State are covered under benchmarking. At State level, the number is restricted covering all major, some medium and few minor projects. The report also underwent improvement in presentation stage. State target values are decided & modified / revised whenever required.

Earnest efforts are made to improve the analysis and presentation of report considering the valuable suggestions and comments from the experts in the field, especially, Shri S.N. Sahasrabuddhe, retired Executive Director, VIDC, Nagpur.

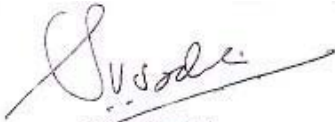
For validation of data, measures like Water Auditing, inspection of management divisions, sub divisions & section offices are carried out. Circle wise & project specific targets are fixed for benchmarking at circle level.

Action plans are prepared & implemented for improving the performance. It is expected that the advancements in the process will continue.

Comments & suggestions on this report will be highly appreciated.

It would be worthwhile to mention the efforts taken by Dr. S. M. Belsare, Under Secretary WRD, GOM, G. V. Vyawahare & P. V. Mannikar Executive Engineers, MWIC and their colleagues who have taken whole hearted efforts in preparing this report.

I would like to express thanks to Director General, WALMI, Aurangabad for getting this report printed at Aurangabad.



**S.V. Sodal**  
Secretary (CAD)

## ABBREVIATIONS

Avg Per	Average performance
BCM	Billion Cubic Metre
CAD	Command Area Development
CBIP	Central Board of Irrigation & Power
CCA	Culturable Command Area
CRT	Converted Regular Temporary
DIRD	Directorate of Irrigation Research & Development
FAO	Food & Agriculture Organisation
FY Avg	Five years average
GCA	Gross Command Area
GOI	Government of India
GOM	Government of Maharashtra
ha	Hectare
HW	Hot weather
ICID	International Commission on Irrigation & Drainage
IMD	Indian Meteorological Department
INCID	Indian National Committee on Irrigation & Drainage
IPTRID	International Programme for Technology and Research in Irrigation and Drainage
IWMI	International Water Management Institute
m	Metre
M cum/ Mm <sup>3</sup>	Million Cubic metre
Mha	Million Hectare
MKVDC	Maharashtra Krishna Valley Development Corporation
MKVWRC	Maharashtra Krishna Valley Water Resources Corporation
mm	Millimetre
MWIC	Maharashtra Water & Irrigation Commission
O & M	Operation & Maintenance
Past Max	Maximum value observed in Past
Past Min	Minimum value observed in Past
PIM	Participatory Irrigation Management
PIP	Preliminary Irrigation Programme
PLBC	Paithan Left Bank Canal
PRBC	Paithan Right Bank Canal
PWD	Public Works Department
Sq km	Square Kilometre
State Tar	State target
SGRY	<i>Sampurna Gramin Rojgar Yojna</i>
WALMI	Water And Land Management Institute, Aurangabad
WRD	Water Resources Department
WUA	Water Users' Association

WUE	Water use efficiency
AIC Akola	Akola Irrigation Circle, Akola
BIPC Buldhana	Buldhana Irrigation Project Circle, Buldhana
CADA A'bad	Command Area Development Authority, Aurangabad
CIPC Chandrapur	Chandrapur Irrigation Project Circle, Chandrapur
JIPC Jalgaon	Jalgaon Irrigation Project circle, Jalgaon
KIC Ratnagiri	Konkan Irrigation Circle, Ratnagiri
NIC Nagpur	Nagpur Irrigation Circle, Nagpur
NIC Nanded	Nanded Irrigation Circle, Nanded
NIPC Dhule	Nashik Irrigation Project Circle, Dhule
NKIPC Thane	North Konkan Irrigation Project Circle, Thane
PIC Pune	Pune Irrigation Circle, Pune
SIC Sangli	Sangli Irrigation Circle, Sangli
TIC Thane	Thane Irrigation Circle, Thane
UWPC Amravati	Upper Wardha Project Circle, Amravati
YIC Yeotmal	Yeotmal Irrigation Circle, Yeotmal

## Chapter-1 Preface

### 1.1.1 Introduction

Maharashtra occupies main portion of the Indian Sub-continent. The geographical location of Maharashtra is bounded between latitude  $16.4^{\circ}$  to  $22.1^{\circ}$  N and longitude  $72.6^{\circ}$  to  $80.9^{\circ}$  E and has an area of 307.71 thousand sq km, which is about 9.4 percent of the total geographical area of India. Maharashtra stands first amongst the major states in India in income & growth rate. The State has 720 km long coastline along Arabian Sea. The western hill ranges are almost parallel to this coastline. The State is divided into two physiographic regions of Konkan and rest of the State (Deccan Plateau). The Deccan Plateau spread over on the east side of



*ghat* has west-east slope. In general, the altitude of the plateau varies between 300 to 600 m. Maharashtra has Gujarat on north-west, Madhya Pradesh in north, Chhattisgarh on east and Andhra Pradesh, Karnataka and Goa in south.

### 1.1.2 Physiography

The State is divided into five major regions physiographically:

i) Konkan strip on western side (ii) Sahyadri ranges (iii) Plateau on eastern side (iv) Hilly ranges of Satpuda and adjacent area on north and (v) Hilly and forest region of north-south Wainganga basin on East side of State.

#### 1) Konkan Strip

The narrow strip of land extending from Damanganga basin in north to the border of Goa State in south is the Konkan. It has Sahyadri ranges on east and Arabian Sea on west. The Konkan strip is about 53 to 60 km wide and 500 km long along north-south. The widest stretch is about 100 km. Width decreases as one proceeds towards south. The region becomes hilly and altitude increases from the depressed coastline towards east.

#### 2) Sahyadri Ranges

These continuous mountain ranges extend almost parallel to the western coastline. It is known as Western *Ghat*. The average height of Sahyadri in Maharashtra is 900 m. It is more in the north and diminishes towards south.

#### 3) Eastern Plateau Region (Deccan Plateau)

The height of this plateau goes on diminishing from 600 m on western side to 300 m in the Wainganga basin on east. This region is formed from lava of igneous rocks.

All the districts of Khandesh<sup>1</sup>, Marathwada<sup>2</sup>, Western Maharashtra and the western districts of Vidarbha<sup>3</sup> fall in this region.

<sup>1</sup> Khandesh includes Dhule, Nandurbar & Jalgaon districts

<sup>2</sup> Marathwada includes Aurangabad, Jalna, Parbhani, Nanded, Osmanabad, Latur, Hingoli & Beed districts

<sup>3</sup> Vidarbha includes Akola, Washim, Amravati, Yeotmal, Wardha, Nagpur, Bhandara, Gondia, Chandrapur, Buldhana & Gadchiroli districts.

4) Satpuda Ranges and Tapi – Purna basin on North

Satpuda hill ranges lie on the northern boundary of the State. This region is spread over in the districts of Amravati, Akola, Jalgaon and Dhule.

5) Eastern Region Consisting of Wainganga basin

Eastern region comprises of eastern side of the State and flat paddy field region lies along both the banks of the river at an elevation of about 300 m. On the eastern side of this flat region along the Maharashtra - Chhattisgadhd boundary are the hills of different geological formations other than the Deccan Trap. Many eastern tributaries of Wainganga originate from this hill range. The height of this hilly plateau is around 800 m.

Detailed information with regard to river basins, availability of water resources, climate, rainfall, agro climatic zones, etc of Maharashtra is given in Appendix VII

**1.2.0 Rainfall during 2004-05**

The State received rains from South West monsoon from 10<sup>th</sup> June 2004. The proportion of rainfall received during the period from 10<sup>th</sup> June to 31<sup>st</sup> October 2004 was as low as 86.1% of State's normal rainfall. As per IMD standards; in 15 districts, it was deficient (41 to 80%) out of 33 districts in the State (excluding Mumbai city & Mumbai suburb). In 10 districts it was 81 to 100%, whereas in 8 districts it was above 100% of the normal. As per the standards specified by IMD, out of 353 talukas in the State, in 9 talukas the rainfall received was scanty (up to 40% of normal), in 159 talukas it was deficient (between 41% to 80%) whereas in 45 talukas it was excess - (i.e.20% or more above normal). The region wise breakup of 168 talukas which received rainfall upto 80% of normal, was as follows:-

Region	No. of talukas
Central Maharashtra (Nashik & Pune Divisions)	14
Vidarbha	99
Marathwada	47
Konkan	8

The steep downfall in the rainfall of State since last three years, consequently affected the groundwater as well as surface water potential of the projects.

Thus, the overall picture of the rainfall received during this monsoon (2004-05) in the State was not at all satisfactory.

**1.3.0 Irrigation Development during Post-independence Period**

Maharashtra State as of today came into existence in 1960. The increasing population was facing shortage of food grains. This has led to the need of increasing agricultural production. By giving priority to agricultural development, attempt has been made to achieve irrigation development in a planned manner.

Hardly, 0.274 Mha, irrigation potential was created in the State during pre-plan period i.e. before 1950. Agriculture has been the prominent occupation to provide food and fiber to the growing population of the State. Adequate, timely and guaranteed water supply is of paramount importance in agriculture production and irrigation development plays a key role in alleviating rural poverty. The State has created 3.913 Mha irrigation potential using surface water resources by 2004 through 53 major, 312 medium and 2457 state sector minor irrigation projects.

Besides 55 major, 121 medium, 852 State Sector minor projects and 48 lift irrigation projects are under construction in the State. The total investment in the irrigation sector up to 1 April 2004 is around Rs. 337.50 billion. The ultimate irrigation potential, through surface water and ground water resources, has been estimated as 12.6 Mha.

### **1.3.1 Supply System**

Generally supply of water for irrigation is through distribution network of canals off-taking either from dam or from pick-up-weir. The distribution network consists of main canal, branch canal, distributary, minor and field channels. The open canals are either lined or unlined, but mostly the systems are unlined.

Water is supplied to irrigators via distribution network through outlets. In addition, there are individual, co-operative, Govt. owned lifts on reservoirs, rivers and canals. Normally there is major area under gravity irrigation and small part under lift irrigation in most of the projects. Some projects are specially lift irrigation projects with storage reservoir or storage reservoir with series of Kolhapur type weirs downstream of reservoir. In most of the major & medium irrigation projects, water reserved for non irrigation (domestic and industrial) use varies between 15 % to 25 %. While in deficit years the non-irrigation use in projects goes even up to 50%.

The supply of water for domestic and industrial purpose is mostly made through pipeline either from reservoir or from river.

The projects selected for benchmarking are having major area under flow irrigation with small percent under lift irrigation. The lifts are on main canals as well as reservoirs. Most of the projects selected supply irrigation water for eight months i.e. monsoon Kharif and Rabi and very small proportion for Hot Weather or for perennial crops. There is a practice to use water saved in Kharif and Rabi season for Hot weather or Perennial crops.

### **1.3.2 Crops Irrigated**

The crops grown vary significantly between projects. The main crops grown in project command are sorghum, wheat, gram, sunflower, maize, L. S. cotton, vegetables, groundnut, sugarcane, banana, paddy etc.

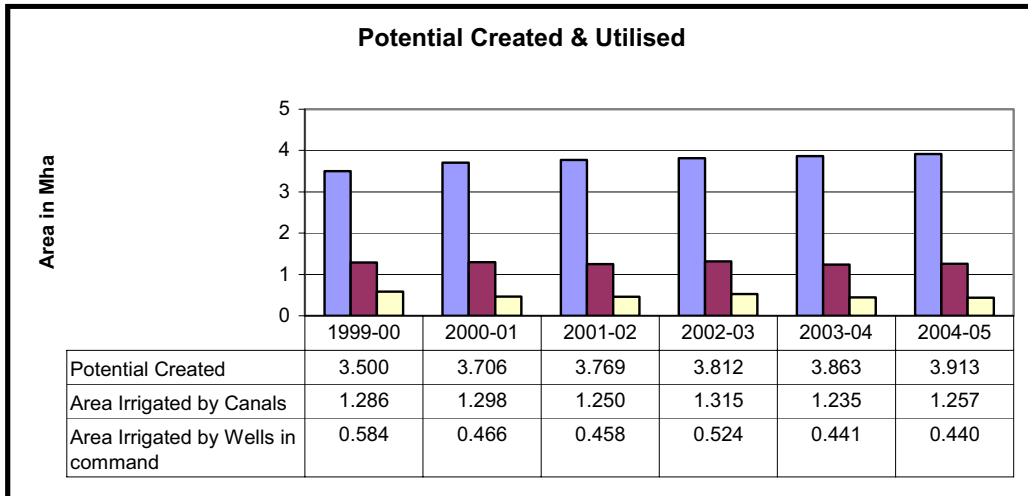
### **1.3.3 Management of Systems**

The irrigation systems are constructed and mostly managed by government. Operation and maintenance of irrigation projects is looked after by irrigation divisions, which are administratively controlled by circle office. GOM has taken policy decision to supply water for irrigation through Water Users' Associations only. Accordingly the Act is passed by the Government. Water Users' Associations are formed in command areas of irrigation projects and irrigation management of area under their jurisdiction is transferred to them. Recently, a major project Waghad in North Maharashtra region is handed over to Federation of WUAs for management.

### **1.4.0 Present Status of Irrigation Utilisation:**

In spite of various measures taken so far, there is a gap between potential created and utilised.

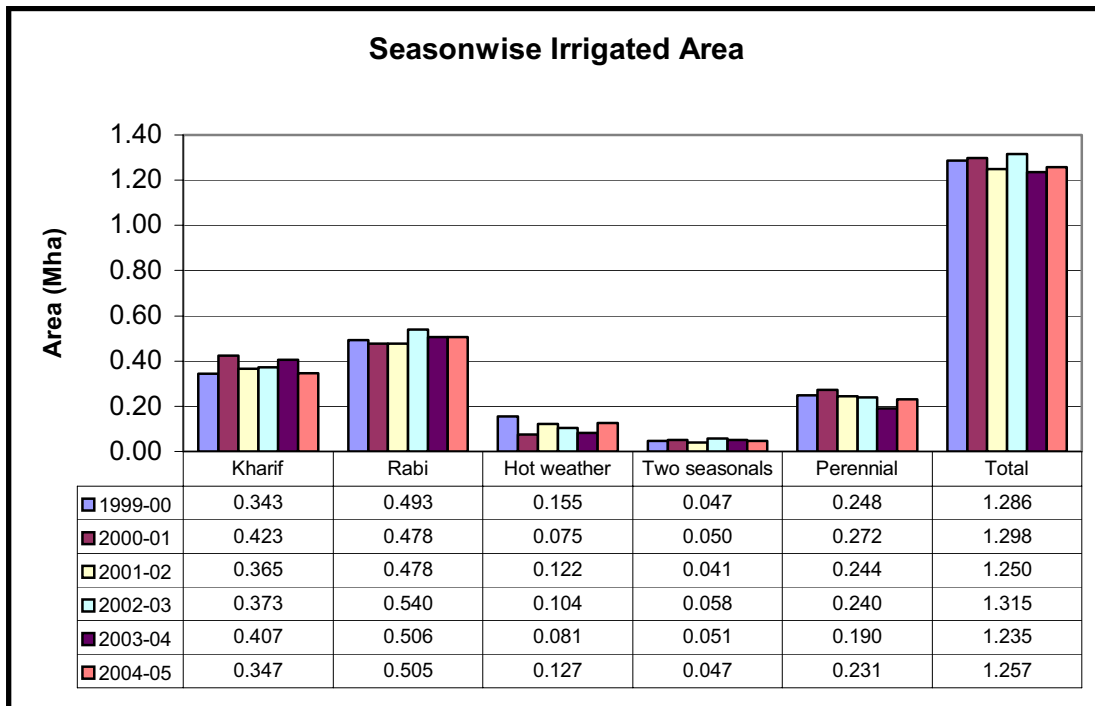




The overall reasons for less utilisation are as follows:

- i) Low water yield in the reservoirs
- ii) Diversion of irrigation water to non-irrigation uses
- iii) Tendency of farmers to grow cash crops which are highly water intensive like sugarcane
- iv) Thin & scattered irrigation resulting in low efficiency
- v) Low utilisation during kharif (Rainy) season
- vi) Reduction in storage capacity due to silting
- vii) Poor/approximate assessment of the irrigated area in the command
- viii) Non accounting of irrigated area outside the command (influence area)
- ix) Poor maintenance of the infrastructure due to financial constraints
- x) Non participation of beneficiaries.

Year wise potential created and corresponding season-wise irrigated area during last 5 years is shown below.



### **1.4.1 Participation of Beneficiaries in Water Resources Management**

National Water Policy 2002 and Maharashtra State Water Policy advocate participatory irrigation management. In view of these, water users associations were setup in command areas of various projects in different parts of the State. By the end of 2004-05 in all 774 WUAs were in full operation with operational area of 2.51 lakh ha. Besides this the number of WUAs which have been registered and entered into agreement during 2004-05 was 956 covering an area of about 4.33 lakh ha.

Looking at the slow pace of PIM in last decade and to bridge the gap between irrigation potential created and its actual utilization and to optimise the benefits by ensuring proper use of surface & ground water by increased efficiency in distribution, delivery, application and drainage of irrigation systems and for achieving this objective, to give statutory recognition to the constitution & operation of WUAs, an act has been passed by the State legislature. The act is known as "Maharashtra Management of Irrigation Systems by Farmers Act, 2005".

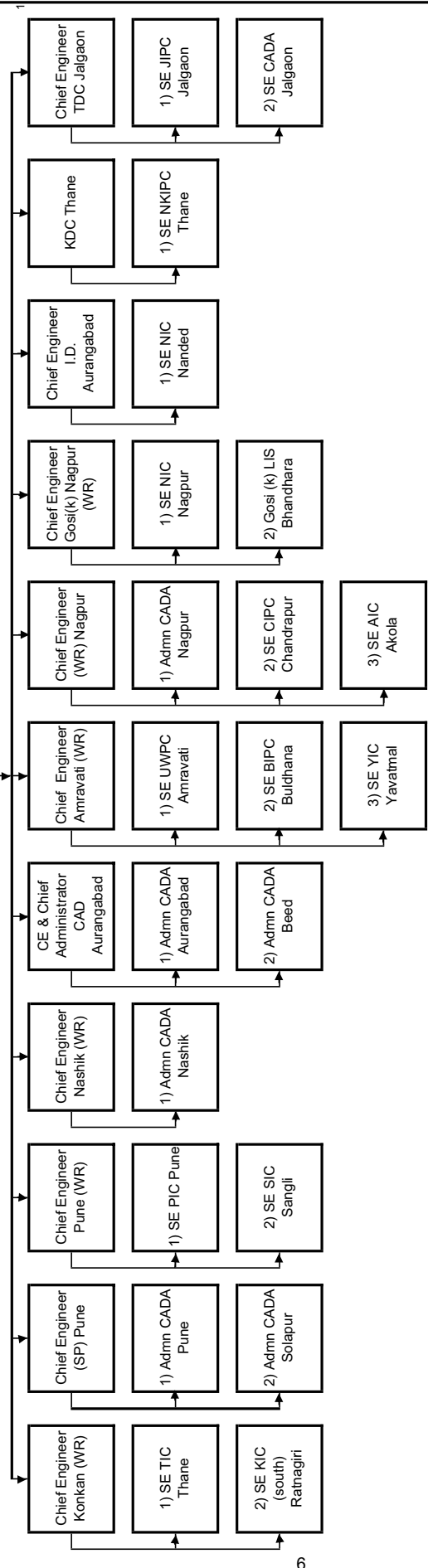
As per this act, all the beneficiaries in the command of a distributary / minor will become the members of WUA, once the area is notified under the act.

### **1.5.0 Present Organisational Set up**

The organisational set up for irrigation management comprises of section office at the lowest level looking for an area of about 3000 to 4000 ha. The section office is headed by a sectional officer having staff for O & M of the area. The subdivision dealing with four to five sections is headed by sub divisional officer/engineer and works under the control of division. Thus the division is looking after four to five subdivisions with sixteen to twenty five sections and headed by the Executive Engineer in charge of the irrigation projects. The management circle headed by the Superintending Engineer controls three to four divisions. The regional head of the Superintending Engineers (four to five circles) is either Chief Engineer or the Chief Administrator in case of CAD projects.

The Superintending Engineers in-charge of irrigation circles are responsible for full utilisation of the water stored in reservoir and maintenance of public utilisation system, as well as recovery of water charges through their subordinate offices. The organisation chart of department is enclosed herewith.

## Organisation Chart of Irrigation Management Secretary (CAD)



## Chapter - 2

### Benchmarking of Irrigation Projects

Benchmarking can be defined as a systematic process for securing continual improvement through comparison with relevant and achievable internal or external norms and standards.

#### 2.1.0 Background

The exercise was conducted for 6 major projects in 2001-02. The number of projects covered during 2002-03 was 254 and instead of presenting data of all these projects individually, irrigation circle was considered as unit for evaluation of performance. Here also it was observed that some of the characteristics of projects under a circle are not identical and to make the comparison still on better grounds, projects under a circle in a sub basin are grouped together & comparison is made with other projects in a particular plangroup.

This is the fourth consecutive report of benchmarking of irrigation projects in the State with 262 projects and 12 indicators. The plangroup wise number of projects selected for benchmarking during 2004-05 is as follows.

Sr. No	Plangroup	Number of Irrigation Projects			Total number of projects
		Major	Medium	Minor	
1	Highly Deficit	1	23	6	30
2	Deficit	13	55	33	101
3	Normal	21	34	15	70
4	Surplus	3	21	3	27
5	Abundant	11	11	12	34
	<b>Total</b>	<b>49</b>	<b>144</b>	<b>69</b>	<b>262</b>

#### 2.2.0 About this report

Following 12 indicators are selected for benchmarking in 2004-05 grouped in different key activity areas.

##### **System Performance**

- 1 Annual Irrigation Water Supply Per Unit Irrigated Area
- 2 Potential Created And Utilised

##### **Agricultural Productivity**

- 3 Output (Agricultural Production) Per Unit Irrigated Area
- 4 Output (Agricultural Production) Per Unit Irrigation Water Supply

##### **Financial Aspects**

- 5 Cost Recovery Ratio
- 6 Total O&M Cost Per Unit Area
- 7 Total O&M Cost Per Unit Volume Of Water Supplied
- 8 Revenue Per Unit Volume Of Water Supplied
- 9 Mandays For O&M Per Unit Area

10 Assessment Recovery Ratio

A. Irrigation

B. Non Irrigation

### **Environmental Aspects**

11 Land Damage Index

### **Social Aspects**

12 Equity Performance

**Most of the major projects are multipurpose projects and, therefore, Cost recovery ratio and Revenue per unit volume of water supplied are compared for irrigation use & non-irrigation use separately as well as combinely.**

As the past data for separate analysis could not be made available by field officers immediately, the separate comparison is for 2004-05 only. Comparison including past data, will be possible in years to come.

The report is available on [www.mwic.org](http://www.mwic.org)

### **2.3.0 Methodology**

The data presented in this report is based on information collected from each of the circle in-charge of the project.

The following process was used in development of this report.

- Irrigation projects are selected, representing the main geographical regions of State and of categories viz. major (CCA more than 10000 ha), medium (CCA more than 2000 ha and below 10000 ha) and minor (CCA less than 2000 ha).
- For consistency in monitoring & evaluation, projects considered (same projects) for benchmarking during 2003-04 are continued this year also.
- **To exercise control over the management divisions, reshuffling of some projects is carried out during 2004-05. With this reshuffling, the number of management circles have been reduced from 25 to 21 (locations are shown in enclosed map). Therefore, the indicator wise values for 2003-04 of this report may not tally with those given in last year's report.**
- Projects under two circles JIPC Jalgaon & Gosikhurd Lift Irrigation circle, Bhandara are under construction and the distribution network is not completed, therefore, not considered for benchmarking.
- Data is collected in spreadsheet and analysed in MWIC office.
- **The data is correlated with water accounts (2004-05) of relevant projects.**
- **The presentation for every indicator is done with past-past (5 year average), recent past (2003-04) and present year (2004-05) in order to compare the performance with predecessors as well as own performance of last year.**
- The draft report is scrutinised in MWIC & Mantralaya, Mumbai.

- Reasons for deviation from last year's performance are called from each circle.

**For better monitoring and looking to the number of projects the analysis is carried out considering irrigation circle as a unit and projects therein with similar plangroups of sub basins.** Performance of projects in a circle against each indicator is collective performance as given in the Appendices.

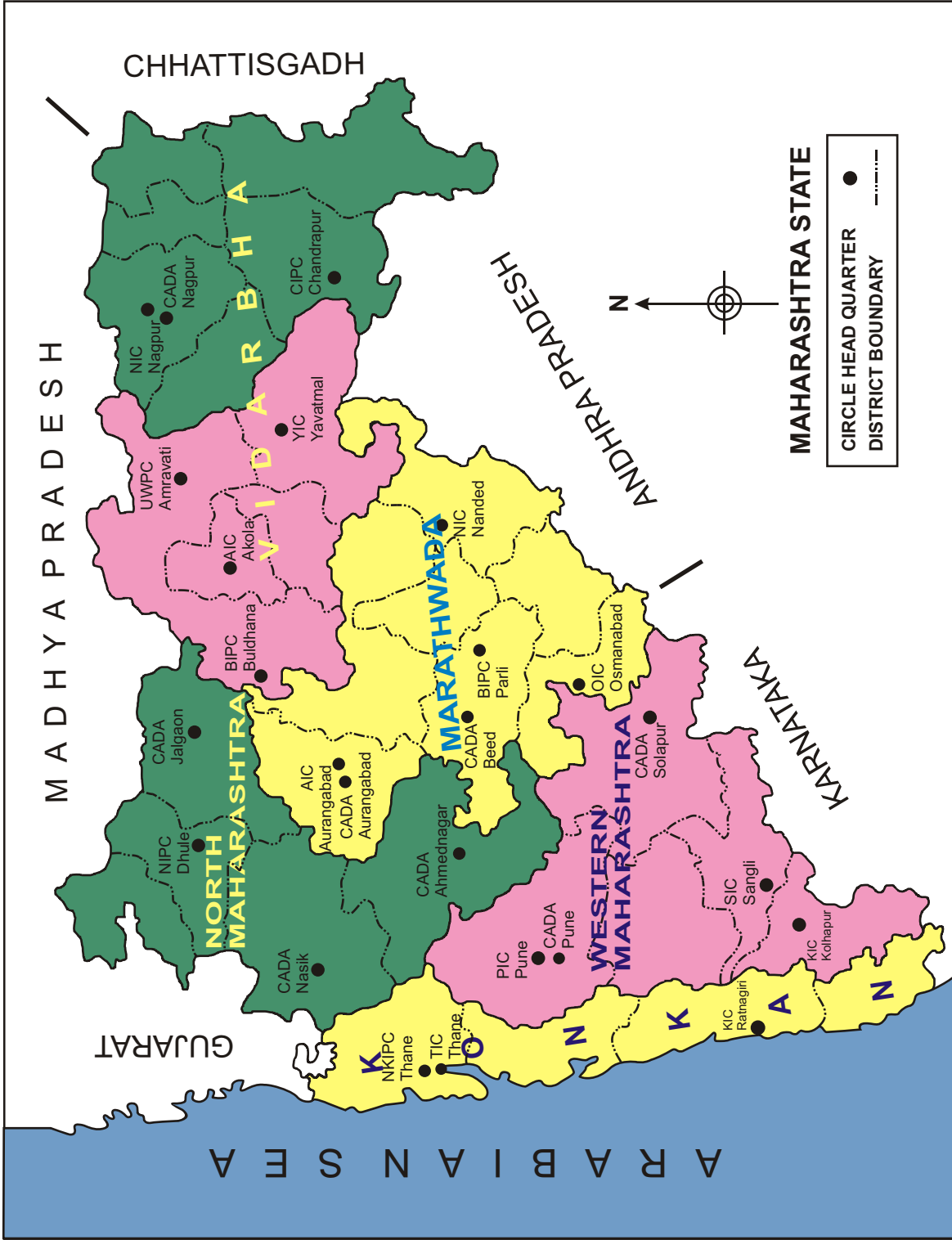
- Ranking of circles in different plangroups is done by arranging the performance for 2004-05 in ascending order.
- Based on performance for 2004-05, indicator wise average performance is found out for the plangroup of circles under consideration, setting aside the exceptionally high/low values.
- **State targets for indicator No III & IV are decided plangroup wise.** However for other Indicators target value is common for all plangroups. The targets are different for major, medium & minor projects for indicator No. I, VI, VII, & VIII.
- For benchmarking of projects at circle level, each circle has defined its own targets considering specific conditions of project areas.
- Target values are revised with experience gained in the process.
- **For financial indicator of output per unit irrigated area and output per unit irrigation water supply, fixed prices of 1998-99 are considered to obviate effect of price rise.**
- Good as well as fair achievements and performance below average is separately shown.
- Some circles are not having either major, medium or minor projects; therefore, only relevant circles are shown in graphs of each indicator. Thus total of circles may not tally to 21 in each graph, for example for major projects category, there are only 15 circles.
- At a glance evaluation of performance of all circles with respect to each indicator is also given.
- There are 2457 completed minor irrigation projects in the State. Therefore, it has been decided to carryout benchmarking and monitoring of minor projects at circle level itself. To get an idea about performance of minor projects, some sample schemes which were considered in last year's report are analysed and included in this report.
- Actions taken by GOM for improvement of performance are included in Chapter-5.

#### **2.4.0 Overview Of Irrigation Projects**

An overview showing details such as sub basin, designed and actual storage during the year, command area, crops grown, etc. is enclosed as Appendix – V



MAP SHOWING LOCATION OF IRRIGATION CIRCLES





## Chapter - 3

### Performance Indicators

**3.0.0** As stated earlier, Chapter 2 of this report provides an idea about the five key activities, mentioned below.

- a. System Performance
- b. Agricultural Productivity
- c. Financial Aspects
- d. Environmental Aspects
- e. Social Aspects

#### **3.1.0 System Performance**

Delivery of water, to meet user requirement for irrigation and other purposes, is the primary focus of the project authorities. The water delivery process is strongly influenced by physical, climatic, economic and other factors and the project authority has limited control over some of these factors. In particular, the prevailing climatic conditions largely determine both, the available water resources and the crop water requirements in any season. The main task of the project in-charge is to manage the system so as to optimise the use of available resources in order to meet agreed user needs in an effective and efficient manner.

#### **3.1.1 Annual Irrigation Water Supply Per Unit Irrigated Area**

Annual irrigation water supply per unit irrigated area is total quantity of water supplied for irrigation in all the seasons of a year divided by the irrigated area in that year.

Annual irrigation water supply per unit irrigated area varies with water availability, cropping pattern, climate, soil type, system conditions, system management etc.

As a measure of efficiency of irrigation system, a target of 7692 m<sup>3</sup>/ha is set for major and medium projects and 6667 m<sup>3</sup>/ha for minor projects.

#### **3.1.2 Potential Utilised & Created**

This is the ratio of potential utilised (area irrigated) to created irrigation potential of the project.

The irrigation potential created through large investments should be fully utilised. However the utilisation is governed by the availability of water in the reservoirs. **Therefore, reduction in created irrigation potential is effected proportionate to availability of water for irrigation.**

#### **3.2.0 Agricultural Productivity**

In Maharashtra, 58% population depends on agriculture, thus production per unit area as well as per unit water is vital for State economy.

The indicators chosen for benchmarking are

- 1) Output per unit irrigated area.
- 2) Output per unit irrigation water supply.

#### **3.2.1 Output Per Unit Irrigated Area**

Output per unit irrigated area is the output in rupees of agricultural production from irrigated area divided by total irrigated area.

As the population grows, the land holding per capita is going to be reduced. Secondly there is limitation on land to be brought under irrigation. Thus it is important

that the output per unit area has to be increased with efficient water and land management, improved seeds and adoption of latest technology.

The efforts have to be made to increase output by diversification of cropping pattern, better farm practices and judging the market needs. However, water is the only input in agriculture on which service provider has control. Therefore to have an idea about trend of production in the command, this indicator has been adopted. The yield data of various crops is collected through agriculture department. The market prices are obtained from Agricultural Produce Market Committees located in each taluka. In respect of sugarcane, prices are obtained from sugar factories in the area and for cotton, from Cotton Federation. The prices of 1998-99 are considered as base price for all the remaining years & output is worked out accordingly. The plangroup wise targets set for different categories of projects are given in Appendix-II

### **3.2.2 Output Per Unit Irrigation Water Supply**

Output per unit irrigation water supply is value in rupees of agricultural production from irrigated area divided by total quantity of water supplied for irrigation.

The output per unit irrigation water supply is a crucial measure of optimal use of water. The indicator shows how efficiently water is used to get maximum output (agricultural produce).

### **3.3 Financial Performance**

It is vital for any system to be self-sustainable that at least O & M expenditure is met from its own revenue.

In Maharashtra, it is proposed to levy the water charges to all users, including irrigation & non-irrigation use on volumetric basis to encourage efficient water use. Presently the practice of volumetric supply is in use for WUAs, Domestic and Industrial use.

The indicators chosen for financial performance are given below.

- 1) Cost Recovery Ratio.
- 2) Total O & M Cost per unit area
- 3) Total O & M Cost per unit Volume of Water Supplied.
- 4) Revenue per unit water supplied.
- 5) Mandays for O & M per unit area.
- 6) Assessment Recovery Ratio

#### **3.3.1 Cost Recovery Ratio**

It is the ratio of recovery of water charges to the cost of providing the service. It is imperative to devise water rates and mechanism for recovery of water charges for irrigation use in such a manner to meet, at least, annual cost of management, O & M of system and recovery of some portion of capital investment on the projects in order to make the system self sustainable. Theoretically the cost recovery ratio should be at least equal to one.

Due to the efforts taken at all levels the recovery of water charges has improved and the O & M cost has come down. This resulted in enhancing the cost recovery ratio more than one.

As most of the major projects are multipurpose projects supplying water for irrigation as well as non-irrigation uses, the analysis is carried out separately for irrigation use & non-irrigation use. Similarly combined analysis is also carried out to enable comparing the performance with the past.

### **3.3.2 Total O & M Cost Per Unit Area**

Total O & M cost per unit area is the ratio of total O & M cost incurred for management of the system and area irrigated during the year. The total O & M cost includes cost of maintenance as well as establishment charges. The annual maintenance cost incurred does not include cost of modernisation. Establishment charges include salary paid to staff working in a management section.

The O & M cost per unit area should be as minimum as possible.

Government of Maharashtra has prescribed yearly O & M norms per ha., excluding establishment cost. The staff engaged in management of irrigation system and it is permanent. The expenditure on them is chargeable to the project, irrespective of whether there is irrigation or otherwise. The O & M cost per unit area is increased in projects where there is less irrigation.

### **3.3.3 Total O & M Cost Per Unit Water Supplied**

Total O & M cost per unit water supplied is obtained by dividing total O & M cost by total quantity of water supplied for irrigation and non-irrigation use during the year.

Total O & M cost per unit volume of water supplied should be as minimum as possible to achieve economy in supply.

### **3.3.4 Revenue Per Unit Water Supplied**

It is the ratio of total revenue and quantity of water supplied for irrigation & non irrigation use during the year.

Revenue per unit volume of water supplied is very important measure as every drop of water is to be used efficiently and economically.

The comparative analysis given in Appendix-VIII shows that where non-irrigation supply is prominent as well as hot weather or perennial irrigation is more, the revenue per unit volume of water supplied is more owing to higher rates.

### **3.3.5 Mandays For O & M Per Unit Area**

Mandays for O & M per unit area means number & staff engaged including CRT, Work-charged and daily rated staff engaged in management of the system divided by area irrigated. It is always advisable to have optimum number of mandays for O & M. But with fixed establishment, there is less scope for improvement. The reduction in irrigation area due to less availability of water for irrigation and more reservation for non-irrigation uses results in abnormal increase in the ratio. Considering the sanctioned staffing pattern for management section, the target of three mandays/ha is considered to be ideal one.

### **3.3.6 Assessment Recovery Ratio**

This indicator is split up into two components viz

- a) Irrigation
- b) Non Irrigation

In case of both the uses, there are arrears of water charges in many projects due to some or other reasons. One of the reasons being postponement of recovery during draught years.

It is the ratio of recovery of water charges during 2004-05 and assessment of Rabi & Hot Weather of 2003-04 for irrigation and Kharif 2004-05 and for non-irrigation uses of the year 2004-05.

The purpose of introducing this indicator is to check whether the water charges assessed during a year are totally recovered or not. For this indicator, arrears are not considered.

### **3.4 Environmental Aspects**

#### **3.4.1 Land Damage Index**

Land damage index is expressed as percentage of land damaged to irrigable command area of the project.

The lands under irrigation become saline or waterlogged due to excessive use of water resulting in low productivity. This problem is faced in areas where high water intensive crops are grown year after year with unscientific methods of irrigation like flooding. Water logging and salinity occur in soils with poor drainability. In Maharashtra, black cotton soil, which is highly impervious, is found on extensive area. Directorate Irrigation Research & Development, Pune is regularly monitoring & taking remedial measures for reclamation of damaged lands in commands of projects.

### **3.5 Social Aspects**

#### **3.5.1 Equity Performance**

Most of the schemes are gravity systems with canals and distribution system. The command area proportionate to effective storage is divided equally in to head, middle & tail reaches. Equity performance means ratio of area irrigated (Canal flow and lifts on canal) to projected irrigable area in head, middle and tail reaches expressed as percentage. This indicator gives clear picture as to whether the irrigation facility is provided equitably to head, middle & tail reach farmers or otherwise.

The benefit of irrigation should be given to the beneficiaries in head, middle & tail reach equitably. Ideally for equity, this ratio should be equal to one for head, middle as well as tail reaches.

## Chapter - 4

### Observations & Conclusions

**4.0.0** The analysis of data received from field offices is carried out in MWIC office. The analysis is based on plangroups of sub basins as delineated by MWIC i.e. the projects in one plangroup under a circle are grouped together & their combined performance is found out. For example, the projects under AIC Akola falling in deficit sub basins are grouped in AIC Akola (deficit) & those falling in normal sub basins are grouped in AIC Akola (normal).

For the sake of convenience the observations are given in front of the respective graphs.

Though the graphs show indicator wise performance of all the circles, the observations are given particularly for circles having notable difference in performance with respect to past and State target. The values for State targets are given in Appendix-II

The categorization of performance is given in Appendix-III. Based on categorization of performance (Very Good, Good, Moderate, Fair & Below Average) at a glance evaluation of indicator wise performance of various circles for major, medium & minor projects for 2003-04 and 2004-05 is given in Appendix-IV.

Field officers are expected to decide action plans for improvement of performance of projects under the circle to achieve the benchmark and the State target.

An overview showing details such as sub basin, designed and actual storage during the year, command area, crops grown, etc. is enclosed as Appendix - V

In addition to above categorization of performance, an attempt has been made for the quantitative analysis of performance this year (Appendix-VI). This quantitative analysis is in a primitive stage and refinements will be carried out after receiving the comments and suggestion in this respect.

#### **4.1.0 Observations:**

##### **Indicator I: Annual irrigation water supply per unit irrigated area**

- 1) In Bhima project under CADA Solapur (highly deficit) the water use per ha is considerably reduced by bringing more area (134516 ha) under irrigation.
- 2) Annual irrigation water use per ha on Wan project in UWPC Amravati (deficit) is quite low (3759 m<sup>3</sup>) as compared to its performance in 2003-04 and the State target. This is due to execution of only one rotation each in Rabi & HW of 2004-05.
- 3) In NIC Nanded (deficit), it is reduced from 8156 to 4250, owing to reduced rotations due to lesser availability in two out of three major projects viz. Manar and Purna
- 4) The ratio in CADA Jalgaon (deficit) is reduced from 13137 to 5146 cum/ha. The reason being identifying area under irrigation on nallas & wells (through water audit) in the command area of Girna project.
- 5) Nalganga project under AIC Akola (deficit) has utilised 9622 m<sup>3</sup> of water for irrigating a unit area. Excessive water use in HW (with low WUE) resulted into the excess annual water use per unit area as compared to the target value.
- 6) In projects under CADA Beed (deficit), water was not available in all the three projects viz. Majalgaon, Terna & Manjra. However, 3672 ha were irrigated through flow & lift on Majalgaon project from water made available through Paithan RBC, a feeder canal from Paithan Dam. There was no sufficient driving head for letting discharge in Majalgaon RBC, causing low discharge resulting in high conveyance losses and therefore, water use was 11975 cum/ha, more than last year and State target.
- 7) In Jayakwadi project under CADA A'bad (deficit), there was no demand for Rabi due to sufficient rains. Only 15 percent of planned water use could be achieved in Rabi. The canal system is deteriorated, as it runs through deep Black Cotton soil and it is 25 years old long canal (208 Km) system. The distribution system is unlined.
- 8) In Upper Penganga Project under NIC Nanded (normal), only 4 percent water was available and therefore, protective irrigation was given. Hence, water use per ha is less.
- 9) In CADA Pune (normal) the ratio has come down from 6033 to 5158 cum/ha as only two rotations were given each in Rabi & HW seasons in Ghod project.
- 10) Irrigation water supply per unit irrigated area (7422 cum/ha) for Bor project under CIPC Chandrapur (normal) is close to the State target.
- 11) WUE in NLBC, Pawana & Khadakwasla projects improved over the past. Particularly in Khadakwasla, the improvement was from 46 ha /Mcum to 107 ha/Mcum. Therefore, the annual irrigation water supply under PIC Pune (normal) is reduced from 10726 cum/ha in 2003-04 to 8286 cum/ha in 2004-05 resulting in improvement in performance from 'Below Average' to 'Good' ranking.
- 12) The ratio increased in CADA Nashik (normal) owing to reduced WUE (from 151 ha/Mcum in 2003-04 to 80 ha/Mcum in 2004-05 ) in Mula Project. Investigations are required in this respect.
- 13) For Lower Wunna project under NIC Nagpur (normal) the ratio is 63 percent more than the State target, as it is an ongoing project with staff less conversant with

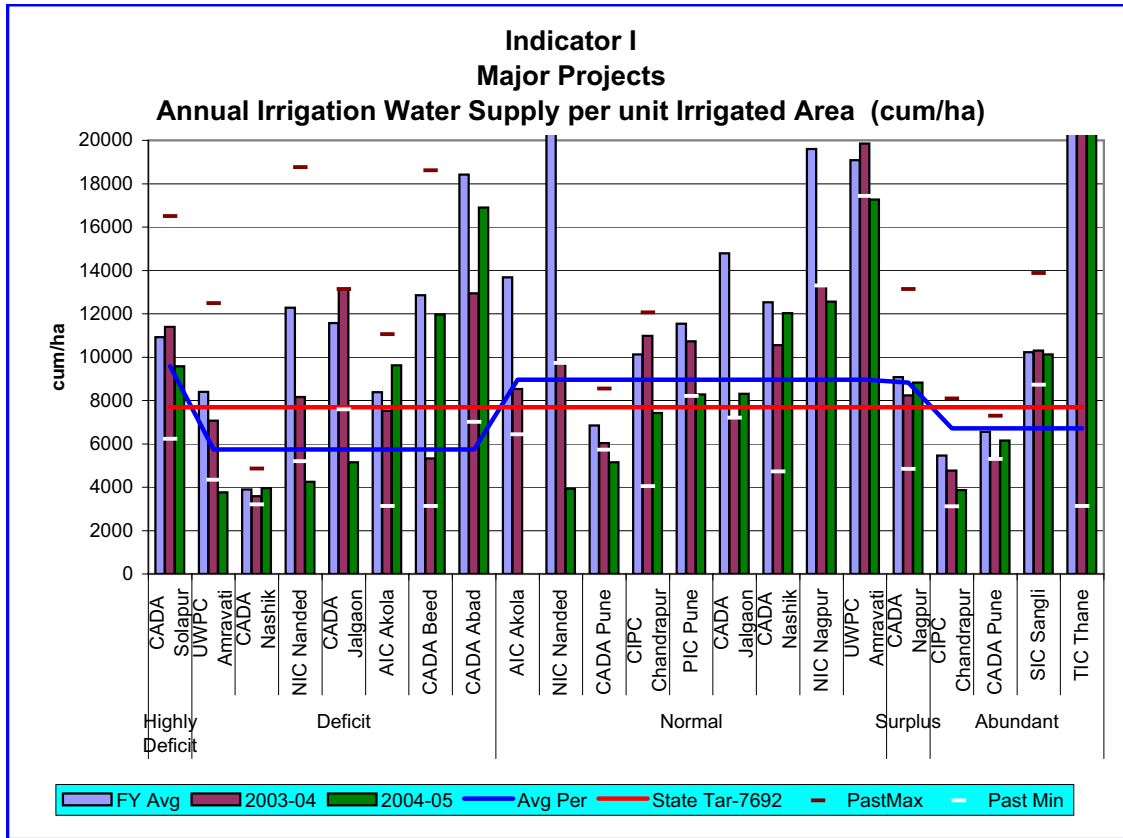
IWM. The cultivators are not acquainted with the irrigation practice. However the project has improved it's performance compared to past to some extent.

14) Upper Wardha project in UWPC Amravati (normal) has supplied irrigation water at exceptionally high rate (17268 cum/ha). However as compared to its past performance, the project authorities have successfully lowered down the water use rate during the year 2004-05. Still there is scope for improvement.

15) On Pench and Itiadh projects in CADA Nagpur (surplus) water use is slightly more (10428 & 9096 cum) than State target, but it is less than five years average performance. Bagh & Itiadh are basically Kharif dominated projects, of which irrigation water requirement is dependent upon the rainfall in the command area. In case of Pench & Itiadh, uneven distribution (with respect to time) of low rainfall, scattered area under irrigation and more transit losses due to old canal system are the main causes for more water use than target. Water use in case of Bagh appears to be low as only two rotations were implemented for supplying irrigation water.

16) Asolamendha and Dina projects under CIPC Chandrapur (abundant) have only Kharif irrigation. Irrigation water supply is in the form of protective irrigation, on an agreement basis. The projects have improved their performance during the year 2004-05 (3236 m<sup>3</sup>/ha & 4564 m<sup>3</sup>/ha respectively) as compared to past.

17) WUE in Bhatsa and Surya projects under TIC Thane (abundant) improved from 20 to 45 & 19 to 41 ha/Mcum respectively, bringing down the value to 24784 cum/ha. Still there is large scope for improvement in performance in all the four projects viz. Bhatsa, Surya, Kal and Rajanala.



Plangroup	Circle	FY Avg	2003-04	2004-05	PastMax	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	10919	11397	9572	16504	6228	9572	M
Deficit	UWPC Amravati	8399	7064	3759	12491	4339	5745	BA
	CADA Nashik	3901	3586	3960	4863	3205		F
	NIC Nanded	12283	8156	4250	18763	5191		F
	CADA Jalgaon	11566	13137	5146	13137	7588		F
	AIC Akola	8378	7528	9622	11048	3125		M
	CADA Beed	12856	5324	11975	18612	3125		BA
	CADA Abad	18415	12951	16899	21379	7013		BA
Normal	AIC Akola	13682	8529	No Water	22047	6438	8962	---
	NIC Nanded	20386	9731	3927	28105	9731		F
	CADA Pune	6842	6033	5158	8543	5722		F
	CIPC Chandrapur	10125	10979	7422	12060	4051		VG
	PIC Pune	11544	10726	8286	21296	8210		G
	CADA Jalgaon	14792	7201	8315	22983	7201		G
	CADA Nashik	12538	10553	12033	36327	4726		BA
	NIC Nagpur	19608	13302	12560	25356	13302		BA
	UWPC Amravati	19086	19848	17268	21005	17432		BA
Surplus	CADA Nagpur	9071	8232	8833	13142	4842	8833	G
Abundant	CIPC Chandrapur	5457	4769	3870	8092	3118	6715	F
	CADA Pune	6554	5298	6155	7295	5298		M
	SIC Sangli	10234	10307	10120	13871	8720		F
	TIC Thane	38106	34996	24784	87671	3125		BA

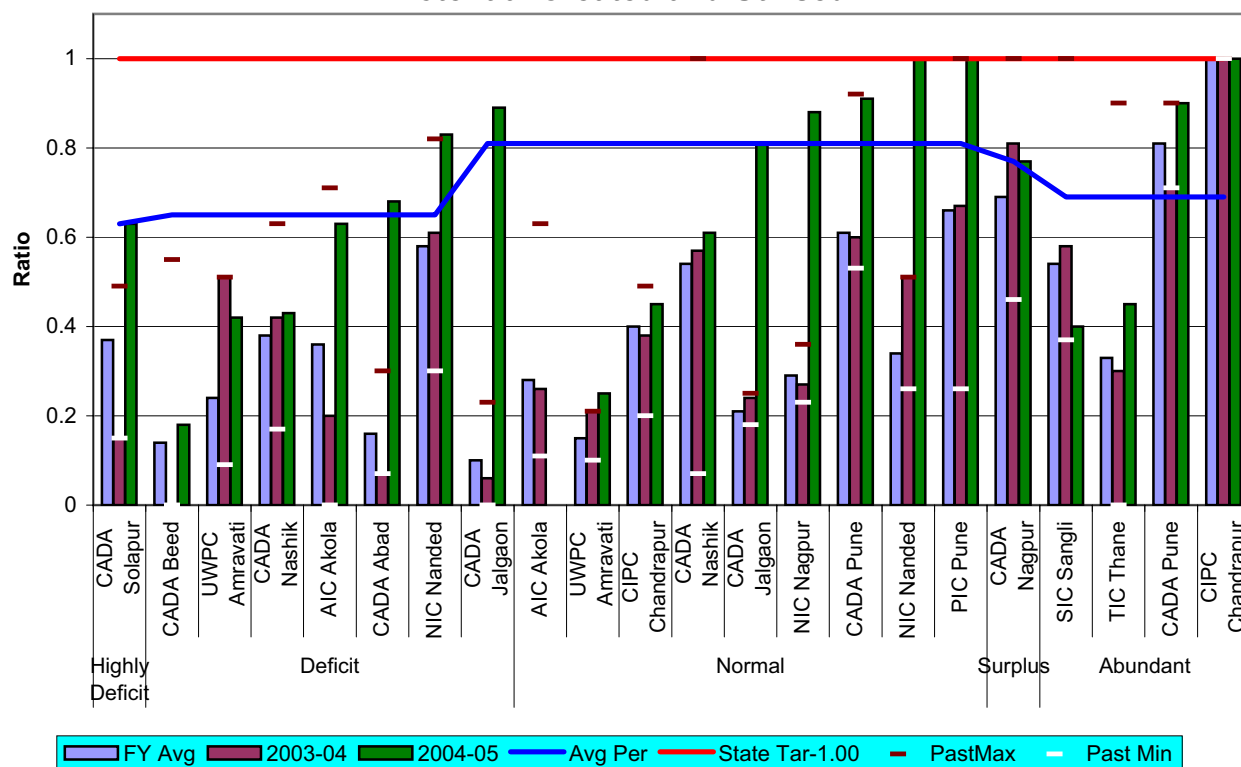
Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in blue are excluded from Avg Per. 3) 'No Water' indicates reservoirs are not filled in that year.



## **Indicator II: Potential Created and Utilised**

- 1) During 2003-04, water availability in Bhima project under CADA Solapur (highly deficit) was less (below sill level). There were restrictions on lift irrigation as water was reserved for drinking purpose. Hence the utilisation through lift was less. During 2004-05 reservoir was full and more area was brought under irrigation, improving the ratio, still it could not achieve the State target of 1.00.
- 2) The utilisation of potential in Majalgaon project under CADA Beed (deficit) is very less. Higher conveyance losses, as there was no driving head and scattered area under irrigation are the reasons for lesser utilisation.
- 3) In case of Wan project under UWPC Amravati (deficit), the potential utilisation during 2004-05 is low as compared to last year due to less water demand for irrigation. The management staff is required to exert more efforts for utilisation of water in future.
- 4) In Nalganga project under AIC Akola (deficit), the potential utilisation during 2004-05 is improved from 0.20 to 0.63.
- 5) In Jayakwadi project under CADA Aurangabad (deficit), the utilisation has considerably increased from 0.07 to 0.68 as the reservoir was almost full. However, it could not achieve the State target for the reasons stated in Indicator-I for this circle.
- 6) In Upper Wardha project under UWPC Amravati (normal) and Lower Wunna (NIC Nagpur-normal), the potential utilisation is increased as compared to their past performance.
- 7) In Hatnur project under CADA Jalgaon (normal) the utilisation is 81 percent of created potential during 2004-05 against 24 percent in 2003-04. The improvement in performance is due to accounting of additional irrigated area through water audit.
- 8) The projects under PIC Pune and NIC Nanded (normal) improved their performance achieving the State target of 1.00.
- 9) There is 100 percent potential utilisation on Asolamendha & Dina projects under CIPC Chandrapur (abundant) persistently as these are Kharif dominated projects. Moreover these are old projects and the irrigation system is well settled.

## Indicator II Major Projects Potential Created and Utilised



Plangroup	Circle	FY Avg	2003-04	2004-05	PastMax	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	0.37	0.15	0.63	0.49	0.15	0.63	F
Deficit	CADA Beed	0.14	No Irr	0.18	0.55	0.12	0.65	BA
	UWPC Amravati	0.24	0.51	0.42	0.51	0.09		BA
	CADA Nashik	0.38	0.42	0.43	0.63	0.17		BA
	AIC Akola	0.36	0.20	0.63	0.71	0.13		F
	CADA Abad	0.16	0.07	0.68	0.30	0.07		F
	NIC Nanded	0.58	0.61	0.83	0.82	0.30		M
	CADA Jalgaon	0.10	0.06	0.89	0.23	0.14		G
Normal	AIC Akola	0.28	0.26	No Irr	0.63	0.11	0.81	--
	UWPC Amravati	0.15	0.21	0.25	0.21	0.10		BA
	CIPC Chandrapur	0.40	0.38	0.45	0.49	0.20		BA
	CADA Nashik	0.54	0.57	0.61	1.00	0.07		F
	CADA Jalgaon	0.21	0.24	0.81	0.25	0.18		M
	NIC Nagpur	0.29	0.27	0.88	0.36	0.23		G
	CADA Pune	0.61	0.60	0.91	0.92	0.53		G
	NIC Nanded	0.34	0.51	1.00	0.51	0.26		VG
	PIC Pune	0.66	0.67	1.00	1.00	0.26		VG
Surplus	CADA Nagpur	0.69	0.81	0.77	1.00	0.46	0.77	M
Abundant	SIC Sangli	0.54	0.58	0.40	1.00	0.37	0.69	BA
	TIC Thane	0.33	0.30	0.45	0.90	0.18		BA
	CADA Pune	0.81	0.71	0.90	0.90	0.71		G
	CIPC Chandrapur	1.00	1.00	1.00	1.00	1.00		VG

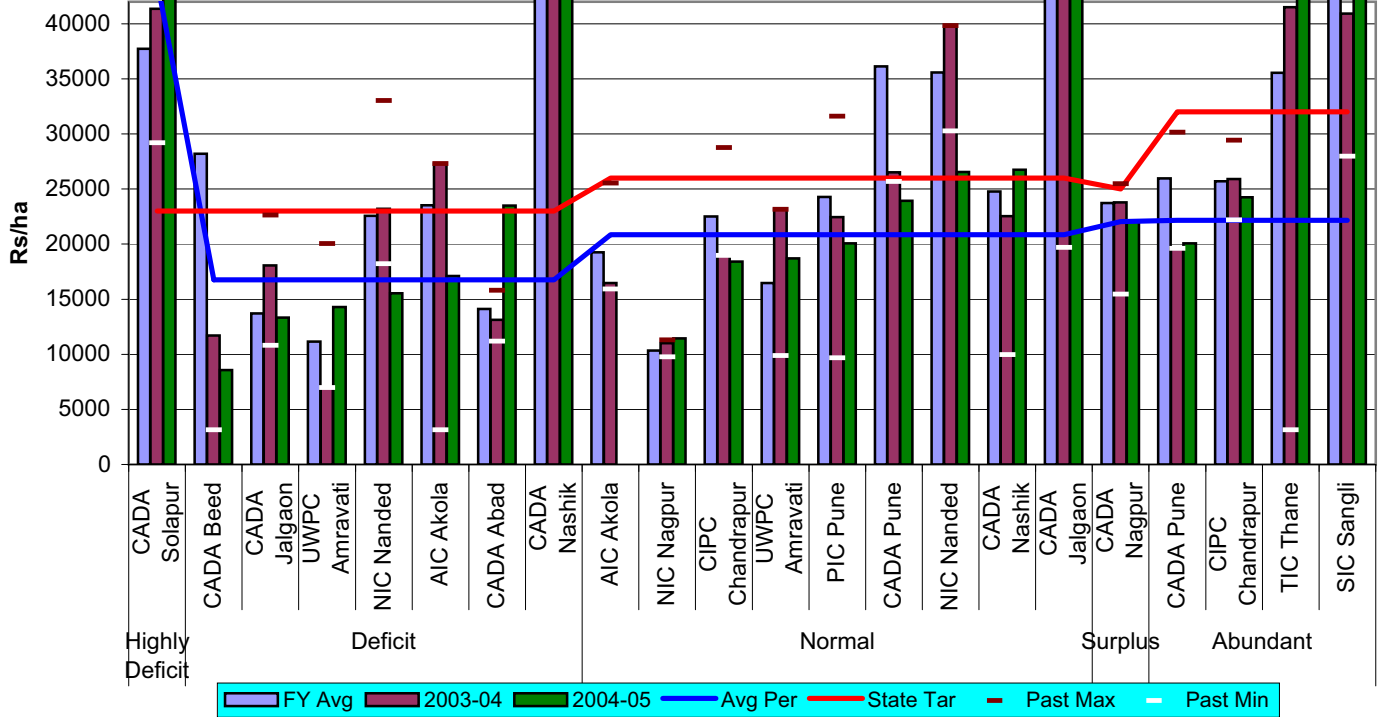
Notes: 1) Figures in blue are excluded from Avg Per.

2) 'No Irr' indicates the utilised potential in that year is nil.

### **Indicator III : Output per unit Irrigated Area**

- 1) The output per unit irrigated area in projects under CADA Beed (deficit) is reduced from Rs. 11706 to Rs. 8580. The probable reason for this is reduction in perennial cash crops due to non availability of water for the last three years.
- 2) In case of Girna project under CADA Jalgaon (deficit), it is reduced from Rs.18059/ha in 2003-04 to Rs. 13334/ha in 2004-05 due to reduction in area under cash crops from 75 percent to 55 percent.
- 3) In Wan project under UWPC Amravati (deficit), it appears to be increased as compared to its past performance. This may be due increased area irrigated through protective irrigation.
- 4) The output in projects under NIC Nanded (deficit) is reduced from Rs. 23200 to Rs. 15545 as the area under groundnut was considerably reduced in Manar project. In Vishnupuri project also only three rotations could be given in Rabi season.
- 5) The ratio in Nalganga project under AIC Akola (deficit) has rolled down during the year 2004-05 as compared to its past performance. As per the field officers information, cash crops like sugarcane, sunflower were not sown in 2004-05 due to less availability of water.
- 6) In Jayakwadi project under CADA A'bad (deficit), the output per ha is increased from Rs. 13126 to Rs. 23504, the reason being more area under hot weather groundnut.
- 7) Lower Wunna project in NIC Nagpur (normal) has very low output (Rs. 11445/ha) compared to State target due to less sowing of cash crops in the command.
- 8) The output in Bor project in CIPC Chandrapur (normal) is more or less same during 2003-04 & 2004-05. The difference in State target and project's achievement is attributed to low percentage of cash crops grown.
- 9) Increased area under Orange and Cotton has resulted in increase in output of Upper Wardha project under UWPC Amravati (normal) as compared to its FY Avg.
- 10) In CADA Pune (normal), the reduction in output is mainly due to white woolly aphids on sugarcane which spread over extensively in the command. Similarly, in Ghod project, water could not be provided at the maturity stage of crops, thereby affecting the yield.
- 11) In Upper Penganga Project under NIC Nanded (normal), the output is dropped as only protective irrigation could be given and maximum irrigation was in Rabi season due to lesser availability of water.
- 12) The ratio in Hatnur project under CADA Jalgaon (normal) is reduced from Rs. 79686/ha to Rs.72332/ha due to reduction in area under Banana from 3838 ha to 3389 ha.
- 13) The projects under CADA Nagpur (surplus) have output closer to the State target (Rs. 22058/ha)
- 14) Output of Dina & Asolamendha projects under CIPC Chandrapur (abundant) which are mainly paddy growing projects have comparable output of Rs. 24261/ha. Its output is bound to be low as compared to other projects under the plan group having high area under cash crops.

**Indicator III  
Major Projects  
Output per unit Irrigated Area (Rs/ha)**

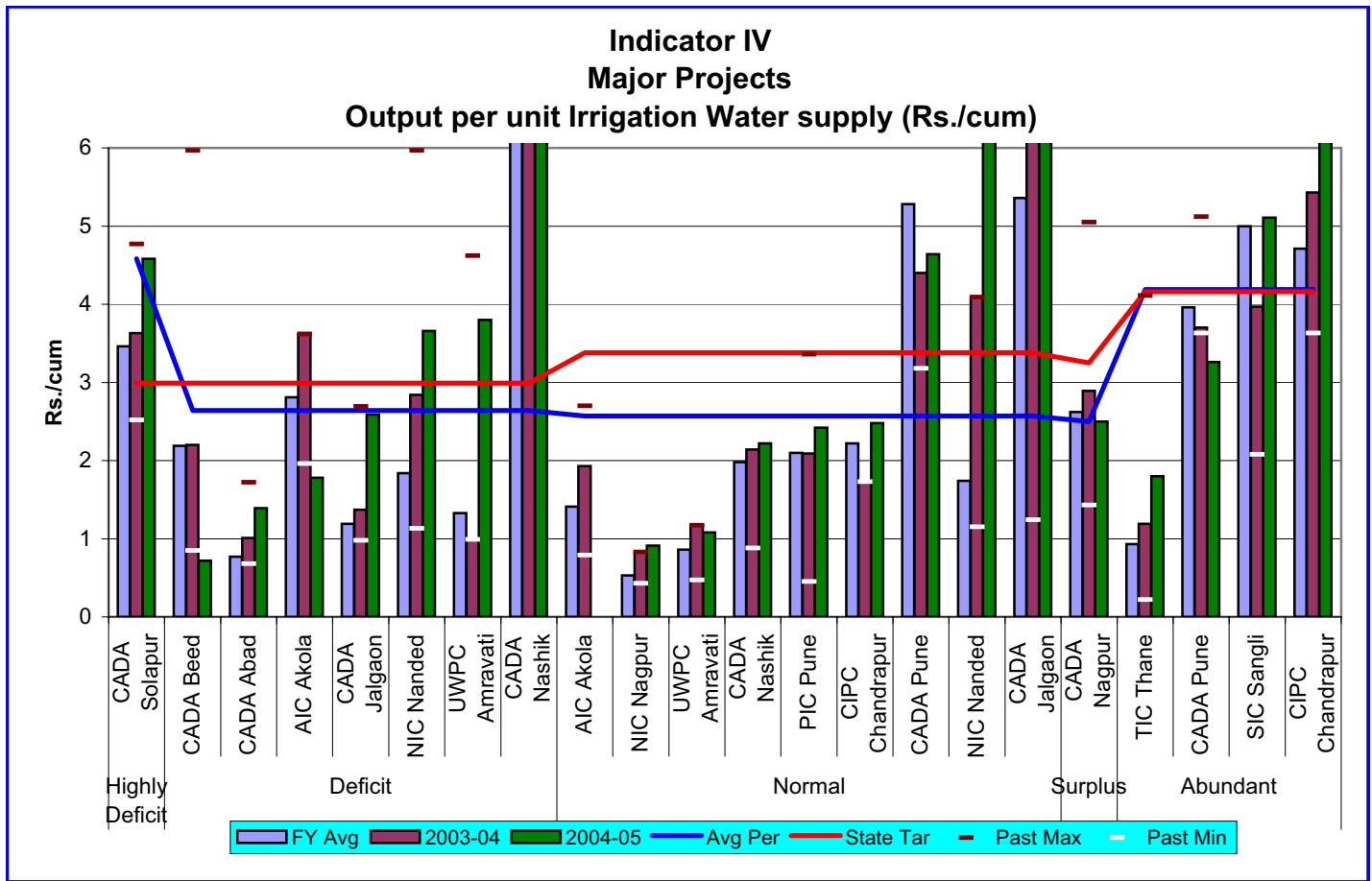


Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	St.Tar	Rank
Highly Deficit	CADA Solapur	37744	41367	43837	45432	29203	43837	21000	VG
Deficit	CADA Beed	28189	11706	8580	53030	3125	16756	23000	BA
	CADA Jalgaon	13717	18059	13334	22616	10806			F
	UWPC Amravati	11150	6979	14286	20029	6979			F
	NIC Nanded	22555	23200	15545	33023	18199			F
	AIC Akola	23534	27290	17113	27290	3125			M
	CADA Abad	14121	13126	23504	15813	11186			VG
	CADA Nashik	54217	54857	43133	58043	46842			VG
Normal	AIC Akola	19265	16458	No Irr	25524	15916	20841	26000	--
	NIC Nagpur	10340	11001	11445	11292	9772			BA
	CIPC Chandrapur	22515	18957	18421	28752	18957			M
	UWPC Amravati	16466	23149	18719	23149	9886			M
	PIC Pune	24271	22452	20062	31589	9660			M
	CADA Pune	36133	26528	23941	50853	25685			G
	NIC Nanded	35569	39808	26542	39808	30263			VG
	CADA Nashik	24766	22548	26755	126149	9969			VG
CADA Jalgaon	79218	79686	72332	148519	19680	VG			
Surplus	CADA Nagpur	23730	23796	22058	25463	15463	22058	25000	G
Abundant	CADA Pune	25957	19599	20076	30159	19599	22169	32000	F
	CIPC Chandrapur	25692	25904	24261	29413	22187			M
	TIC Thane	35554	41514	44567	47180	3125			VG
	SIC Sangli	51172	40936	51680	63025	27969			VG

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in blue and red excluded from Avg Per. 3) 'No Irr' indicates utilised potential in that year is nil.

**Indicator IV : Output Per Unit Irrigation Water Supply**

- 1) In CADA Solapur (highly deficit), the ratio increased from Rs. 3.63/cum to Rs. 4.58/cum as the water is used efficiently compared to 2003-04 and FY average.
- 2) In case of Nalganga project (AIC Akola-deficit), low performance for the year 2004-05 can be attributed to relatively low percentage of cash crops grown in the command area for the reasons mentioned in preceding paragraphs.
- 3) Output per unit water supply in Girna project under CADA Jalgaon (deficit) has almost doubled over last years value as protective irrigation was given.
- 4) The ratio in CADA Nashik (deficit) is reduced from Rs. 15.30/cum to Rs. 10.89/cum. This is mainly due to reduction in output in Chankapur project.
- 5) The output in Upper Wardha project under UWPC Amravati (normal) is quite low (Rs. 1.08/m<sup>3</sup>) as compared to State target (Rs. 3.38/m<sup>3</sup>). This is mainly due to low water use efficiency experienced on the project. Output could be increased by economical use of water on the project.
- 6) Output in Bor project under CIPC Chandrapur (normal) is increased as compared to its past performance. The increase is due to improvement in WUE from 91 to 134 ha/Mcum.
- 7) Output/m<sup>3</sup> of irrigation water supply on projects under CADA Nagpur (surplus) could be increased by lowering down the water use per unit area irrigated, particularly on Pench & Itiadh projects.
- 8) As Asolamendha and Dina projects under CIPC Chandrapur (abundant) have very low irrigation water use per unit area irrigated, its output (Rs. 6.27/m<sup>3</sup>) is exceptionally high.

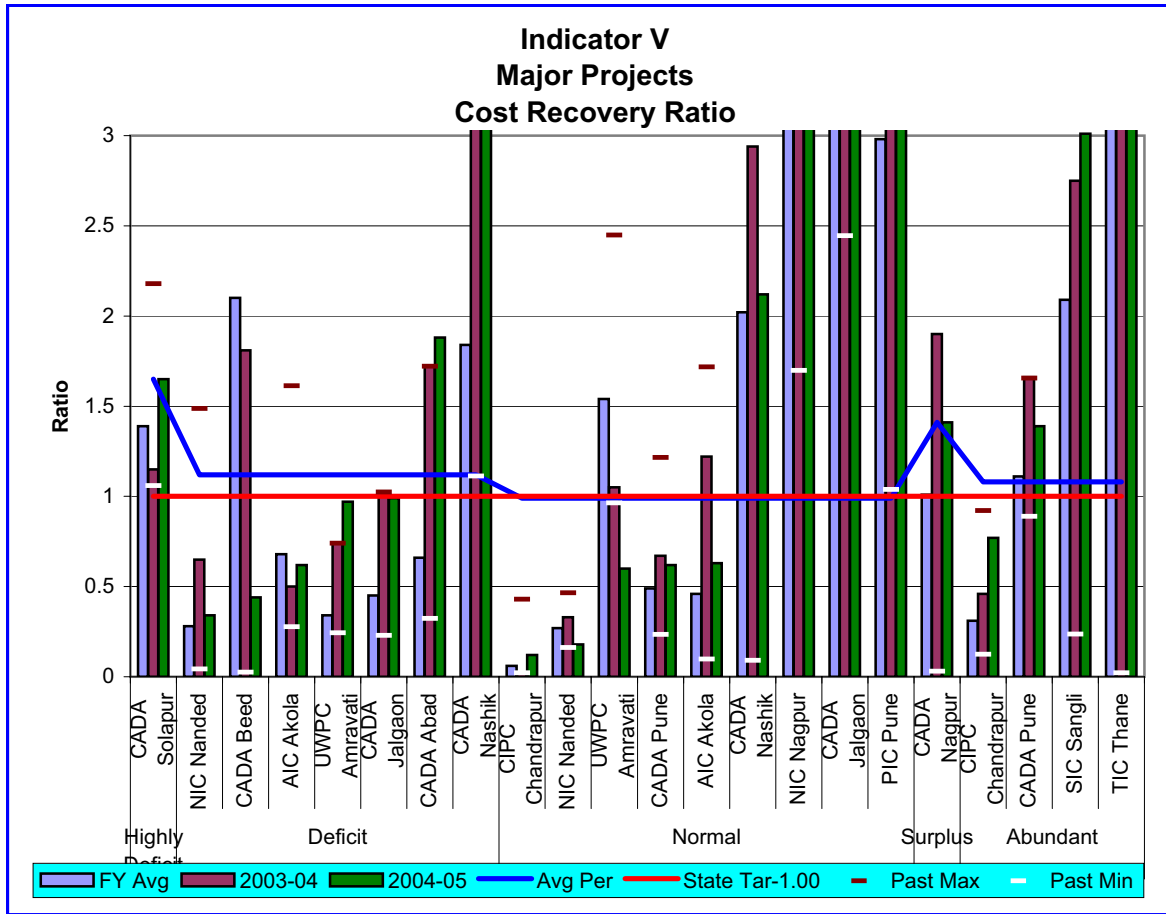


Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	St Tar	Rank
Highly Deficit	CADA Solapur	3.46	3.63	4.58	4.77	2.52	4.58	2.69	VG
Deficit	CADA Beed	2.19	2.20	0.72	5.97	0.85			BA
	CADA Abad	0.77	1.01	1.39	1.72	0.68			BA
	AIC Akola	2.81	3.62	1.78	3.62	1.96			F
	CADA Jalgaon	1.19	1.37	2.59	2.69	0.98	2.64	2.99	G
	NIC Nanded	1.84	2.84	3.66	5.97	1.13			VG
	UWPC Amravati	1.33	0.99	3.80	4.62	0.99			VG
	CADA Nashik	13.90	15.30	10.89	16.53	10.53			VG
Normal	AIC Akola	1.41	1.93	No Water	2.70	0.79			--
	NIC Nagpur	0.53	0.83	0.91	0.83	0.43			BA
	UWPC Amravati	0.86	1.17	1.08	1.17	0.47			BA
	CADA Nashik	1.98	2.14	2.22	11.91	0.88			F
	PIC Pune	2.10	2.09	2.42	3.36	0.45	2.57	3.38	M
	CIPC Chandrapur	2.22	1.73	2.48	7.10	1.73			M
	CADA Pune	5.28	4.40	4.64	6.67	3.18			VG
	NIC Nanded	1.74	4.09	6.76	4.09	1.15			VG
	CADA Jalgaon	5.36	11.07	8.70	19.09	1.24			VG
Surplus	CADA Nagpur	2.62	2.89	2.50	5.05	1.43	2.50	3.25	M
Abundant	TIC Thane	0.93	1.19	1.80	4.11	0.22	4.19	4.16	BA
	CADA Pune	3.96	3.70	3.26	5.12	3.63			M
	SIC Sangli	5.00	3.97	5.11	6.61	2.08			VG
	CIPC Chandrapur	4.71	5.43	6.27	7.12	3.63			VG

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in blue & red are excluded from Avg Per  
3) 'No Water' indicates reservoirs are not filled in that year.

## **Indicator V : Cost Recovery Ratio**

- 1) In Purna project under NIC Nanded (deficit) recovery of water charges for irrigation and non irrigation uses is reduced from Rs. 124 lakh to Rs. 22 lakh and Rs. 127 lakh to Rs. 73 lakh respectively. Similarly, the O&M cost in Vishnupuri project increased from Rs. 93 lakh to Rs. 144 lakh, reducing the Cost Recovery Ratio to nearly half of the last year's value.
- 2) Increase in O&M expenditure due to carrying out deferred maintenance works in Manjra project under CADA Beed (deficit) has reduced the ratio to less than 1/3<sup>rd</sup> of previous year's value. Moreover, there was no water supply for thermal power station at Parli during 2004-05 reducing the recovery of circle as a whole.
- 3) Ratio in case of Nalganga (AIC Akola-deficit), Bor (CIPC Chandrapur-normal), Asolamendha and Dina (CIPC Chandrapur-abundant) is less than target. However all the projects have improved their performance as compared to past.
- 4) In Upper Penganga Project under NIC Nanded (normal) the O&M cost increased from Rs. 534 lakh in 2003-04 to Rs. 752 lakh in 2004-05 due to increase in establishment expenditure and decrease in revenue by about Rs. 37 lakh resulted in decrease in the ratio.
- 5) The recovery in Khadakwasla, NRBC and Pavana increased over the last year by 29 percent, 43 percent and 82 percent respectively, whereas the O&M cost in NLBC and NRBC increased by 20 percent and 25 percent respectively. However, the overall effect was improvement in the ratio of circle (PIC Pune- normal) from 4.57 to 11.55.
- 6) Performance of group of projects under CADA Nagpur (surplus) is appreciable on account of realization of 96 percent non irrigation revenue recovery.
- 7) In projects under TIC Thane (abundant), the O&M cost particularly in Surya project has increased due to past liability. However, considerable increase in revenue in Bhatsa project could retain the performance to 'very good'.



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	1.39	1.15	1.65	2.18	1.06	1.65	VG
Deficit	NIC Nanded	0.28	0.65	0.34	1.49	0.04	1.12	BA
	CADA Beed	2.10	1.81	0.44	14.26	0.03		BA
	AIC Akola	0.68	0.50	0.62	1.61	0.28		F
	UWPC Amravati	0.34	0.74	0.97	0.74	0.24		G
	CADA Jalgaon	0.45	1.02	0.99	1.02	0.23		G
	CADA Abad	0.66	1.72	1.88	1.72	0.32		VG
	CADA Nashik	1.84	3.06	3.07	3.06	1.11		VG
	Normal	CIPC Chandrapur	0.06	0.02	0.12	0.43		0.02
NIC Nanded		0.27	0.33	0.18	0.47	0.16	BA	
UWPC Amravati		1.54	1.05	0.60	2.45	0.96	F	
CADA Pune		0.49	0.67	0.62	1.22	0.23	F	
AIC Akola		0.46	1.22	0.63	1.72	0.10	F	
CADA Nashik		2.02	2.94	2.12	67.62	0.09	VG	
NIC Nagpur		3.15	4.74	4.31	4.74	1.70	VG	
CADA Jalgaon		5.35	9.62	5.47	10.87	2.45	VG	
Surplus	PIC Pune	2.98	4.57	5.55	21.71	1.04	VG	
Surplus	CADA Nagpur	1.01	1.90	1.41	3.06	0.03	1.41	VG
Abundant	CIPC Chandrapur	0.31	0.46	0.77	0.92	0.13	1.08	M
	CADA Pune	1.11	1.66	1.39	1.66	0.89		VG
	SIC Sangli	2.09	2.75	3.01	8.51	0.24		VG
	TIC Thane	15.14	37.40	11.13	213.59	0.02		VG

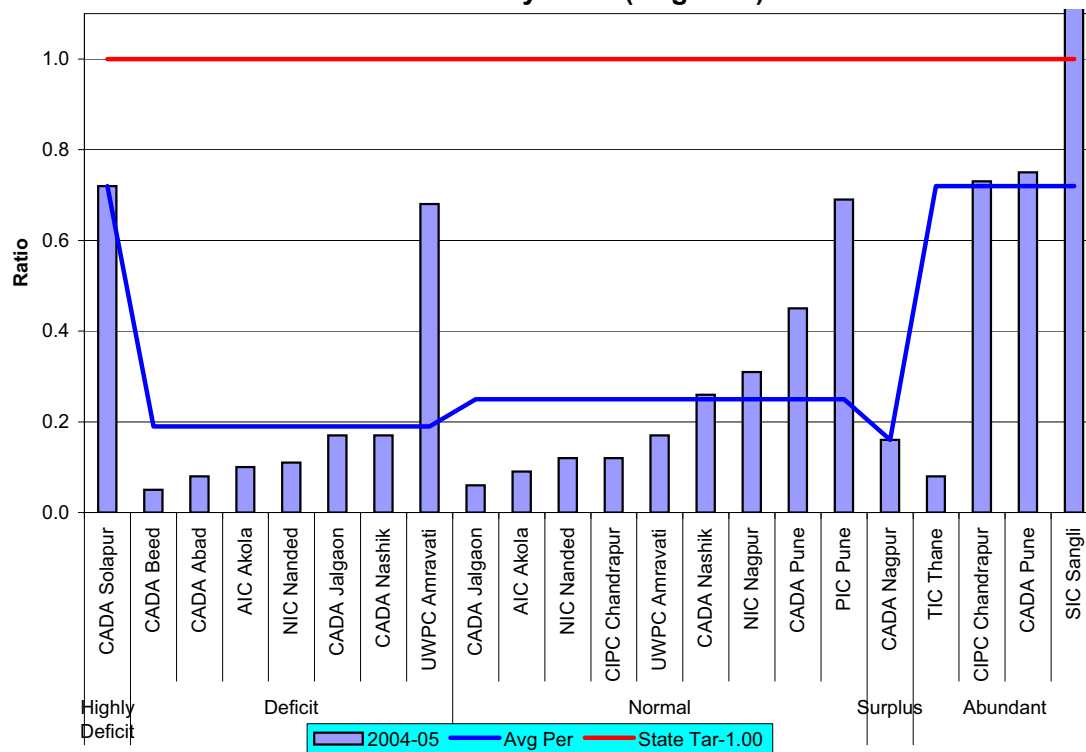
Note: Figures in red indicate values exceeding range of graph.



### **Indicator – V (I) : Cost Recovery Ratio (Irrigation)**

Out of 22 circles in various plangroups, only six circles have achieved more than or 50 percent of target value. Remaining 16 circles have performed below average. It can be concluded that efforts to recover the irrigation charges at various levels falls short of and more attention has to pay on this drive.

**Indicator V (I)  
Major Projects  
Cost Recovery Ratio (Irrigation)**

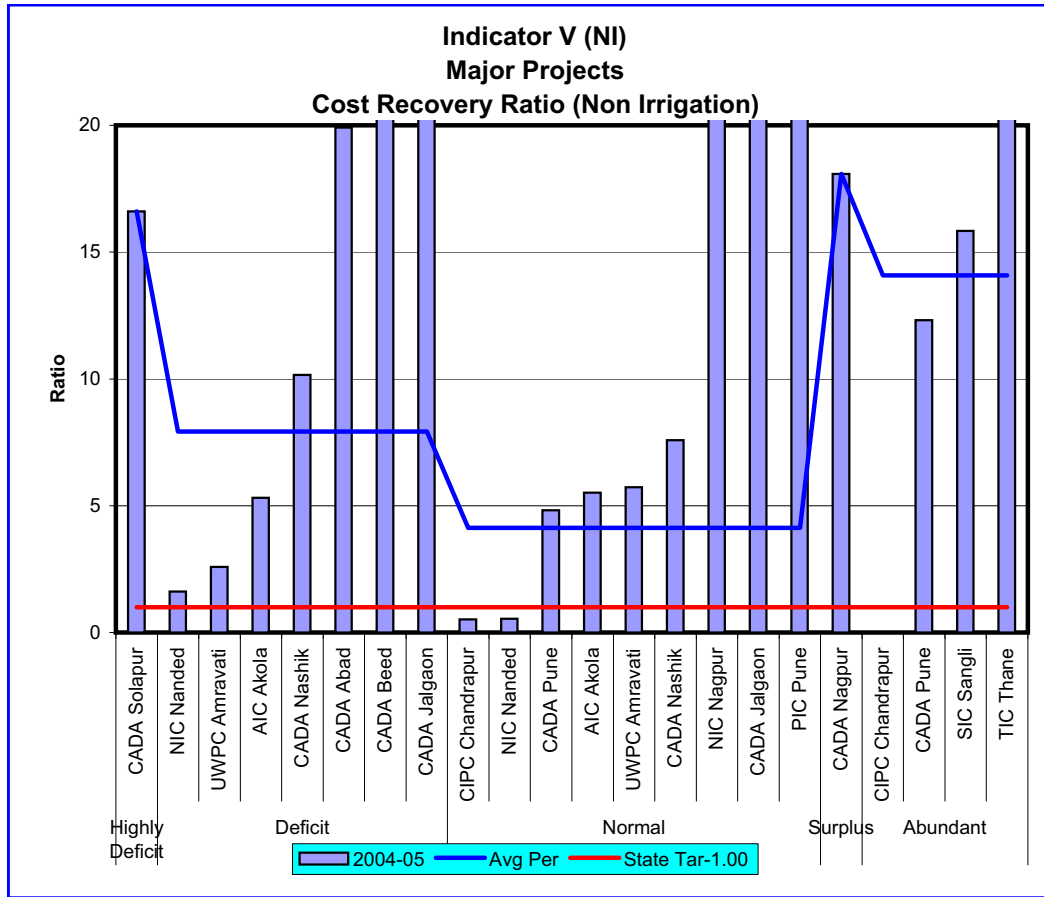


Plangroup	Circle	2004-05	Avg Per	State Tar-1	Rank
Highly Deficit	CADA Solapur	0.72	0.72	1.00	M
Deficit	CADA Beed	0.05	0.19	1.00	BA
	CADA Abad	0.08		1.00	BA
	AIC Akola	0.10		1.00	BA
	NIC Nanded	0.11		1.00	BA
	CADA Jalgaon	0.17		1.00	BA
	CADA Nashik	0.17		1.00	BA
	UWPC Amravati	0.68		1.00	F
Normal	CADA Jalgaon	0.06	0.25	1.00	BA
	AIC Akola	0.09		1.00	BA
	NIC Nanded	0.12		1.00	BA
	CIPC Chandrapur	0.12		1.00	BA
	UWPC Amravati	0.17		1.00	BA
	CADA Nashik	0.26		1.00	BA
	NIC Nagpur	0.31		1.00	BA
	CADA Pune	0.45		1.00	BA
	PIC Pune	0.69		1.00	F
Surplus	CADA Nagpur	0.16	0.16	1.00	BA
Abundant	TIC Thane	0.08	0.72	1.00	BA
	CIPC Chandrapur	0.73		1.00	M
	CADA Pune	0.75		1.00	M
	SIC Sangli	1.31		1.00	VG

Note: Figures in red indicate values exceeding range of graph.

**Indicator – V (NI) : Cost Recovery Ratio (Non-Irrigation)**

Except CIPC Chandrapur, (normal & abundant) and NIC Nanded (normal) all circles have crossed the State Target. It can be concluded that the recovery of non irrigation charges plays a vital role in deciding the ranking of circle, if recovery figures of irrigation & non irrigation are put together and evaluated combinely.

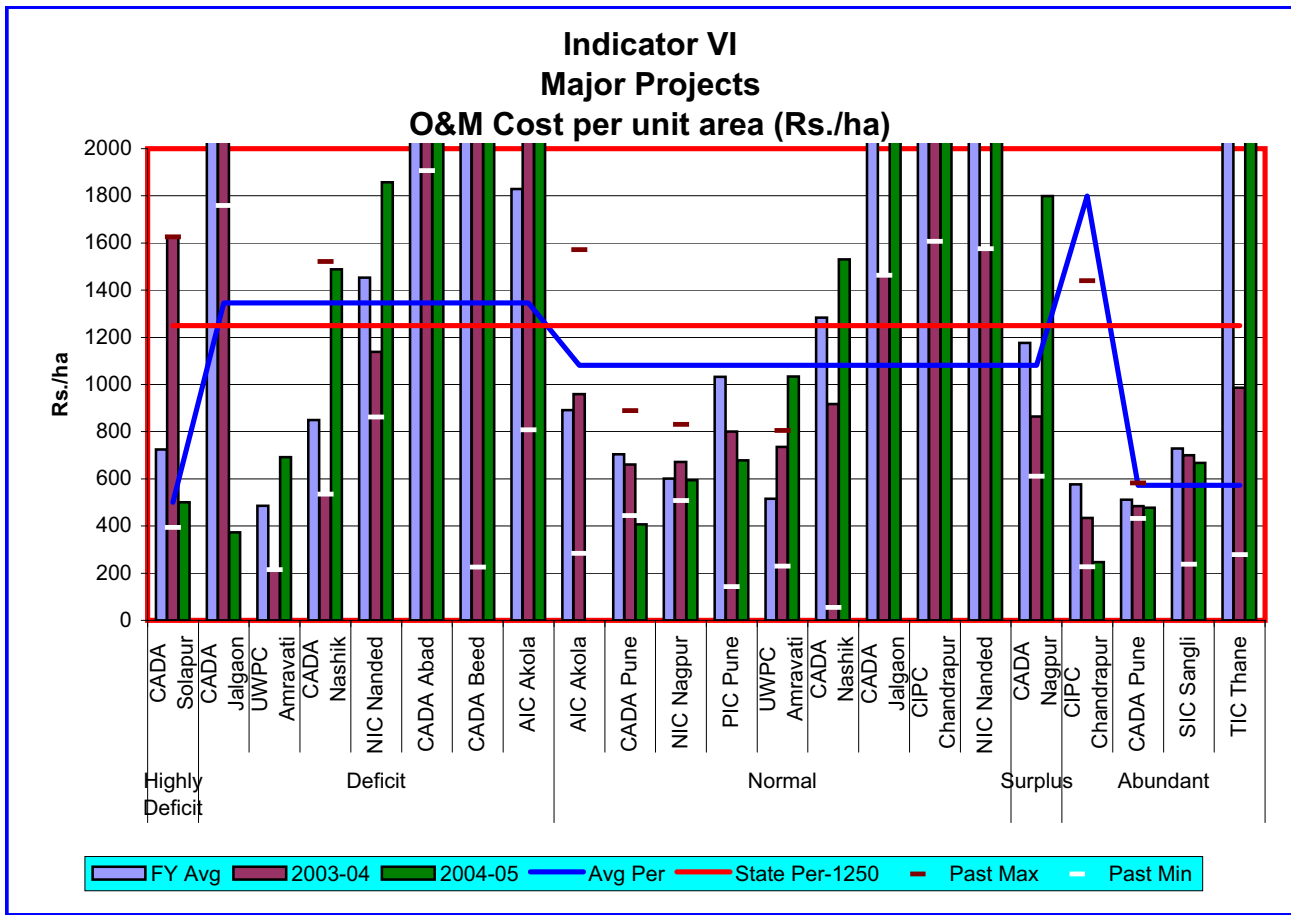


Plangroup	Circle	2004-05	Avg Per	State Tar-1	Rank
Highly Deficit	CADA Solapur	16.60	16.60	1.00	VG
Deficit	NIC Nanded	1.61	7.92	1.00	VG
	UWPC Amravati	2.59		1.00	VG
	AIC Akola	5.31		1.00	VG
	CADA Nashik	10.16		1.00	VG
	CADA Abad	19.91		1.00	VG
	CADA Beed	22.18		1.00	VG
	CADA Jalgaon	112.81		1.00	VG
Normal	CIPC Chandrapur	0.52	4.12	1.00	F
	NIC Nanded	0.54		1.00	F
	CADA Pune	4.82		1.00	VG
	AIC Akola	5.51		1.00	VG
	UWPC Amravati	5.73		1.00	VG
	CADA Nashik	7.58		1.00	VG
	NIC Nagpur	27.00		1.00	VG
	CADA Jalgaon	27.86		1.00	VG
	PIC Pune	151.09		1.00	VG
Surplus	CADA Nagpur	18.08	18.08	1.00	VG
Abundant	CIPC Chandrapur	0.00	14.08	1.00	BA
	CADA Pune	12.31		1.00	VG
	SIC Sangli	15.84		1.00	VG
	TIC Thane	38.64		1.00	VG

Note: Figures in red indicate values exceeding range of graph.

**Indicator VI: O&M Cost per unit Area**

- 1) In case of Bhima project under CADA Solapur (highly deficit), O&M cost per unit area was Rs.1625 in 2003-04 as 32901 ha irrigation was done through lift from dead storage. During 2004-05, the cost per ha has come down to Rs. 501 as a result of flow and lift irrigation over an area of 134516 ha.
- 2) O&M cost per unit area in CADA Jalgaon (deficit) is reduced considerably due to increased area (10 times) under irrigation during 2004-05 in Girna project.
- 3) The ratio during 2004-05 in Katepurna & Nalganga under AIC Akola (deficit) is exceptionally high (9957/ha). Due to scarcity condition, there was no irrigation on Katepurna project which has lead to increase in O & M cost/ha.
- 4) Lower Wunna (NIC Nagpur-normal), Dina & Asolamendha (CIPC Chandrapur-abundant) have appreciably low ratio as compared to State target.
- 5) The cost per unit area in case of CADA Nashik (deficit) increased due to reduction in area irrigated by about 37 percent. However, the reduction in cost is only 25 percent.
- 6) In Jayakwadi project under CADA Aurangabad (deficit), availability of water was 98 percent. O & M cost is marginally increased but area irrigated is increased by about 4.5 times, thereby bringing the ratio considerably below past value. Still there is scope for improvement.
- 7) In Majalgaon project under CADA Beed (deficit) there was sizeable reduction in O&M cost from Rs. 66 lakh to Rs. 22 lakh and at the same time, area under irrigation increased nearly 10 times reducing the O&M cost per unit area considerably.
- 8) Lower Wunna project under NIC Nagpur (normal) has succeeded in lowering the cost as compared to its past performance.
- 9) O&M cost per unit area in case of PIC Pune (normal) is reduced from Rs.800/ha to Rs. 679/ha, as a result of reduction in O&M cost in Khadakwasla and Pawana projects, compared to the year 2003-04.
- 10) The cost per unit area in projects under CADA Nashik (normal), increased from Rs. 917/ha to Rs. 1531/ha, due to increase in expenditure by making payment of pending bills of previous years in Bhandardara & Darna projects. Particularly in Bhandardara project increase in expenditure is 8.5 times.
- 11) In case of Bor project under CIPC Chandrapur (normal) & group of projects under CADA Nagpur (surplus), the ratio is more than State target. Low reservoir filling, leading to reduction in irrigated area is the cause for exceeding the target value.
- 12) In projects under TIC Thane (abundant), the O&M cost increased considerably over 2003-04. The increase in area is not proportionate with O&M cost. therefore, the ratio has increased from Rs. 986 / ha to Rs. 5215 / ha.



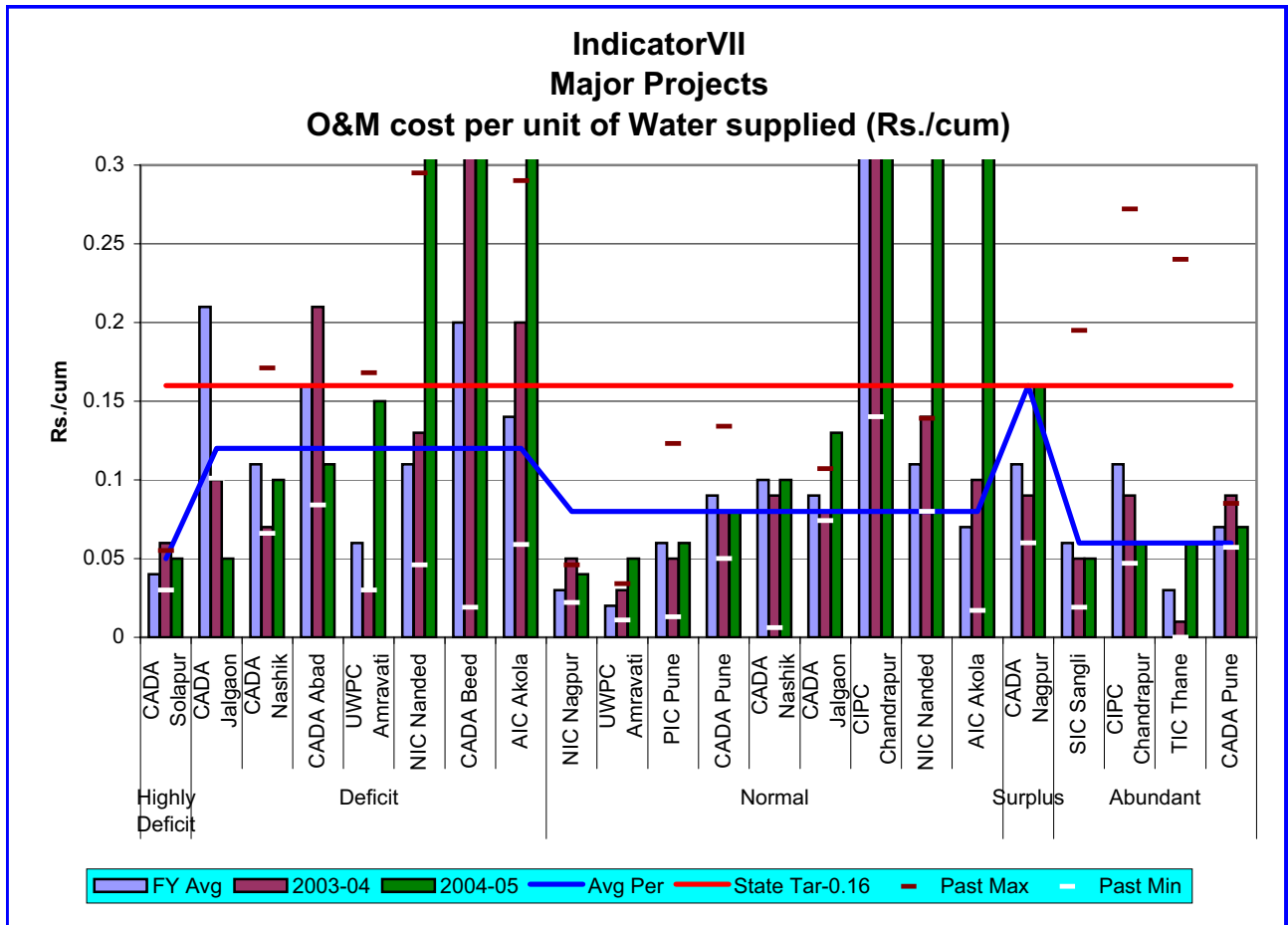
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	724	1625	501	1625	393	501	BA
Deficit	CADA Jalgaon	4478	3515	373	230435	1758	1346	BA
	UWPC Amravati	486	214	692	2097	214		F
	CADA Nashik	850	534	1488	1521	534		BA
	NIC Nanded	1453	1139	1857	5572	861		BA
	CADA Abad	3574	7865	2224	7865	1907		BA
	CADA Beed	3341	114081	6407	65067	225		BA
	AIC Akola	1829	2758	9957	5007	807		BA
Normal	AIC Akola	892	959	No Irr	1571	284	1081	--
	CADA Pune	704	661	407	889	444		BA
	NIC Nagpur	601	672	594	831	508		BA
	PIC Pune	1032	800	679	4331	143		F
	UWPC Amravati	515	736	1034	805	229		M
	CADA Nashik	1284	917	1531	21365	54		BA
	CADA Jalgaon	2561	1463	2942	3338	1463		BA
	CIPC Chandrapur	7310	15681	3688	15681	1606		BA
NIC Nanded	2305	1575	6877	3637	1575	BA		
Surplus	CADA Nagpur	1176	864	1799	2387	610	1799	BA
Abundant	CIPC Chandrapur	577	434	247	1439	227	573	BA
	CADA Pune	511	485	477	582	432		BA
	SIC Sangli	728	700	668	2412	238		F
	TIC Thane	2826	986	5215	15439	278		BA

Note: 1) Figures in red indicate values exceeding range of graph.

2) Figures in blue are excluded for Avg Per. 3) 'No Irr' indicates utilised potential of that year is nil.

### **Indicator VII : O&M Cost per unit Water Supplied**

- 1) As the area irrigated on lifts in Bhima project under CADA Solapur (highly deficit) is substantial, the O&M cost per unit water supply is very low persistently.
- 2) The O&M cost in Purna project under NIC Nanded (deficit) is more or less constant over last two years whereas the annual water supply for irrigation is reduced from 353.3 to 31.1 Mcum., The increase in O&M cost per unit of water supply is due to non availability of water.
- 3) The ratio in projects under CADA Beed (deficit) decreased from Rs. 1.67 in 2003-04 to 0.40 in 2004-05, the reason being sizeable increase in water use in two (Majalgaon and Jayakwadi PRBC) out of four projects.
- 4) The ratio during 2004-05 in case of Nalganga project (AIC Akola-deficit) & Bor CIPC Chandrapur (normal) is more than State target, due to lesser availability of water for irrigation.
- 5) The performance of Lower Wunna project (NIC Nagpur-normal), Upper Wardha project (UWPC Amravati-normal) & projects under CIPC Chandrapur (abundant) is low, compared to the State target.
- 6) The O&M cost in Upper Penganga Project under NIC Nanded (normal) has increased by 40 percent and at the same time water use has decreased by 86 percent, due to lesser availability of water resulting in rise in the cost per cum from Rs.0.14 to Rs. 0.62.
- 7) The ratio is quite low in TIC Thane (abundant), as domestic and industrial water supply to Mumbai and sub urban area is from projects under this circle.



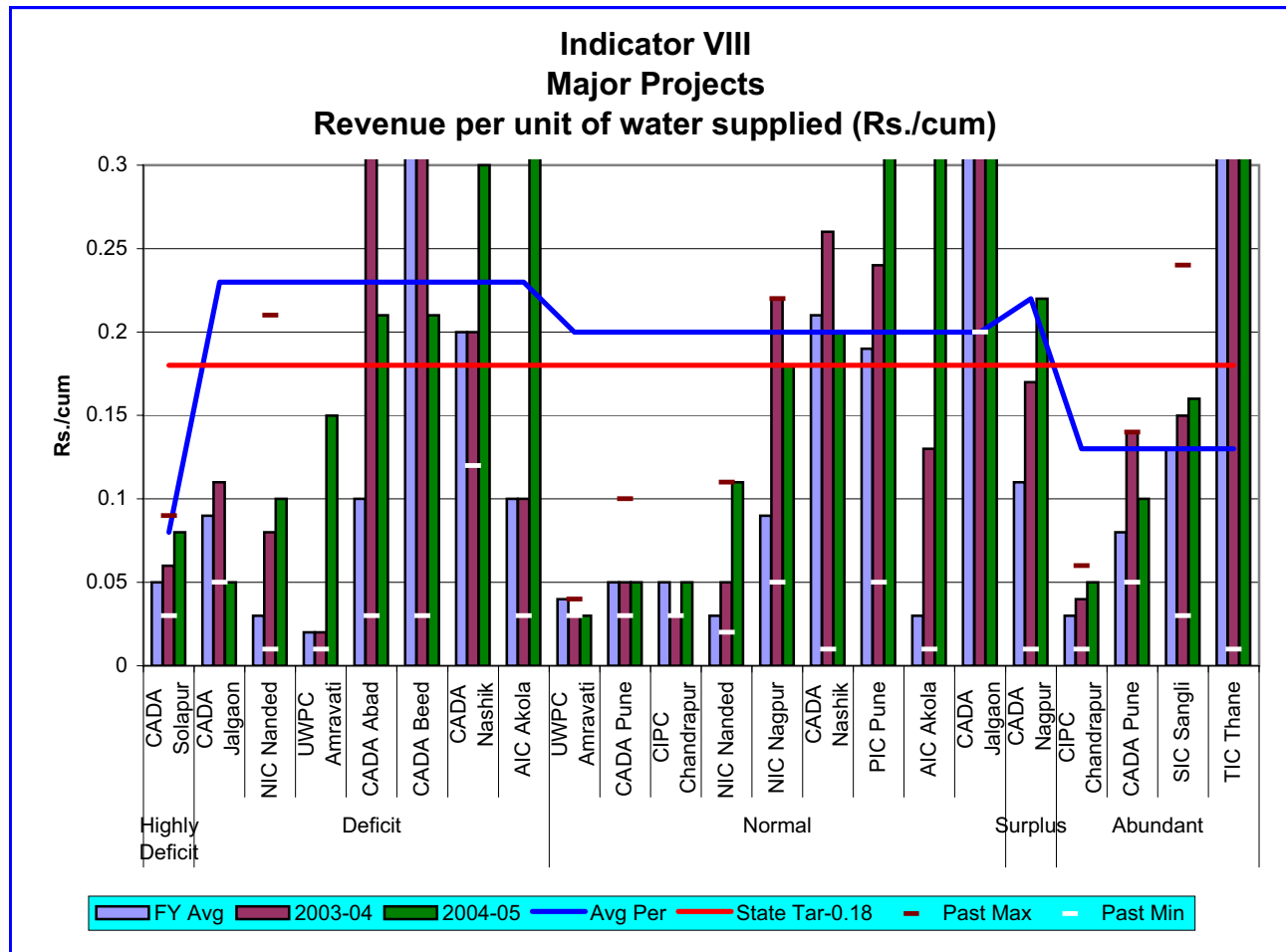
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	0.04	0.06	0.05	0.06	0.03	0.05	BA
Deficit	CADA Jalgaon	0.21	0.10	0.05	0.89	0.10	0.12	BA
	CADA Nashik	0.11	0.07	0.10	0.17	0.07		F
	CADA Abad	0.16	0.21	0.11	0.48	0.08		F
	UWPC Amravati	0.06	0.03	0.15	0.17	0.03		M
	NIC Nanded	0.11	0.13	0.31	0.30	0.05		BA
	CADA Beed	0.20	1.67	0.40	1.86	0.02		BA
	AIC Akola	0.14	0.20	0.67	0.29	0.06		BA
	AIC Akola	0.14	0.20	0.67	0.29	0.06		BA
Normal	NIC Nagpur	0.03	0.05	0.04	0.05	0.02	0.08	BA
	UWPC Amravati	0.02	0.03	0.05	0.03	0.01		BA
	PIC Pune	0.06	0.05	0.06	0.12	0.01		BA
	CADA Pune	0.09	0.08	0.08	0.13	0.05		BA
	CADA Nashik	0.10	0.09	0.10	0.89	0.01		F
	CADA Jalgaon	0.09	0.08	0.13	0.11	0.07		M
	CIPC Chandrapur	0.71	1.43	0.43	1.58	0.14		BA
	NIC Nanded	0.11	0.14	0.62	0.14	0.08		BA
	AIC Akola	0.07	0.10	1.05	0.63	0.02		BA
Surplus	CADA Nagpur	0.11	0.09	0.16	0.30	0.06	0.16	G
Abundant	SIC Sangli	0.06	0.05	0.05	0.20	0.02	0.06	BA
	CIPC Chandrapur	0.11	0.09	0.06	0.27	0.05		BA
	TIC Thane	0.03	0.01	0.06	0.24	0.00		BA
	CADA Pune	0.07	0.09	0.07	0.09	0.06		BA

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in blue excluded for Avg Per



### **Indicator VIII : Revenue per unit Water Supplied**

- 1) The ratio has increased from Rs. 0.06/cum in 2003-04 to Rs. 0.08/cum in 2004-05 in CADA Solapur (highly deficit) due to special drive taken for recovery. There is an enhancement in recovery from Rs. 614 lakh in 2003-04 to Rs. 1112 lakh in 2004-05.
- 2) The total utilisation of water in respect of Girna project under CADA Jalgaon (deficit) is increased by 2.78 times. In spite of increase in annual revenue collection by 1.28 times over the last year, the ratio is lowered from 0.11 to 0.05 due to increased water utilisation in 2004-05.
- 3) Revenue per unit water supplied in CADA Nashik (deficit) increased from Rs. 0.2/cum to Rs.0.3/cum. This is mainly due to reduction in water use by 60 percent. At the same time the revenue is reduced by 48 percent.
- 4) Revenue realization per unit of total water supplied is appreciable, in case of Katepurna & Nalganga (AIC Akola-deficit), compared to the State target. The performance is better due to 80 to 100 percent realization of revenue for non-irrigation water supply. However, revenue realization in case of Nalganga has rolled down to Rs. 0.11/cum during 2004-05. ( In case of Nalganga project, revenue recovery per unit irrigation water supply is Rs. 0.07 /m<sup>3</sup> only).
- 5) Low irrigation revenue recovery against assessment, has affected the performance of Upper Wardha in UWPC Amravati (normal) & projects under CIPC Chandrapur (abundant).
- 6) Upper Penganga Project under NIC Nanded (normal) has improved the ratio from Rs. 0.05 per cum to Rs. 0.11 per cum, elevating the performance from below average to fair.
- 7) The performance of CADA Nagpur (surplus), in respect of total revenue per unit water supplied, is improved over five years as well as last year & has crossed the State target. Improvement is due to 96 percent NI recovery on Pench project contributing a major share in total revenue, amongst the three projects under CADA Nagpur, as the irrigation recovery ratio on Pench, Bagh & Itiadoh projects is Rs. 0.02/m<sup>3</sup>.
- 8) In case of TIC Thane (abundant) it has increased from Rs. 0.43/cum in 2003-04 to Rs. 0.70/cum in 2004-05. The reason being no recovery during 2003-04 and recovery of Rs. 2330 lakh in Bhatsa Project during 2004-05 and increase in revenue from Rs. 2214 lakh in 2003-04 to Rs. 2610 lakh in 2004-05 in Kal project.

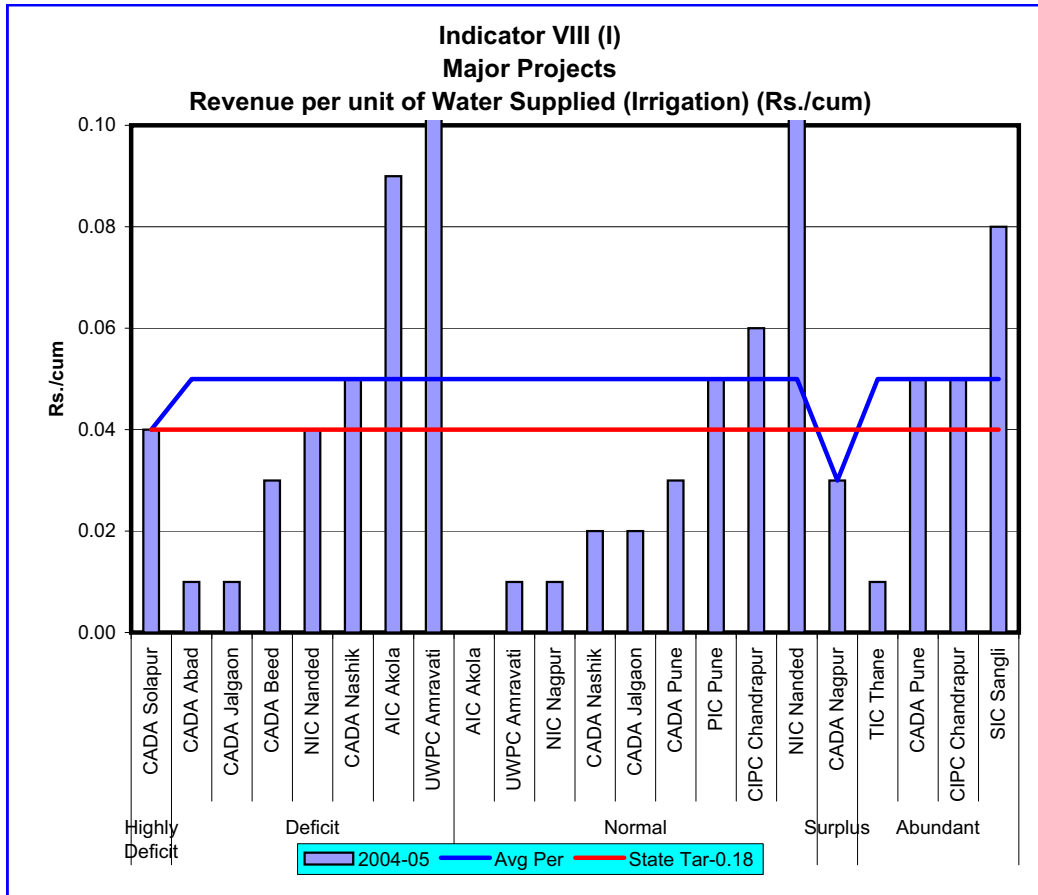


Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	0.05	0.06	0.08	0.09	0.03	0.08	BA
Deficit	CADA Jalgaon	0.09	0.11	0.05	0.33	0.05	0.23	BA
	NIC Nanded	0.03	0.08	0.10	0.21	0.01		F
	UWPC Amravati	0.02	0.02	0.15	0.55	0.01		M
	CADA Abad	0.10	0.36	0.21	0.36	0.03		VG
	CADA Beed	0.42	3.02	0.21	17.65	0.03		VG
	CADA Nashik	0.20	0.20	0.30	0.31	0.12		VG
	AIC Akola	0.10	0.10	0.42	1.18	0.03		VG
	Normal	UWPC Amravati	0.04	0.03	0.03	0.04		0.03
CADA Pune		0.05	0.05	0.05	0.10	0.03	BA	
CIPC Chandrapur		0.05	0.03	0.05	0.33	0.03	BA	
NIC Nanded		0.03	0.05	0.11	0.11	0.02	F	
NIC Nagpur		0.09	0.22	0.18	0.22	0.05	VG	
CADA Nashik		0.21	0.26	0.20	9.01	0.01	VG	
PIC Pune		0.19	0.24	0.32	2.01	0.05	VG	
AIC Akola		0.03	0.13	0.66	1.03	0.01	VG	
CADA Jalgaon		0.45	0.75	0.74	0.83	0.20	VG	
Surplus	CADA Nagpur	0.11	0.17	0.22	0.38	0.01	0.22	VG
Abundant	CIPC Chandrapur	0.03	0.04	0.05	0.06	0.01	0.13	BA
	CADA Pune	0.08	0.14	0.10	0.14	0.05		F
	SIC Sangli	0.13	0.15	0.16	0.24	0.03		G
	TIC Thane	0.51	0.43	0.70	1.92	0.01		VG

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in blue are excluded for Avg Per

**Indicator – VIII (I) : Revenue per unit of Water Supplied (Irrigation)**

CADA Aurangabad, CADA Jalgaon, CADA Beed (deficit) and UWPC Amrawati, NIC Nagpur, CADA Nashik, CADA Jalgaon, CADA Pune,(normal) CADA Nagpur (surplus) and TIC Thane (abundant) have improve the recovery.

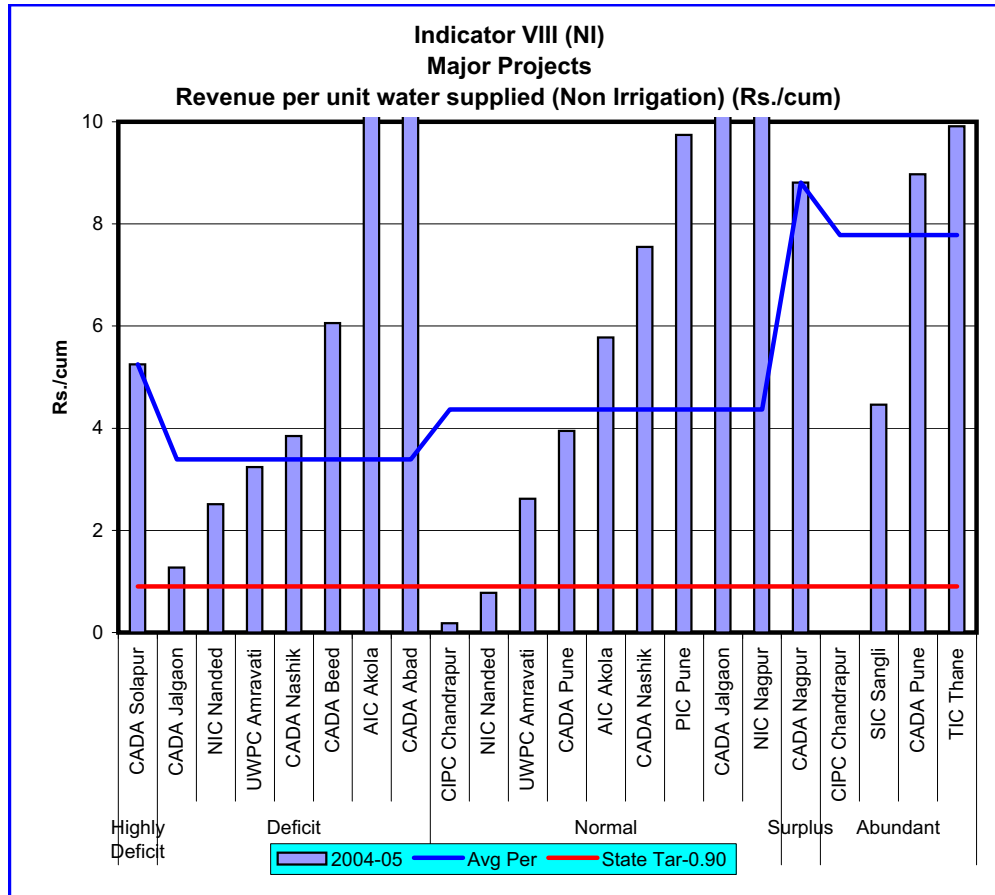


Plangroup	Circle	2004-05	Avg Per	State Tar-0	Rank
Highly Deficit	CADA Solapur	0.04	0.04	0.04	VG
Deficit	CADA Abad	0.01	0.05	0.04	BA
	CADA Jalgaon	0.01		0.04	BA
	CADA Beed	0.03		0.04	M
	NIC Nanded	0.04		0.04	VG
	CADA Nashik	0.05		0.04	VG
	AIC Akola	0.09		0.04	VG
	UWPC Amravati	0.11		0.04	VG
Normal	AIC Akola	No Recov	0.05	0.04	---
	UWPC Amravati	0.01		0.04	BA
	NIC Nagpur	0.01		0.04	BA
	CADA Nashik	0.02		0.04	BA
	CADA Jalgaon	0.02		0.04	BA
	CADA Pune	0.03		0.04	M
	PIC Pune	0.05		0.04	VG
	CIPC Chandrapur	0.06		0.04	VG
	NIC Nanded	0.18		0.04	VG
Surplus	CADA Nagpur	0.03	0.03	0.04	M
Abundant	TIC Thane	0.01	0.05	0.04	BA
	CADA Pune	0.05		0.04	VG
	CIPC Chandrapur	0.05		0.04	VG
	SIC Sangli	0.08		0.04	VG

Note: Figures in red indicate values exceeding range of graph.

**Indicator – VIII (NI) : Revenue per unit of Water Supplied (Non Irrigation)**

Except CIPC Chandrapur (norman & abundant) and NIC Nanded (normal) all circles have achieved more than State target manly due to recovery of arrears.



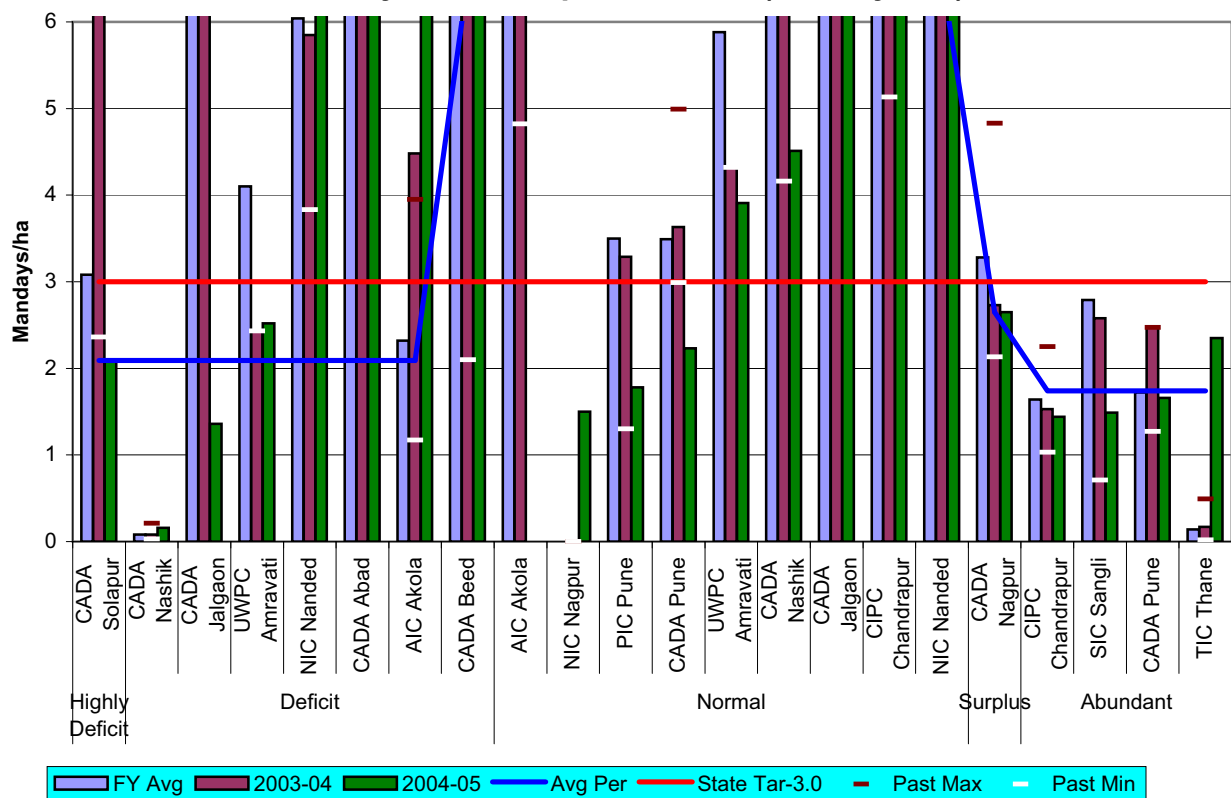
Plangroup	Circle	2004-05	Avg Per	State Tar-0.90	Rank
Highly Deficit	CADA Solapur	5.25	5.25	0.90	VG
Deficit	CADA Jalgaon	1.27	3.39	0.90	VG
	NIC Nanded	2.51			VG
	UWPC Amravati	3.24			VG
	CADA Nashik	3.85			VG
	CADA Beed	6.06			VG
	AIC Akola	10.24			VG
	CADA Abad	12.73			VG
Normal	CIPC Chandrapur	0.18	4.37	0.90	BA
	NIC Nanded	0.78			VG
	UWPC Amravati	2.62			VG
	CADA Pune	3.95			VG
	AIC Akola	5.78			VG
	CADA Nashik	7.55			VG
	PIC Pune	9.74			VG
	CADA Jalgaon	11.80			VG
	NIC Nagpur	16.81			VG
Surplus	CADA Nagpur	8.81	8.81	0.90	VG
Abundant	CIPC Chandrapur	No Recov	7.78	0.90	----
	SIC Sangli	4.46			VG
	CADA Pune	8.97			VG
	TIC Thane	9.91			VG

Note: Figures in red indicate values exceeding range of graph.

### **Indicator IX : Mandays for O&M per unit Area**

- 1) In Bhima project under CADA, Solapur, (highly deficit) the area brought under irrigation is increased over the past and hence mandays per unit area have come down from 7.59 to 2.09.
- 2) Mandays for O&M per unit area in Girna project under CADA Jalgaon (deficit) have reduced from 20.22 to 1.36. This is due to retirement of some CRT staff & increase in area under irrigation (from 4434 ha in 2003-04 to 55350 ha in 2004-05).
- 3) In Purna project under NIC Nanded (deficit), the area under irrigation is reduced from 38757 ha to 14429 ha, whereas mandays remained constant. In Manar project, however, the mandays are reduced due to retirement of CRT staff (nearly 50 persons). However, the overall mandays per unit area for the circle as a whole has increased.
- 4) In Jayakwadi project under CADA Aurangabad (deficit) the irrigated area during 2004-05 has increased 4.5 times whereas mandays remained more or less the same, resulting in reduction in mandays per ha from 37.17 to 7.90.
- 5) Mandays utilisation on Nalganga & Katepurna when considered combinely for AIC Akola (deficit), has increased, as there is no irrigation on Katepurna project. In respect of Nalganga, the ratio has increased from 2.20 (2003-04) to 4.41 (2004-05) due to reduction in irrigated area.
- 6) In Majalgaon project under CADA Beed (deficit) the area irrigated during 2004-05 has increased 10 times and at the same time, there is a slight reduction in mandays. This has resulted in reducing the ratio substantially.
- 7) Upper Wardha (UWPC Amravati-normal), Pench, Bagh, Itiadh (CADA Nagpur-surplus) and Asolamendha and Dina projects (CIPC Chandrapur-abundant) have improved their performance as compared to the past.
- 8) On Bor project (CIPC Chandrapur-normal), mandays utilisation per ha. is quite high, as compared to the State target. The reason being excessive CRT staff working on the project.

**Indicator IX  
Major Projects  
Mandays for O&M per unit area (Mandays/ha)**



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	3.08	7.59	2.09	7.59	2.36	2.09	VG
Deficit	CADA Nashik	0.08	0.08	0.16	0.21	0.03		VG
	CADA Jalgaon	13.86	20.22	1.36	498.71	6.27		VG
	UWPC Amravati	4.10	2.43	2.52	8.66	2.43		VG
	NIC Nanded	6.04	5.85	7.79	14.59	3.83	4.89	BA
	CADA Abad	16.89	37.17	7.90	37.17	8.72		BA
	AIC Akola	2.32	4.48	9.72	3.95	1.17		BA
	CADA Beed	13.62	489.13	19.09	167.53	2.10		BA
Normal	AIC Akola	8.32	9.96	No Irr	24.00	4.82		--
	NIC Nagpur	0.02	No Irr	1.50	No Irr	0.02		VG
	PIC Pune	3.50	3.29	1.78	14.04	1.30		VG
	CADA Pune	3.49	3.63	2.23	4.99	2.99		VG
	UWPC Amravati	5.88	4.32	3.91	8.47	4.32	3.11	F
	CADA Nashik	6.98	6.50	4.51	32.78	4.16		BA
	CADA Jalgaon	11.04	9.72	7.29	12.97	9.17		BA
	CIPC Chandrapur	6.17	6.45	13.75	12.85	5.13		BA
	NIC Nanded	11.32	8.22	21.46	14.66	8.22		BA
Surplus	CADA Nagpur	3.28	2.73	2.65	4.83	2.13	2.65	VG
Abundant	CIPC Chandrapur	1.64	1.53	1.44	2.25	1.03		VG
	SIC Sangli	2.79	2.58	1.49	9.36	0.71		VG
	CADA Pune	1.72	2.47	1.66	2.47	1.27	1.74	VG
	TIC Thane	0.14	0.17	2.35	0.49	0.02		VG

Note: 1) Figures in red indicate values exceeding range of graph.

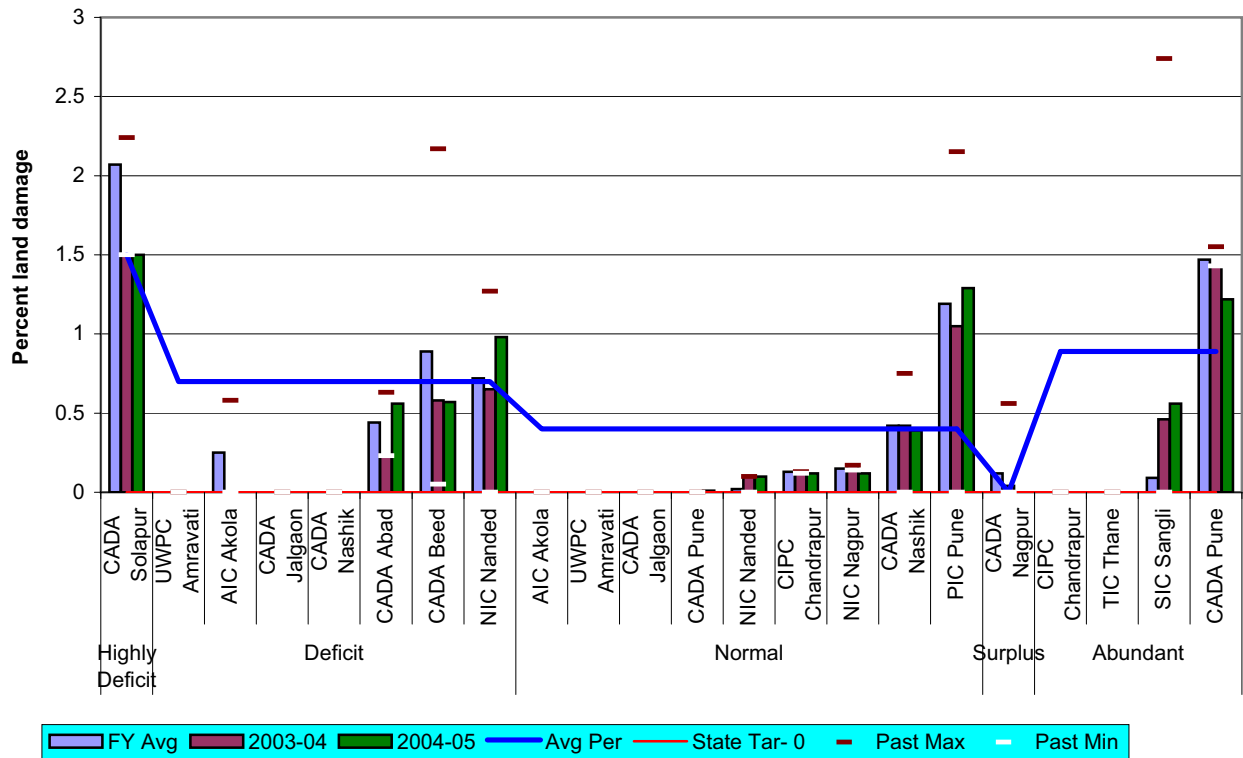
2) Figures in blue excluded for Avg Per



**Indicator X : Land Damage Index**

- 1) In Bhima project under CADA Solapur (highly deficit), 2974 ha of land were observed to be damaged. The damaged area is reduced from 4427 ha in 2002-03 to 2974 ha in 2004-05.
- 2) In Jayakwadi project under CADA Aurangabad (deficit), the area of land damage has increased from 425 to 1028 ha whereas in Purna project, it has increased from 703 to 1211 ha. It is, therefore, necessary to monitor and reclaim the damaged land under both the projects.
- 3) Land damaged area in Manar project of NIC Nanded (deficit) is reduced from 235 to 205 ha.
- 4) Increase in land damaged area under PIC Pune (normal) was observed in NLBC (from 1248 ha to 1356 ha), in NRBC (from 1886 ha to 2589 ha) and in Radhanagari (from 972 ha to 1100 ha) under SIC Sangli (abundant). It is necessary to monitor the process of reclamation under these projects.

**Indicator X  
Major Projects  
Land Damage Index**



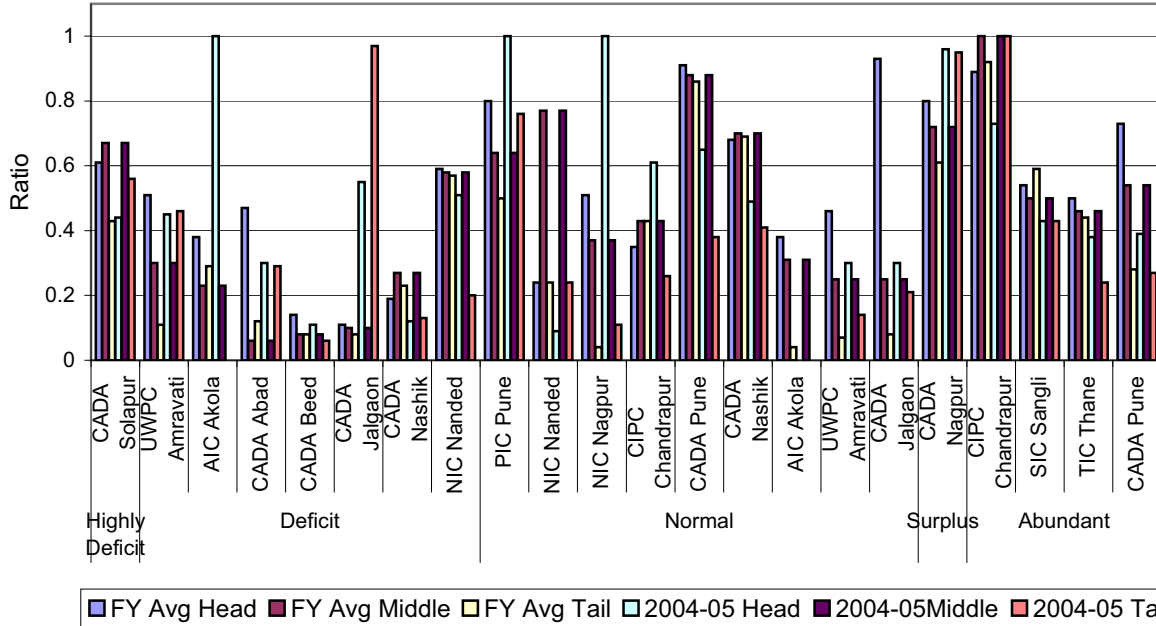
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	2.07	1.50	1.50	2.24	1.50	1.50	M
Deficit	UWPC Amravati	0.00	0.00	0.00	0.00	0.00	0.70	VG
	AIC Akola	0.25	0.00	0.00	0.58	0.00		VG
	CADA Jalgaon	0.00	0.00	0.00	0.00	0.00		VG
	CADA Nashik	0.00	0.00	0.00	0.00	0.00		VG
	CADA Abad	0.44	0.23	0.56	0.63	0.23		G
	CADA Beed	0.89	0.58	0.57	2.17	0.05		G
	NIC Nanded	0.72	0.65	0.98	1.27	0.00		G
	Normal	AIC Akola	0.00	0.00	0.00	0.00		0.00
UWPC Amravati		0.00	0.00	0.00	0.00	0.00	VG	
CADA Jalgaon		0.00	0.00	0.00	0.00	0.00	VG	
CADA Pune		0.00	0.00	0.01	0.00	0.00	VG	
NIC Nanded		0.02	0.10	0.10	0.10	0.00	G	
CIPC Chandrapur		0.13	0.12	0.12	0.13	0.12	G	
NIC Nagpur		0.15	0.17	0.12	0.17	0.14	G	
CADA Nashik		0.42	0.42	0.39	0.75	0.00	G	
PIC Pune		1.19	1.05	1.29	2.15	0.00	M	
Surplus	CADA Nagpur	0.12	0.04	0.00	0.56	0.00	0.00	VG
Abundant	CIPC Chandrapur	0.00	0.00	0.00	0.00	0.00	0.89	VG
	TIC Thane	0.00	0.00	0.00	0.00	0.00		VG
	SIC Sangli	0.09	0.46	0.56	2.74	0.00		G
	CADA Pune	1.47	1.43	1.22	1.55	1.43		M

Note: 1) Figures in red exceeds range of graph. 2) Figures in blue excluded for Avg Per.

**Indicator XI :      Equity Performance**

- 1)      Projects under SIC Sangli (abundant) could supply water to head, middle and tail reach farmers quite equitably.

**Indicator XI  
Major Projects  
Equity Performance**

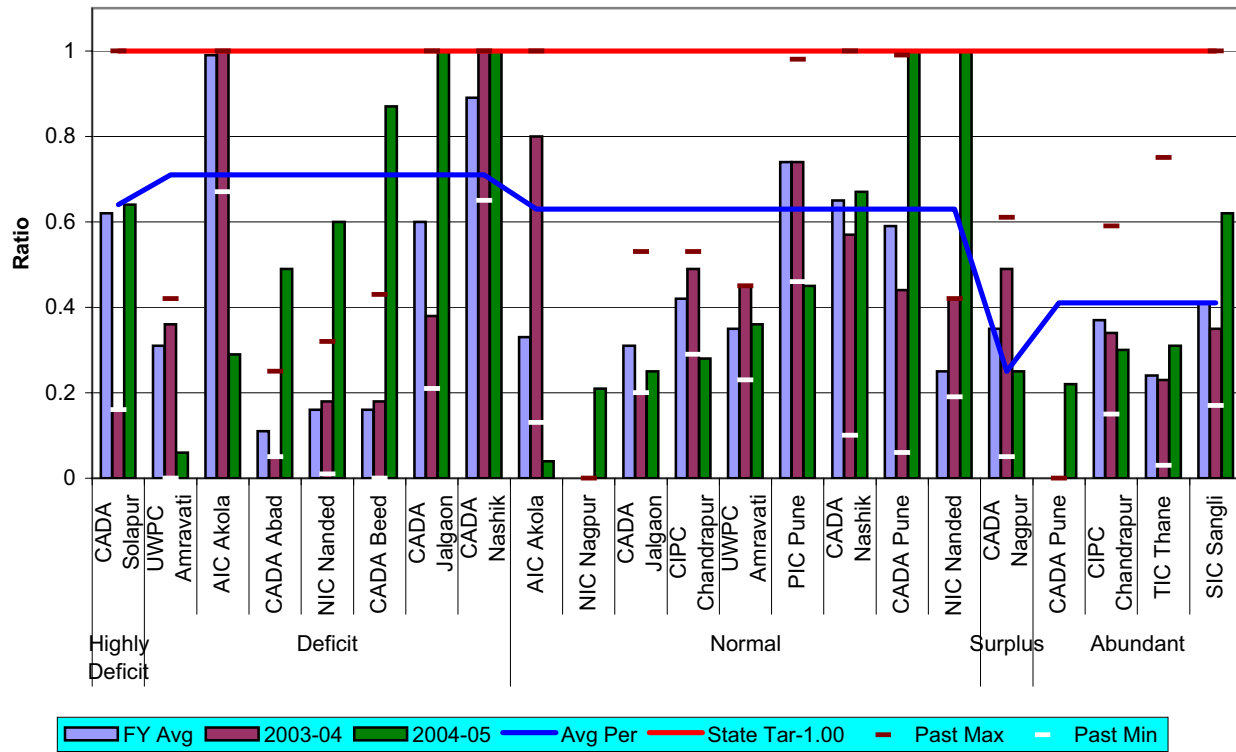


Plangroup	Circle	FY Avg			2004-05		
		Head	Middle	Tail	Head	Middle	Tail
Highly Deficit	CADA Solapur	0.61	0.67	0.43	0.44	0.67	0.56
Deficit	UWPC Amravati	0.51	0.30	0.11	0.45	0.30	0.46
	AIC Akola	0.38	0.23	0.29	1.00	0.23	0.00
	CADA Abad	0.47	0.06	0.12	0.30	0.06	0.29
	CADA Beed	0.14	0.08	0.08	0.11	0.08	0.06
	CADA Jalgaon	0.11	0.10	0.08	0.55	0.10	0.97
	CADA Nashik	0.19	0.27	0.23	0.12	0.27	0.13
	NIC Nanded	0.59	0.58	0.57	0.51	0.58	0.20
Normal	PIC Pune	0.80	0.64	0.50	1.00	0.64	0.76
	NIC Nanded	0.24	0.77	0.24	0.09	0.77	0.24
	NIC Nagpur	0.51	0.37	0.04	1.00	0.37	0.11
	CIPC Chandrapur	0.35	0.43	0.43	0.61	0.43	0.26
	CADA Pune	0.91	0.88	0.86	0.65	0.88	0.38
	CADA Nashik	0.68	0.70	0.69	0.49	0.70	0.41
	AIC Akola	0.38	0.31	0.04	0.00	0.31	0.00
	UWPC Amravati	0.46	0.25	0.07	0.30	0.25	0.14
	CADA Jalgaon	0.93	0.25	0.08	0.30	0.25	0.21
Surplus	CADA Nagpur	0.80	0.72	0.61	0.96	0.72	0.95
Abundant	CIPC Chandrapur	0.89	1.00	0.92	0.73	1.00	1.00
	SIC Sangli	0.54	0.50	0.59	0.43	0.50	0.43
	TIC Thane	0.50	0.46	0.44	0.38	0.46	0.24
	CADA Pune	0.73	0.54	0.28	0.39	0.54	0.27

### **Indicator XII (I) : Assessment Recovery Ratio (Irrigation)**

- 1) The recovery of assessment for irrigation has increased from Rs. 128.77 lakh in 2003-04 to Rs. 455.44 lakh in 2004-05 in Bhima project under CADA Solapur (highly deficit). The improvement is due to special drive taken for recovery and availability of water.
- 2) Every project under AIC Akola (deficit & normal), UWPC Amravati (deficit), NIC Nagpur (normal), CIPC Chandrapur (normal), CADA Nagpur (surplus) and CADA Jalgaon (normal) have very low rate of realization of irrigation revenue.
- 3) The performance of all above circles except NIC Nagpur (normal) and CADA Jalgaon (normal) has declined as compared to their last year's performance.
- 4) The assessment recovery ratio (Irrigation) for CADA Jalgaon (deficit) has increased from 0.38 to 1.00 achieving the State target due to all out efforts taken by field staff for recovery of revenue.
- 5) The recovery of water charges for irrigation in Ghod project during 2004-05 was 95 percent and in Kukadi project it was 100 percent. This has resulted in increasing the ratio for CADA Pune (normal) from 0.44 to 1.

**Indicator XII -I  
Major Projects  
Assessment Recovery Ratio (Irrigation)**



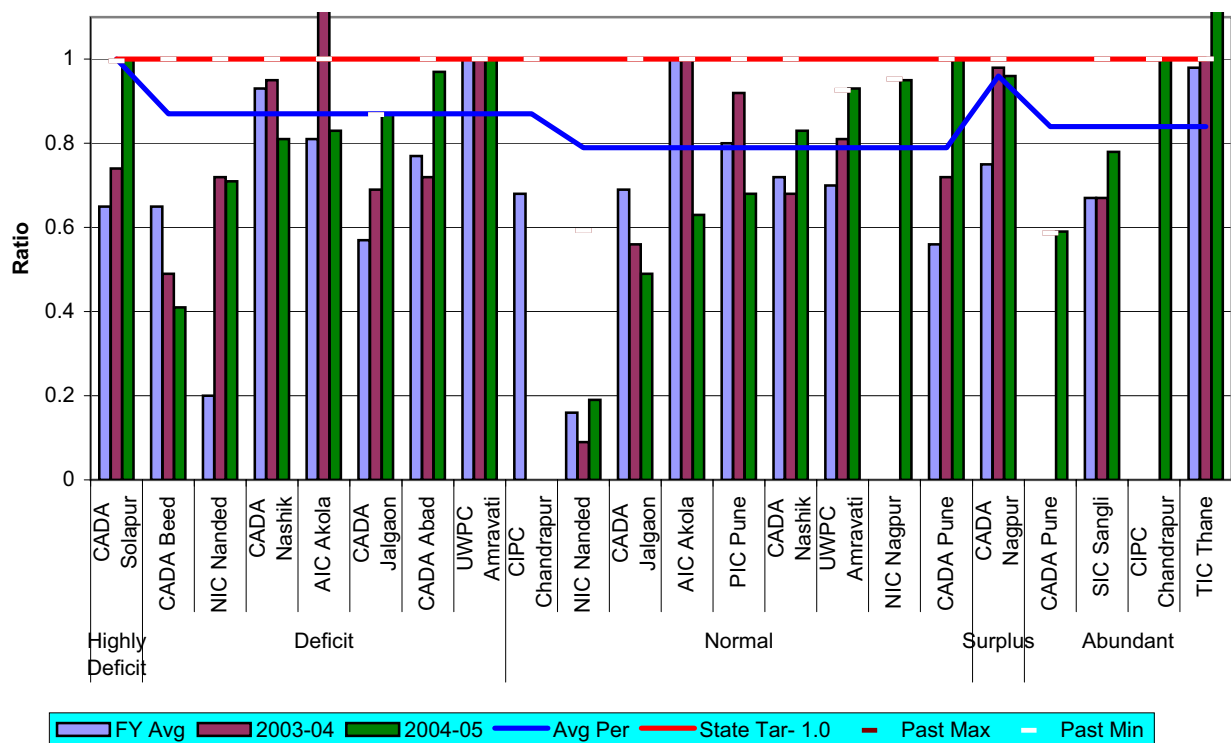
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	0.62	0.16	0.64	1.00	0.16	0.64	F
Deficit	UWPC Amravati	0.31	0.36	0.06	0.42	0.00	0.71	BA
	AIC Akola	0.99	1.00	0.29	1.00	0.67		BA
	CADA Abad	0.11	0.05	0.49	0.25	0.05		BA
	NIC Nanded	0.16	0.18	0.60	0.32	0.01		F
	CADA Beed	0.16	0.18	0.87	0.43	0.00		G
	CADA Jalgaon	0.60	0.38	1.00	1.00	0.21		VG
	CADA Nashik	0.89	1.00	1.00	1.00	0.65		VG
	Normal	AIC Akola	0.33	0.80	0.04	1.00		0.13
NIC Nagpur		0.00	0.00	0.21	0.00	0.15	BA	
CADA Jalgaon		0.31	0.20	0.25	0.53	0.20	BA	
CIPC Chandrapur		0.42	0.49	0.28	0.53	0.29	BA	
UWPC Amravati		0.35	0.45	0.36	0.45	0.23	BA	
PIC Pune		0.74	0.74	0.45	0.98	0.46	BA	
CADA Nashik		0.65	0.57	0.67	1.00	0.10	F	
CADA Pune		0.59	0.44	1.00	0.99	0.06	VG	
NIC Nanded		0.25	0.42	1.00	0.42	0.19	VG	
Surplus	CADA Nagpur	0.35	0.49	0.25	0.61	0.05	0.25	BA
Abundant	CADA Pune	0.00	0.00	0.22	0.00	0.18	0.41	BA
	CIPC Chandrapur	0.37	0.34	0.30	0.59	0.15		BA
	TIC Thane	0.24	0.23	0.31	0.75	0.03		BA
	SIC Sangli	0.41	0.35	0.62	1.00	0.17		F

Note: Figures in blue are excluded for Avg Per.

**Indicator XII (NI) : Assessment Recovery Ratio (Non-Irrigation)**

- 1) As compared to irrigation revenue recovery, the realisation of revenue from non-irrigation use in 5 out of 22 circles is to the mark, achieving very good performance.
- 2) The recovery of water charges for non-irrigation use during 2004-05 in Bhima project under CADA Solapur (highly deficit) was 100 percent, improving the overall performance.
- 3) All projects under AIC Akola, (deficit), CADA Nashik (deficit and normal) NIC Nagpur (normal) & CADA Nagpur (surplus) have recovered more than 80 percent revenue.
- 4) Performance of Ghod, Kukadi projects under CADA Pune (normal) was 100 percent , elevating the overall performance of the circle.
- 5) NIC Nagpur (normal) & CADA Nagpur (surplus) have recovered more than 80 percent revenue.

**Indicator XII-NI  
Major Projects  
Assessment Recovery Ratio (Non Irrigation)**



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	0.65	0.74	1.00	1.00	1.00	1.00	VG
Deficit	CADA Beed	0.65	0.49	0.41	1.00	1.00	0.87	BA
	NIC Nanded	0.20	0.72	0.71	1.00	1.00		M
	CADA Nashik	0.93	0.95	0.81	1.00	1.00		M
	AIC Akola	0.81	1.28	0.83	1.00	1.00		M
	CADA Jalgaon	0.57	0.69	0.87	0.87	0.87		G
	CADA Abad	0.77	0.72	0.97	1.00	1.00		G
	UWPC Amravati	1.00	1.00	1.00	1.00	1.00		VG
Normal	CIPC Chandrapur	0.68	0.00	0.00	1.00	1.00	0.79	BA
	NIC Nanded	0.16	0.09	0.19	0.59	0.59		BA
	CADA Jalgaon	0.69	0.56	0.49	1.00	1.00		BA
	AIC Akola	1.00	1.00	0.63	1.00	1.00		F
	PIC Pune	0.80	0.92	0.68	1.00	1.00		F
	CADA Nashik	0.72	0.68	0.83	1.00	1.00		M
	UWPC Amravati	0.70	0.81	0.93	0.93	0.93		G
	NIC Nagpur	0.00	0.00	0.95	0.95	0.95		G
CADA Pune	0.56	0.72	1.00	1.00	1.00	VG		
Surplus	CADA Nagpur	0.75	0.98	0.96	1.00	1.00	0.96	G
Abundant	CADA Pune	0.00	0.00	0.59	0.59	0.59	0.84	F
	SIC Sangli	0.67	0.67	0.78	1.00	1.00		M
	CIPC Chandrapur	0.00	0.00	1.00	1.00	1.00		VG
	TIC Thane	0.98	1.00	1.00	1.00	1.00		VG

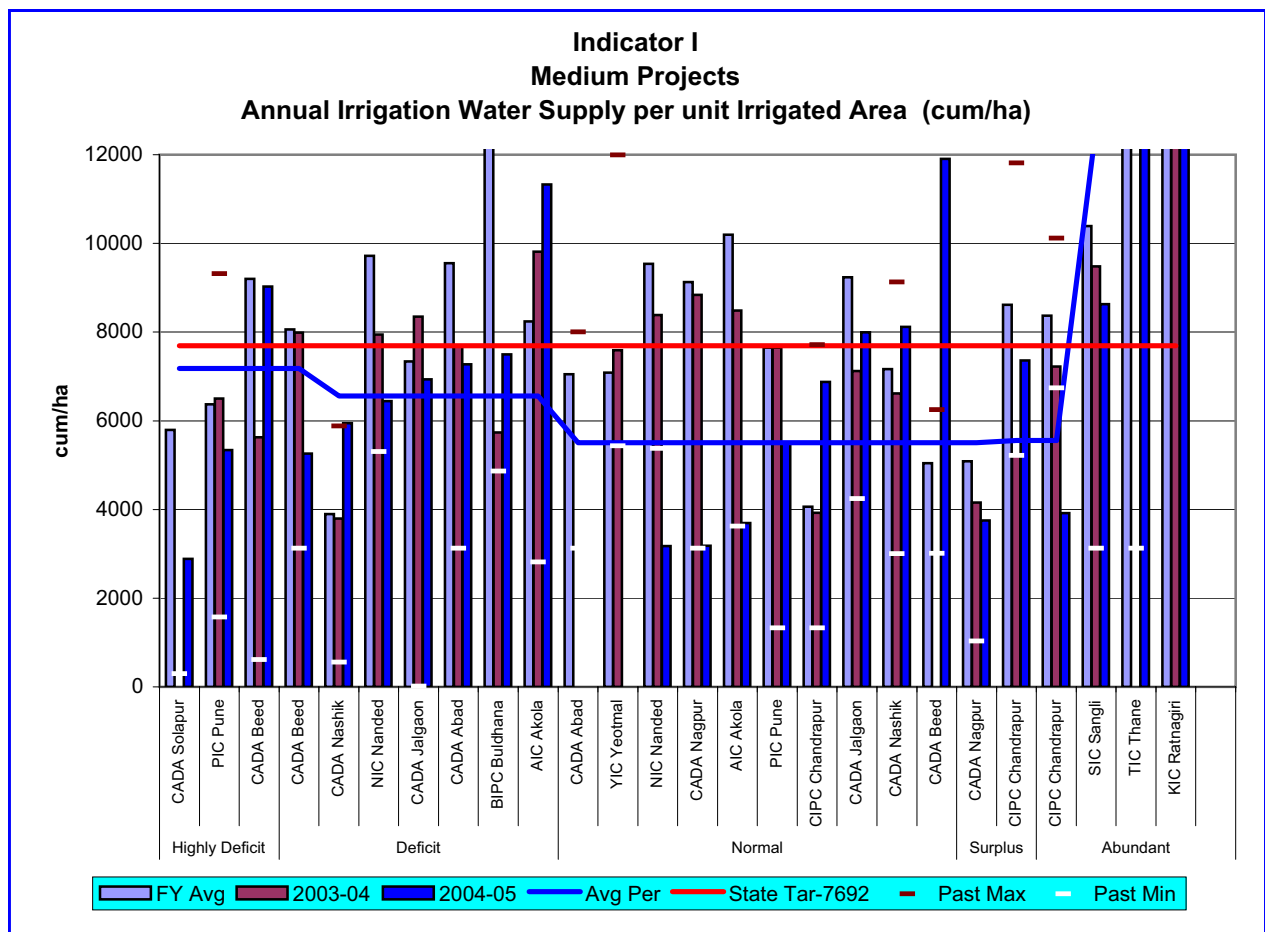
Note: Figures in blue are excluded for Avg Per.



## Medium Projects

### Indicator I : Annual irrigation water supply per unit area irrigated:

- 1) Annual water supply per unit irrigated area in projects under CADA Beed (highly deficit) has increased compared to last year, due to lower WUE in Kurnoor, Kada, Khasapur & Turori projects.
- 2) The performance of projects under CADA Nashik (deficit) has improved from below average in 2003-04 to moderate in 2004-05, due to enhanced WUE in Haranbari and Kelzar project.
- 3) Under BIPC Buldhana (deficit) water storages in Mun and Torna were 21 percent and 25.8 percent respectively. The water for irrigation was economically used. Hence the ratio achieved is close to the State target.
- 4) In Shahanoor project under AIC Akola (deficit), the live storage was only 12 percent and transit losses were more, on account of scattered area of irrigation. Obviously, the water use for irrigation per /ha area irrigated is more.
- 5) The ratio has come down from 8383 to 3175 in projects under NIC Nanded (normal) as only two rotations were given in Nagzari project, due to lesser availability of water.
- 6) Major portion of area irrigated on Koradi project under AIC Akola (normal) is on reservoir lift. Therefore, annual water use is just 3698 m<sup>3</sup>/ha.
- 7) Panchdhara, Pothara, Dongargoan, Chargaon, Chandai & Labhansarad under CIPC Chandrapur (normal) have water use per unit area irrigated near to State target. More transit losses on Panchdhara project and low maintenance of canal system along with low rainfall in command, has increased the irrigation water use as compared to last year (2003-04).
- 8) Water use efficiency in Khandala project under CADA Beed (normal) is very low resulting in higher water use.
- 9) During 2004-05 in Naleshwar under CIPC Chandrapur (abundant) only protective irrigation was given. Therefore, the annual water use per ha area irrigated is low compared to the State target.
- 10) In Wandri project under TIC Thane (abundant), the ratio is quite high (25361cum/ha) as compared to other projects in the State. The utilisation is less than 40 percent in last five years. Hot climate, paddy dominant cropping, field to field irrigation and percolating soil are the main reasons for higher value. During 2004-05, the water use is reduced to nearly half of its five years' average.
- 11) In Natuwadi project under KIC Ratnagiri (abundant), the ratio is 129172 cum/ha against 13273 cum/ha planned. The project authorities are required to concentrate on bringing down the water use per hectare. It is necessary, to reduce the water use and bring it to projected value.



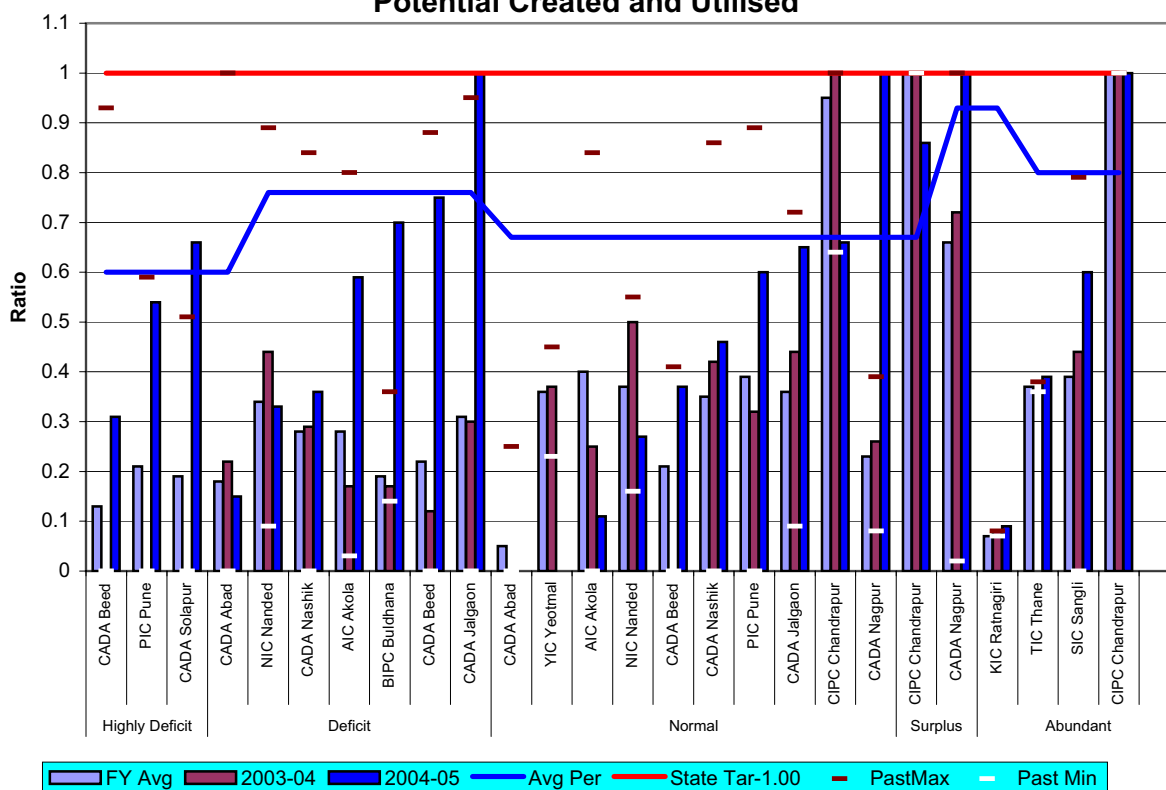
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	5792	No Water	2887	15315	298	7183	BA
	PIC Pune	6373	6500	5339	9319	1576		F
	CADA Beed	9198	5630	9027	38000	610		M
Deficit	CADA Beed	8060	7991	5257	14782	3125	6559	F
	CADA Nashik	3893	3792	5943	5883	556		M
	NIC Nanded	9723	7948	6447	18571	5306		M
	CADA Jalgaon	7340	8347	6935	804791	11		G
	CADA Abad	9553	7687	7272	22671	3125		G
	BIPC Buldhana	12702	5740	7500	25150	4864		G
	AIC Akola	8241	9811	11329	53353	2817		F
	Normal	CADA Abad	7051	No Water	No Water	8000		3125
YIC Yeotmal		7083	7591	No Water	11992	5430	---	
NIC Nanded		9536	8383	3175	19164	5377	BA	
CADA Nagpur		9129	8836	3181	19549	3125	BA	
AIC Akola		10195	8489	3698	19218	3621	BA	
PIC Pune		7648	7651	5504	13162	1327	M	
CIPC Chandrapur		4062	3926	6877	7717	1326	G	
CADA Jalgaon		9235	7119	7997	32940	4241	G	
CADA Nashik		7165	6619	8117	9130	3000	G	
CADA Beed		5043	No Water	11909	6252	3007	BA	
Surplus	CADA Nagpur	5086	4156	3753	59960	1032	5557	BA
	CIPC Chandrapur	8618	5218	7360	11810	5218		G
Abundant	CIPC Chandrapur	8372	7222	3915	10118	6742	12634	F
	SIC Sangli	10391	9483	8627	22738	3125		G
	TIC Thane	47014	No Water	25361	49152	3125		BA
	KIC Ratnagiri	73060	51625	129172	96115	45759		BA

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in red & blue excluded for Avg Per  
3) 'No Water' indicates reservoirs are not filled in that year.

## **Indicator II : Potential Created & Utilised**

- 1) The utilisation of potential in projects under CADA Solapur (highly deficit) is improved as more area in the command of the projects is irrigated through lifts either on reservoir or rivers and nallas in the command.
- 2) Nearly 60 to 70 percent of the effective created potential is utilised on Shahanoor project under AIC Akola (deficit) and Mun project under BIPC Buldhana (deficit). More transit losses, scattered area under irrigation and low water demand for irrigation, attributes to the difference between achievement & the State target.
- 3) The performance of projects under CADA Beed (deficit) seems to be improved from 0.12 in 2003-04 to 0.75 in 2004-05 on account of protective irrigation on four projects viz. Vhati, Terna, Rui & Raigavan.
- 4) The ratio for projects viz, Agnawati, Hiwara, Bhokarbari, Tondapur, Burai & Rangavali under CADA Jalgaon (deficit), has increased from 0.30 (2003-04) to 1.00 (2004-05), due to improved water use efficiency
- 5) Koradi under AIC Akola (normal) have only 14 percent live storage & Panchadhara, Pothra, Chandai, Chargaon & Labhansarad under CIPC Chandrapur (normal) have more transit losses, scattered area under irrigation and low water demand in Rabbi for irrigation. These factors have attributed to the difference in achievement & the State target.
- 6) In projects under PIC Pune (normal), the performance has been improved as compared to past. 100 percent area under lift irrigation on Mhaswad project and irrigation through K. T. Weirs in Wadivale project, have improved the WUE, resulting in improving the performance.
- 7) The enhanced water use efficiency on Aner, Karwand & Malangaon projects under CADA Jalgaon (normal), has resulted in increasing the ratio from 0.44 (2003-04) to 0.65 (2004-05).
- 8) On Ghorazari & Naleshwar projects under CIPC Chandrapur (abundant), through protective irrigation 100 percent potential utilisation is achieved.

## Indicator II Medium Projects Potential Created and Utilised



Plangroup	Circle	FY Avg	2003-04	2004-05	PastMax	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	0.13	No Water	0.31	0.93	0.02	0.60	BA
	PIC Pune	0.21	No Water	0.54	0.59	0.02		F
	CADA Solapur	0.19	No Water	0.66	0.51	0.05		F
Deficit	CADA Abad	0.18	0.22	0.15	1.00	0.01	0.76	BA
	NIC Nanded	0.34	0.44	0.33	0.89	0.09		BA
	CADA Nashik	0.28	0.29	0.36	0.84	0.04		BA
	AIC Akola	0.28	0.17	0.59	0.80	0.03		F
	BIPC Buldhana	0.19	0.17	0.70	0.36	0.14		M
	CADA Beed	0.22	0.12	0.75	0.88	0.01		M
	CADA Jalgaon	0.31	0.30	1.00	0.95	0.01		VG
Normal	CADA Abad	0.05	No Water	No Water	0.25	0.01	0.67	---
	YIC Yeotmal	0.36	0.37	No Water	0.45	0.23		---
	AIC Akola	0.40	0.25	0.11	0.84	0.01		BA
	NIC Nanded	0.37	0.50	0.27	0.55	0.16		BA
	CADA Beed	0.21	No Water	0.37	0.41	0.30		BA
	CADA Nashik	0.35	0.42	0.46	0.86	0.07		BA
	PIC Pune	0.39	0.32	0.60	0.89	0.03		F
	CADA Jalgaon	0.36	0.44	0.65	0.72	0.09		F
	CIPC Chandrapur	0.95	1.00	0.66	1.00	0.64		F
	CADA Nagpur	0.23	0.26	1.00	0.39	0.08		VG
Surplus	CIPC Chandrapur	1.00	1.00	0.86	1.00	1.00	0.93	G
	CADA Nagpur	0.66	0.72	1.00	1.00	0.02		VG
Abundant	KIC Ratnagiri	0.07	0.08	0.09	0.08	0.07	0.80	BA
	TIC Thane	0.37	No Water	0.39	0.38	0.36		BA
	SIC Sangli	0.39	0.44	0.60	0.79	0.14		F
	CIPC Chandrapur	1.00	1.00	1.00	1.00	1.00		VG

Note:1) Figures in blue excluded for Avg Per

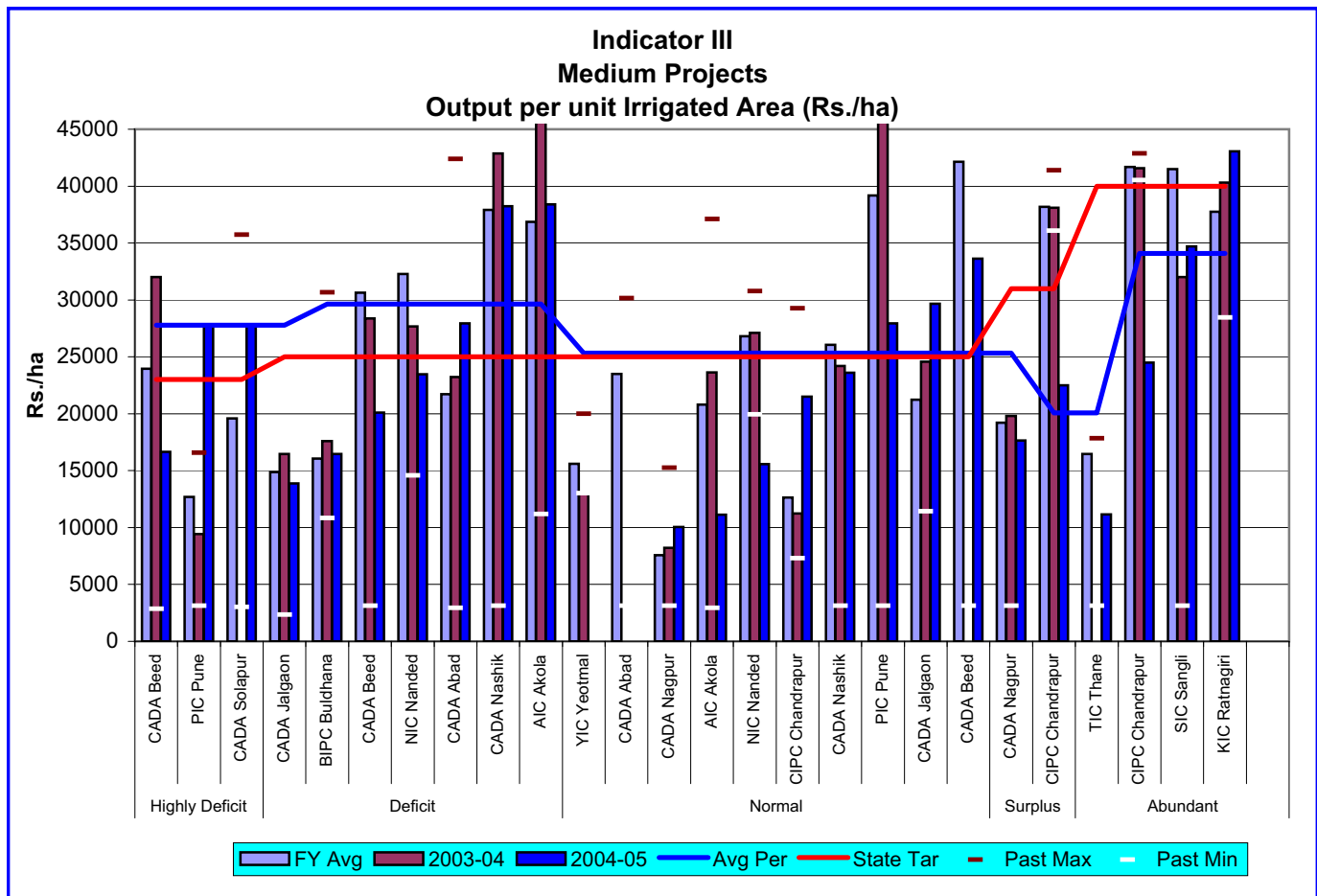
2) 'No Water' indicates reservoirs are not filled in that year.

### **Indicator III : Output Per Unit Area Irrigated**

1) The output per unit irrigated area, in projects under NIC Nanded (deficit & normal) has been reduced compared to last years performance, mainly due to the provision of two rotations in Rabi season in Kudala, Karadkhed & Nagzari projects.

2) In 2004-05, the percentage of cash crops grown in the command of Mun, Torna under BIPC Buldhana (deficit), Koradi under AIC Akola (normal), Panchdhara under CIPC Chandrapur (normal) has been reduced, due to lesser availability of water for irrigation. Therefore, output per unit area is low on these projects.

3) The output in case of Suki project under CADA Jalgaon (normal) has been increased, due to increase in area under sugarcane & banana from 28 ha to 88 ha & 484 ha to 1122 ha respectively.

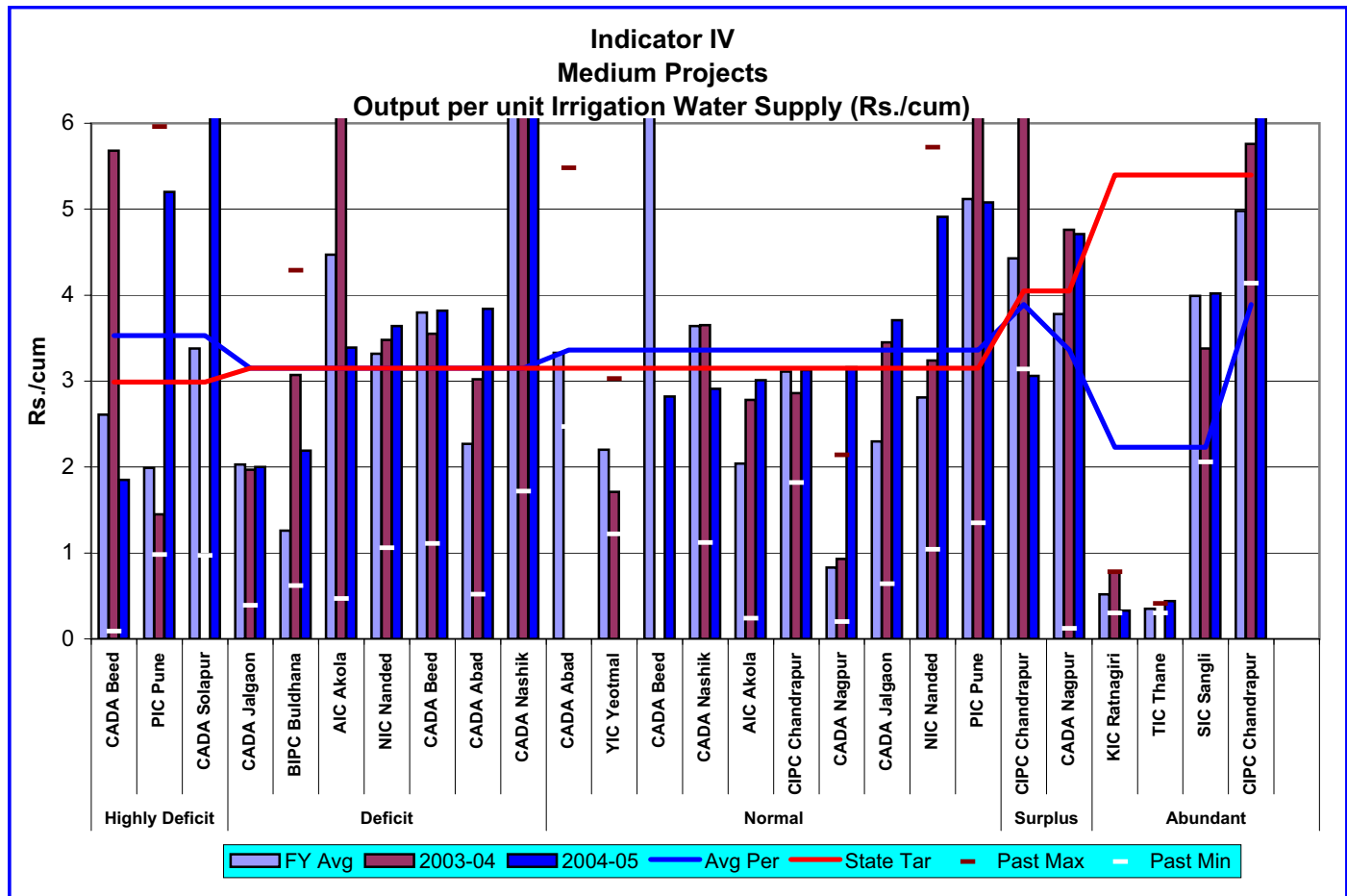


Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	St. Tar	Rank
Highly Deficit	CADA Beed	23964	32000	16661	51555	2859	27777	23000	M
	PIC Pune	12694	9425	27739	16578	3125		23000	VG
	CADA Solapur	19602	No Water	27815	35727	3021		23000	VG
Deficit	CADA Jalgaon	14868	16465	13885	818545	2352	29630	25000	F
	BIPC Buldhana	16066	17603	16460	30665	10830		25000	F
	CADA Beed	30644	28366	20093	83588	3125		25000	M
	NIC Nanded	32270	27665	23458	77408	14589		25000	G
	CADA Abad	21718	23223	27956	42387	2950		25000	VG
	CADA Nashik	37919	42867	38234	47060	3125		25000	VG
	AIC Akola	36856	61290	38409	125161	11177		25000	VG
Normal	YIC Yeotmal	15601	13017	No Water	20000	13017	25324	25000	---
	CADA Abad	23505	No Water	No Water	30142	3125		25000	---
	CADA Nagpur	7579	8217	10043	15253	3125		25000	BA
	AIC Akola	20791	23634	11128	37110	2929		25000	BA
	NIC Nanded	26799	27121	15575	30774	19948		25000	F
	CIPC Chandrapur	12630	11235	21507	29270	7291		25000	G
	CADA Nashik	26047	24186	23604	51715	3125		25000	G
	PIC Pune	39179	47900	27952	57324	3125		25000	VG
	CADA Jalgaon	21239	24577	29672	82021	11427		25000	VG
	CADA Beed	42138	No Water	33636	47901	3125		25000	VG
Surplus	CADA Nagpur	19226	19793	17659	51780	3125	20073	31000	F
	CIPC Chandrapur	38192	38100	22487	41386	36094		31000	M
Abundant	TIC Thane	16477	No Water	11153	17842	3125	34083	40000	BA
	CIPC Chandrapur	41688	41569	24500	42860	40538		40000	F
	SIC Sangli	41495	32024	34700	51088	3125		40000	G
	KIC Ratnagiri	37742	40312	43050	45225	28466		40000	VG

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in red & blue excluded for Avg Per  
3) 'No Water' indicates reservoirs are not filled in that year.

**Indicator IV : Output Per Unit Water Supply**

- 1) Output on Mun and Torna projects under BIPC Buldhana (deficit) is quite below the State target.
- 2) The reduction in output per unit irrigation water supply from Rs. 11.31/m<sup>3</sup> to Rs. 6.43/ m<sup>3</sup> in projects under CADA Nashik (deficit), is mainly due to reduced WUE in Haranbari & Nagyasakya projects.
- 3) On Koradi project under AIC Akola (normal), most of the area was irrigated on reservoir lifts, and better WUE could be obtained. This has increased the output per unit irrigation water supply.
- 4) Project under CIPC Chandrapur (normal) and Wunna Project under CADA Nagpur (normal) have improved their performance as compared to past. Economical water use for irrigation has led to improvement in the performance of these Projects.
- 5) The increase in output per unit water supply from Rs. 3.24 /m<sup>3</sup> to 4.91 /m<sup>3</sup> in Nagzari project under NIC Nanded (normal) is mainly due to improvement in water use efficiency
- 6) Naleshwar project under CIPC Chandrapur (abundant) has improved its performance as compared to past. Economical or limited water use for irrigation, as high-lighted in the analysis of first indicator, has led to improvement in the performance.



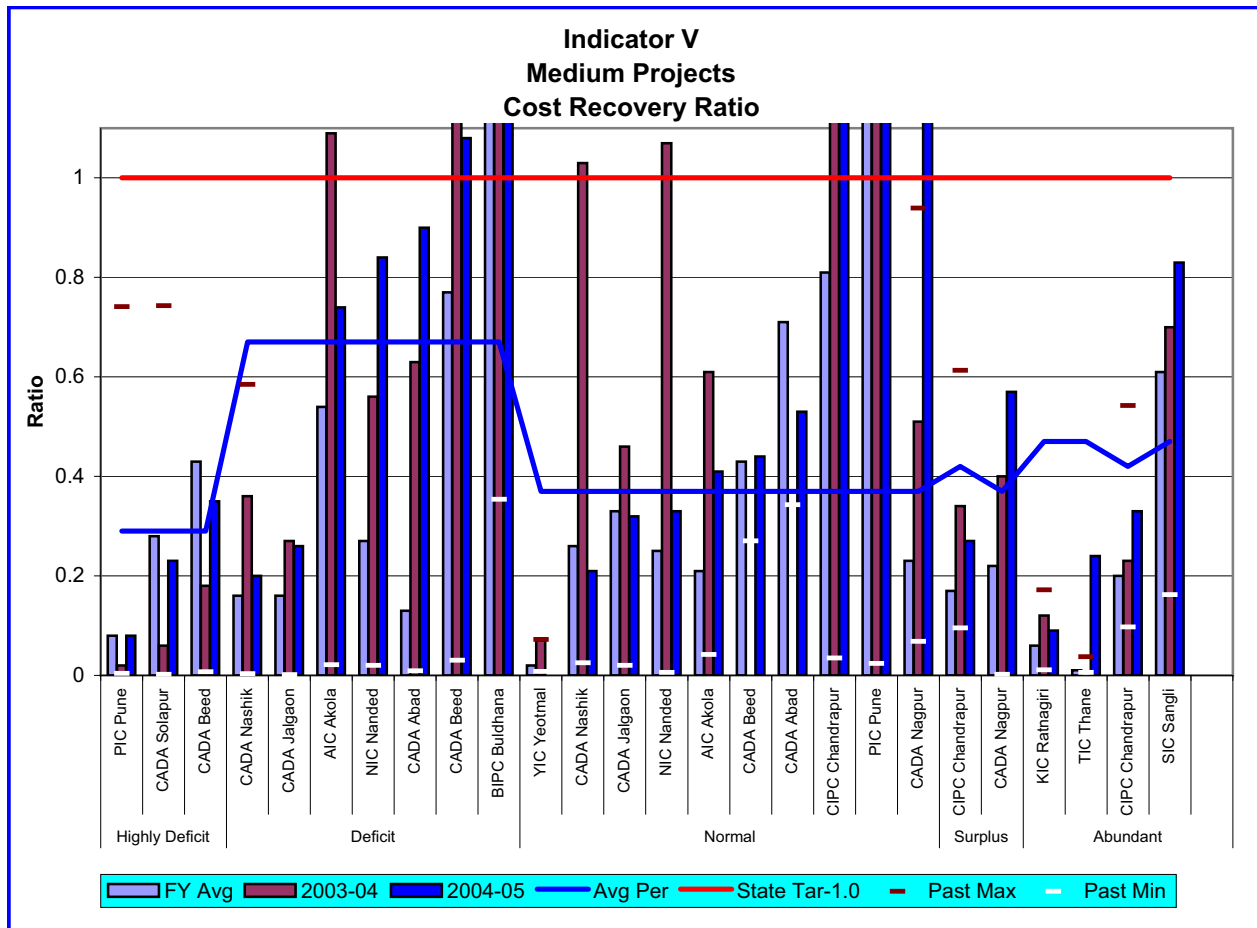
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	St. Tar	Rank
Highly Deficit	CADA Beed	2.61	5.68	1.85	11.15	0.09	3.53	2.99	F
	PIC Pune	1.99	1.45	5.20	5.96	0.98		2.99	VG
	CADA Solapur	3.38	No Water	9.63	57.16	0.97		2.99	VG
Deficit	CADA Jalgaon	2.03	1.97	2.00	549.90	0.39	3.15	3.15	F
	BIPC Buldhana	1.26	3.07	2.19	4.29	0.62		3.15	F
	AIC Akola	4.47	6.25	3.39	20.25	0.47		3.15	VG
	NIC Nanded	3.32	3.48	3.64	7.76	1.06		3.15	VG
	CADA Beed	3.80	3.55	3.82	16.03	1.11		3.15	VG
	CADA Abad	2.27	3.02	3.84	6.79	0.52		3.15	VG
	CADA Nashik	9.74	11.31	6.43	70.58	1.72		3.15	VG
	CADA Abad	3.33	No Water	No Water	5.48	2.47		3.15	-
Normal	YIC Yeotmal	2.20	1.71	No Water	3.03	1.22	3.36	3.15	-
	CADA Beed	8.36	No Water	2.82	13.44	6.35		3.15	G
	CADA Nashik	3.64	3.65	2.91	6.52	1.12		3.15	G
	AIC Akola	2.04	2.78	3.01	6.47	0.24		3.15	G
	CIPC Chandrapur	3.11	2.86	3.13	6.89	1.82		3.15	G
	CADA Nagpur	0.83	0.93	3.16	2.14	0.20		3.15	VG
	CADA Jalgaon	2.30	3.45	3.71	10.00	0.64		3.15	VG
	NIC Nanded	2.81	3.24	4.91	5.72	1.04		3.15	VG
	PIC Pune	5.12	6.26	5.08	10.16	1.35		3.15	VG
	Surplus	CIPC Chandrapur	4.43	7.30	3.06	7.30		3.14	3.89
CADA Nagpur		3.78	4.76	4.71	18.60	0.12	4.05	VG	
Abundant	KIC Ratnagiri	0.52	0.78	0.33	0.78	0.30	2.23	5.40	BA
	TIC Thane	0.35	No Water	0.44	0.41	0.30		5.40	BA
	SIC Sangli	3.99	3.38	4.02	13.45	2.06		5.40	M
	CIPC Chandrapur	4.98	5.76	6.26	6.01	4.14		5.40	VG

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in red & blue excluded for Avg Per  
3) 'No Water' indicates reservoirs are not filled in that year.



### **Indicator – V: Cost Recovery Ratio**

- 1) In most of the projects under CADA Beed (highly deficit) water was not available during the year 2003-04. However, during 2004-05 due to availability of water the cost recovery ratio has increased.
- 2) Shahanoor project under AIC Akola (deficit) has achievement closer to the State target. Achievement on Mun project is better compared to State target. However, the overall performance of circle as a whole, is moderate.
- 3) There was no water available in Mandohol project in 2003-04 under CADA Nashik (normal) and O&M cost was 'nil' in Mandohol & Adhala projects in 2003-04. This has resulted in reduction in cost recovery ratio from 1.03 in 2003-04 to 0.21 in 2004-05.
- 4) In Dongargaon project under NIC Nanded (normal) non availability of water in 2004-05 has resulted in reducing the ratio for the circle from 1.07 in 2003-04 to 0.33 in 2004-05.
- 5) In case of Koradi project under AIC Akola (normal) lesser water availability for irrigation had an impact on the irrigation revenue recovery, bringing down the performance as compared to the past performance .
- 6) The cost recovery ratio in projects under PIC Pune (normal), has increased from 1.039 in 2003-04 to 2.20 in 2004-05 mainly due to increase in revenue in Mhaswad, Ranand (82 percent) and Wadiwale (62 percent) and decrease in O&M cost in Wadiwale project.
- 7) In case of Ghorazari project under CIPC Chandrapur (surplus) & Naleshwar project under CIPC Chandrapur (abundant), the ratio has been reduced. Due to execution of some unavoidable canal maintenance works, during 2004-05, has increased the O&M cost.

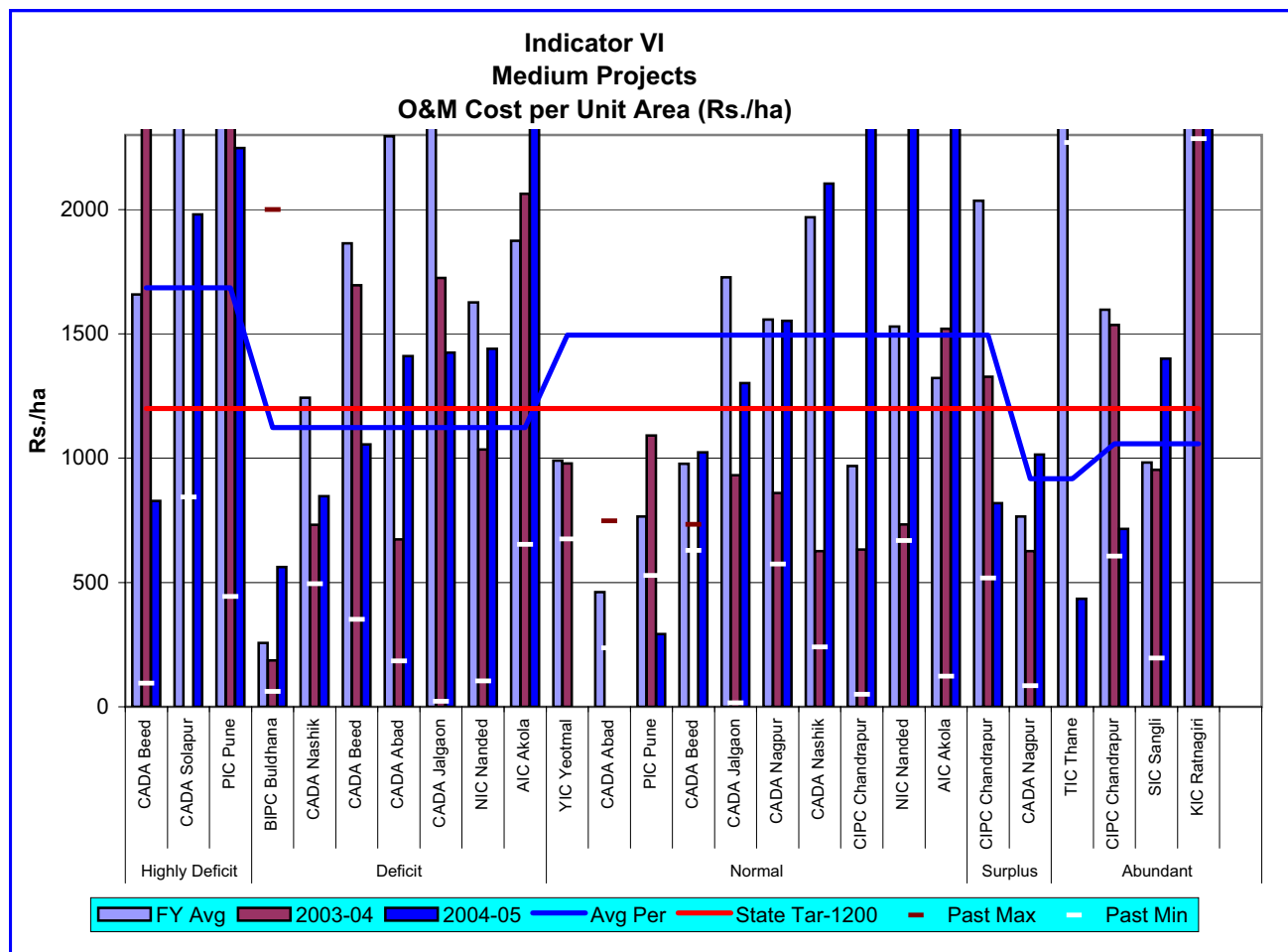


Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	PIC Pune	0.08	0.02	0.08	0.74	0.01	0.29	BA
	CADA Solapur	0.28	0.06	0.23	0.74	0.01		BA
	CADA Beed	0.43	0.18	0.35	4.95	0.01		BA
Deficit	CADA Nashik	0.16	0.36	0.20	0.59	0.01	0.67	BA
	CADA Jalgaon	0.16	0.27	0.26	8.69	0.01		BA
	AIC Akola	0.54	1.09	0.74	7.36	0.02		M
	NIC Nanded	0.27	0.56	0.84	3.75	0.02		M
	CADA Abad	0.13	0.63	0.90	3.00	0.01		G
	CADA Beed	0.77	1.17	1.08	17.92	0.01		VG
	BIPC Buldhana	1.86	4.19	3.29	5.65	0.35		VG
	Normal	YIC Yeotmal	0.02	0.07	No Water	0.07		0.01
CADA Nashik	0.26	1.03	0.21	2.05	0.03	BA		
CADA Jalgaon	0.33	0.46	0.32	43.50	0.02	BA		
NIC Nanded	0.25	1.07	0.33	1.46	0.01	BA		
AIC Akola	0.21	0.61	0.41	3.50	0.04	BA		
CADA Beed	0.43	No Water	0.44	1.17	0.27	BA		
CADA Abad	0.71	No Water	0.53	1.96	0.34	F		
CIPC Chandrapur	0.81	1.45	1.98	8.65	0.01	VG		
PIC Pune	1.32	1.39	2.20	2.70	0.02	VG		
CADA Nagpur	0.23	0.51	25.38	0.94	0.07	VG		
Surplus	CIPC Chandrapur	0.17	0.34	0.27	0.61	0.01	0.42	BA
	CADA Nagpur	0.22	0.40	0.57	2.78	0.00		F
Abundant	KIC Ratnagiri	0.06	0.12	0.09	0.17	0.01	0.47	BA
	TIC Thane	0.01	No Water	0.24	0.04	0.01		BA
	CIPC Chandrapur	0.20	0.23	0.33	0.54	0.10		BA
	SIC Sangli	0.61	0.70	0.83	1.74	0.16		M

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in red & blue excluded for Avg Per  
3) 'No Water' indicates reservoirs are not filled in that year.

**Indicator VI : O&M Cost per Unit Area**

- 1) The O&M cost per unit area in respect of projects under CADA Beed (highly deficit) is substantially reduced from Rs. 163111 (2003-04) to Rs. 828 (2004-05), due to irrigating on more area as per availability of water, during the year 2004-05.
- 2) The ratio in projects under PIC Pune (highly deficit) was very high during 2003-04, as there was no water available for irrigation in two out of three projects. However, the ratio for 2004-05 is reduced but it is still higher than the State target due to deferred payment of bills for work done in past.
- 3) In Karpara, Masoli, Girja, Gadadgad, Kalyan Girja, Dhamna, Jivrekha projects under CADA Aurangabad (deficit), the ratio has increased from 673 (2003-04) to 1411 (2004-05) due to lesser irrigation. In Lahuki, Ajintha Andhari, Kalyan and Jui irrigation is almost 'nil' due to non availability of water during 2004-05.
- 4) In CADA Jalgaon (normal) the O&M cost per unit area has increased 1.5 times as compared to last year. As reported by the field officers, this is due to non consideration of CRT staff expenditure on Suki & Abhora projects during 2003-04.
- 5) There is a threefold increase in O&M cost for projects viz. Adhala, Mandohol & Bhojapur under CADA Nashik (normal), due to reduction in irrigated area in Adhala & Bhojapur projects & non availability of water in Mandohol project.
- 6) Reduction in command area, due to lesser availability of water for irrigation in Dongargaon & Nagzari projects under NIC Nanded (normal), has resulted in increase in value by more than 7 times.
- 7) O&M cost per unit irrigated area on projects under AIC Akola (deficit and normal) is exceptionally high. Due to scarcity conditions water was available for irrigation only in Shahanoor project out of 8 projects under AIC Akola (deficit). In case of 5 projects under AIC Akola (normal), water was available for irrigation only in Koradi project. However, the O&M cost being indispensable and taken together for all the projects, the ratio under above plan group has risen to very high.
- 8) In Natuwadi project under KIC Ratnagiri (abundant), the O&M cost per unit area has increased nearly 10 times, as a result of carrying out deferred maintenance works on a large scale on distribution system during 2004-05.

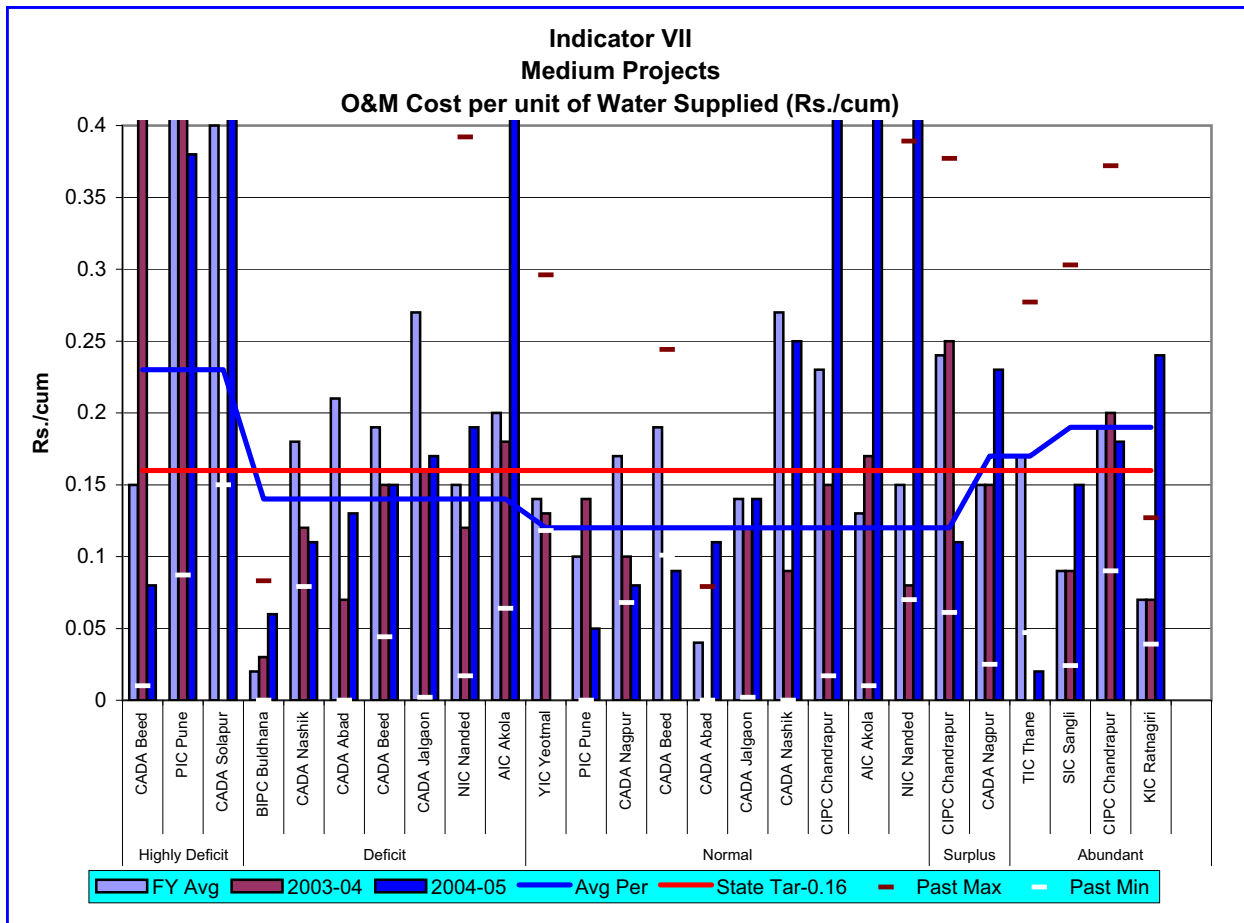


Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	1658	163111	828	11641	95	1686	F
	CADA Solapur	2878	No Water	1981	9582	843		BA
	PIC Pune	3632	197100	2248	6721	443		BA
Deficit	BIPC Buldhana	257	186	562	2000	61	1123	BA
	CADA Nashik	1243	732	847	6462	494		M
	CADA Beed	1864	1696	1055	15143	351		G
	CADA Abad	2295	673	1411	18566	184		BA
	CADA Jalgaon	2620	1725	1425	522667	22		BA
	NIC Nanded	1626	1035	1440	7804	104		BA
	AIC Akola	1875	2063	43825	22202	653		BA
Normal	YIC Yeotmal	990	979	No Water	2924	675	1495	---
	CADA Abad	461	No Water	No Water	748	236		---
	PIC Pune	765	1091	293	2586	528		BA
	CADA Beed	978	No Water	1023	733	629		G
	CADA Jalgaon	1727	932	1302	16276	15		BA
	CADA Nagpur	1557	860	1552	3949	574		BA
	CADA Nashik	1969	626	2105	10571	240		BA
	CIPC Chandrapur	968	632	3614	5741	50		BA
	NIC Nanded	1529	733	5475	4170	668		BA
	AIC Akola	1323	1521	16319	65364	123		BA
Surplus	CIPC Chandrapur	2036	1328	819	3437	518	917	F
	CADA Nagpur	766	626	1015	49525	84		M
Abundant	TIC Thane	7787	No Water	435	13606	2269	1058	BA
	CIPC Chandrapur	1597	1536	715	3465	606		F
	SIC Sangli	982	953	1401	3074	195		BA
	KIC Ratnagiri	5225	3381	32528	12237	2285		BA

Note:1) Figures in red indicate values exceeding range of graph.2) Figures in red & blue excluded for Avg Per63

### **Indicator VII : O&M Cost per unit Water Supplied**

- 1) The O&M cost per unit of water supplied in case of projects under CADA Beed (highly deficit) has been substantially reduced from 1.14 (2003-04) to 0.08 (2004-05), due to availability of water for irrigation during 2004-05.
- 2) The ratio on Mun and Torna projects under BIPC Buldhana (deficit) is low as compared to State target, due to less water utilisation for irrigation.
- 3) AIC Akola (deficit) has Gyanganga, Mas, Morna, Nirguna, Paldhag, Sonal, Uma & Shahanoor projects. As per the availability of water in reservoir, irrigation was possible only on Shahanoor project. The indispensable O&M expenditure on the remaining seven projects, taken together in consolidation with Shahanoor project, has led to overall increase in O&M cost per unit water supplied. Same is the case with the projects under AIC Akola (normal) i.e. Koradi, Lower Pus, Saikheda, Ekburji & Borgaon. Only Koradi project has limited irrigation on reservoir lift.
- 4) The ratio has increased by 2.5 times in case of CADA Nashik (normal), due to increase in O&M cost in both the projects viz. Mandohol and Adhala in 2004-05.
- 5) In case of NIC Nanded (normal) the O&M cost has increased by 11.5 times the value of 2003-04. This is attributable to payment of charges towards maintenance work carried out on Dongargaon project to mechanical wing.
- 6) The cost per unit water supplied on Ghorazari project under CIPC Chandrapur (normal) & Naleshwar project under CIPC Chandrapur (abundant) is close to the State target.



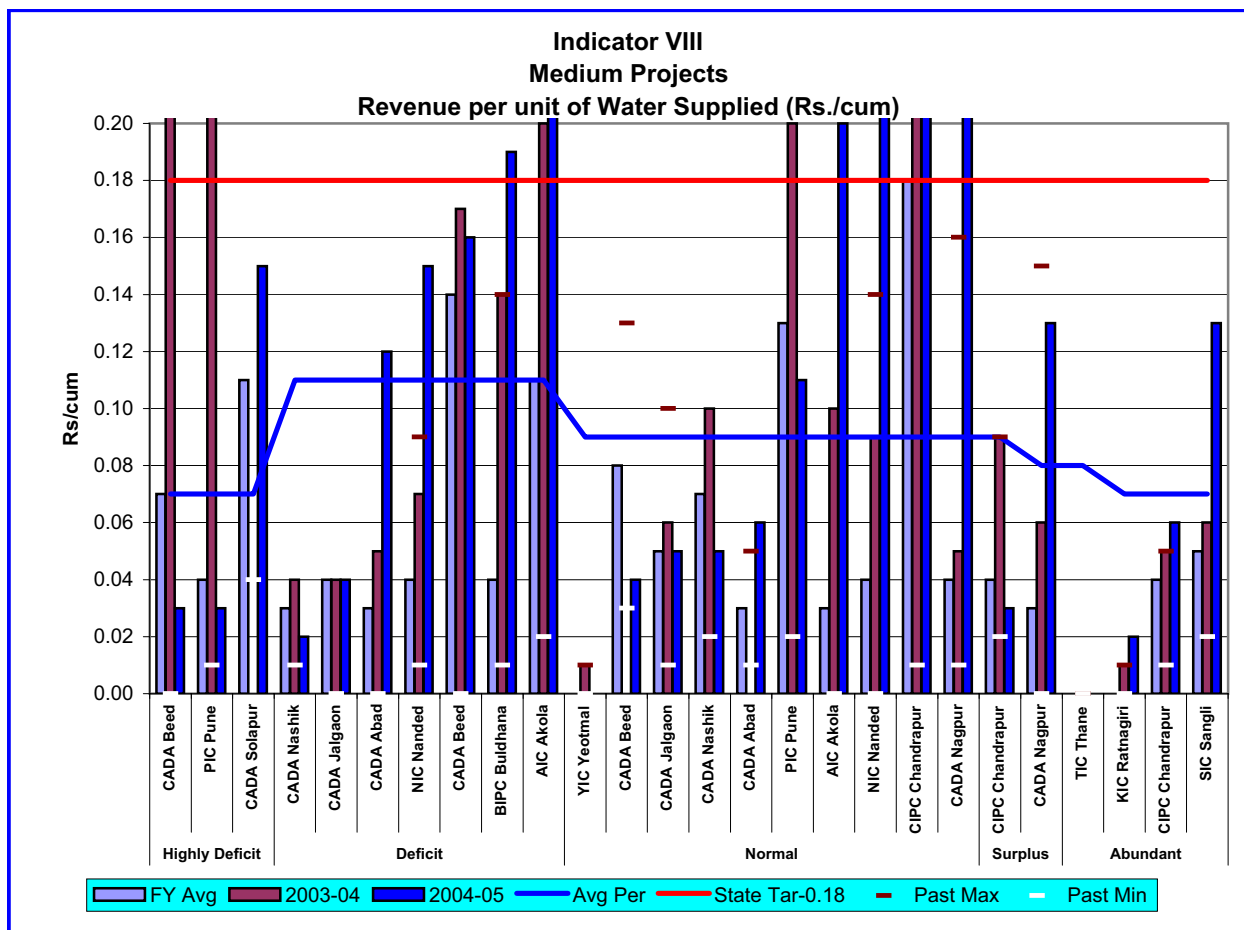
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank		
Highly Deficit	CADA Beed	0.15	1.14	0.08	3.73	0.01	0.23	F		
	PIC Pune	0.57	30.32	0.38	1.04	0.09		BA		
	CADA Solapur	0.40	No Water	0.62	26.16	0.15		BA		
Deficit	BIPC Buldhana	0.02	0.03	0.06	0.08	0.01	0.14	BA		
	CADA Nashik	0.18	0.12	0.11	5.15	0.08		F		
	CADA Abad	0.21	0.07	0.13	2.48	0.01		M		
	CADA Beed	0.19	0.15	0.15	2.33	0.04		G		
	CADA Jalgaon	0.27	0.16	0.17	96.23	0.01		BA		
	NIC Nanded	0.15	0.12	0.19	0.39	0.02		BA		
	AIC Akola	0.20	0.18	1.03	5.07	0.06		BA		
	YIC Yeotmal	0.14	0.13	No Water	0.30	0.12		---		
Normal	PIC Pune	0.10	0.14	0.05	1.70	0.01	0.12	BA		
	CADA Nagpur	0.17	0.10	0.08	0.85	0.07		BA		
	CADA Beed	0.19	No Water	0.09	0.24	0.10		F		
	CADA Abad	0.04	No Water	0.11	0.08	0.01		F		
	CADA Jalgaon	0.14	0.12	0.14	1.83	0.01		G		
	CADA Nashik	0.27	0.09	0.25	1.46	0.01		BA		
	CIPC Chandrapur	0.23	0.15	0.44	0.83	0.02		BA		
	AIC Akola	0.13	0.17	0.49	0.71	0.01		BA		
	NIC Nanded	0.15	0.08	0.92	0.39	0.07		BA		
	Surplus	CIPC Chandrapur	0.24	0.25	0.11	0.38		0.06	0.17	F
		CADA Nagpur	0.15	0.15	0.23	1.29		0.03		BA
Abundant	TIC Thane	0.17	No Water	0.02	0.28	0.05	0.19	BA		
	SIC Sangli	0.09	0.09	0.15	0.30	0.02		G		
	CIPC Chandrapur	0.19	0.20	0.18	0.37	0.09		BA		
	KIC Ratnagiri	0.07	0.07	0.24	0.13	0.04		BA		

Note:1) Figures in red indicate values exceeding range of graph.

2) Figures in red & blue excluded for Avg.Per. 3) 'No Water' indicates reservoirs are not filled.

### **Indicator VIII : Revenue per unit Water Supplied**

- 1) Revenue per unit of water supplied in case of projects under CADA Beed (highly deficit) is reduced from Rs. 0.21 (2003-04) to Rs. 0.03 (2004-05) due to increase in water utilisation by nearly 10 times in 2004-05 and reduction in recovery, which should have rather increased.
- 2) In spite of increase in revenue by more than 5 times in all the three projects under PIC Pune (highly deficit), the ratio has come down from 0.56 in 2003-04 to 0.03 in 2004-05 due to considerable increase in water use for bringing more area under irrigation.
- 3) The ratio decreased to 50 percent of values for 2003-04 in case of projects under CADA Nashik (deficit & normal) due to less recovery in Haranbari & Kelzar projects & negligible recovery in Nagyasakya project in 2004-05. Similarly, less recovery in Alandi & Bhojapur projects contributed to reduction in value.
- 4) In case of projects under CADA Aurangabad (deficit) the revenue recovery was nearly 50 percent of total utilisation in 2003-04 whereas in 2004-05 it was 81 percent resulting in increased value.
- 5) Revenue per unit water supplied on projects under BIPC Buldhana (deficit), and AIC Akola (deficit & normal) is appreciable due to efforts taken to realize the recovery.
- 6) In case of NIC Nanded (normal) the ratio during 2004-05 has increased more than three times due to efforts taken for recovery of water charges at all levels resulting in crossing the State target. (Total utilisation 2.39 Mcum, total recovery 7.3 lakhs)
- 7) Revenue recovery per unit water supplied on Ghorazari project under CIPC Chandrapur (surplus) & Naleshwar under CIPC Chandrapur (abundant) is low as compared to State target. According to field officers justification poor response to remittance of irrigation revenue by the farmers is the main cause in low recovery of water charges for irrigation use.
- 8) In Wandri project under TIC Thane (abundant), the ratio is less in 2004-05 and past also. Improvement in WUE is required so as to enhance the revenue.



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	0.07	0.21	0.03	0.64	No Water	0.07	BA
	PIC Pune	0.04	0.56	0.03	0.28	0.01		BA
	CADA Solapur	0.11	No Water	0.15	0.59	0.04		M
Deficit	CADA Nashik	0.03	0.04	0.02	0.86	0.01	0.11	BA
	CADA Jalgaon	0.04	0.04	0.04	0.27	No Water		BA
	CADA Abad	0.03	0.05	0.12	0.46	No Water		F
	NIC Nanded	0.04	0.07	0.15	0.09	0.01		M
	CADA Beed	0.14	0.17	0.16	3.42	No Water		G
	BIPC Buldhana	0.04	0.14	0.19	0.14	0.01		VG
	AIC Akola	0.11	0.20	0.76	0.68	0.02		VG
Normal	YIC Yeotmal	No Water	0.01	No Water	0.01	No Water	0.09	---
	CADA Beed	0.08	No Water	0.04	0.13	0.03		BA
	CADA Jalgaon	0.05	0.06	0.05	0.10	0.01		BA
	CADA Nashik	0.07	0.10	0.05	0.29	0.02		BA
	CADA Abad	0.03	No Water	0.06	0.05	0.01		BA
	PIC Pune	0.13	0.20	0.11	0.35	0.02		F
	AIC Akola	0.03	0.10	0.20	0.55	No Water		VG
	NIC Nanded	0.04	0.09	0.31	0.14	No Water		VG
	CIPC Chandrapur	0.18	0.22	0.88	1.32	0.01		VG
	CADA Nagpur	0.04	0.05	2.10	0.16	0.01		VG
Surplus	CIPC Chandrapur	0.04	0.09	0.03	0.09	0.02	0.08	BA
	CADA Nagpur	0.03	0.06	0.13	0.15	No Water		F
Abundant	TIC Thane	No Water	No Water	0.04	No Water	No Water	0.07	BA
	KIC Ratnagiri	No Water	0.01	0.02	0.01	No Water		BA
	CIPC Chandrapur	0.04	0.05	0.06	0.05	0.01		BA
	SIC Sangli	0.05	0.06	0.13	0.36	0.02		F

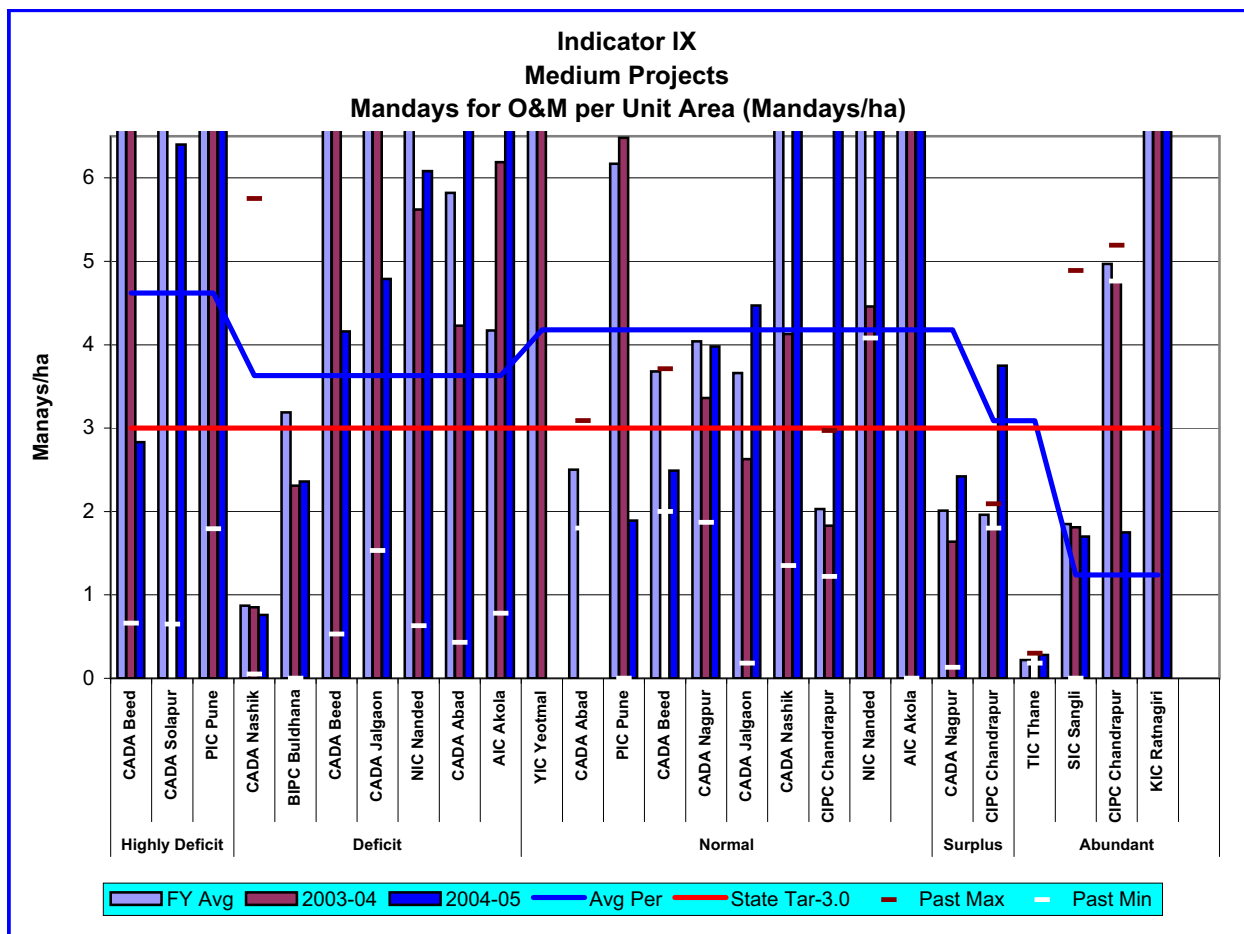
Note: 1) Figures in red indicate values exceeding range of graph.

2) Figures in red & blue excluded for Avg Per. 3) 'No Water' indicates reservoirs are are not filled.



**Indicator IX : Mandays for O&M per Unit Area**

- 1) In CADA, Solapur (highly deficit), mandays for O&M per unit area are reduced compared to FY average due to reduction in mandays in Ekrukh and Hingni (P) due to transfer and retirement of 38 persons.
- 2) Mandays for O&M per unit area for projects under CADA Beed (deficit) is reduced from 9.84 (2003-04) to 4.16 (2004-05) due to increased irrigation & retirement of CRT staff.
- 3) Mandays per unit area under CADA Jalgaon (deficit) is reduced by about 50 percent mainly due to increase in irrigated area (2004-05) in Manyad, Bori & Rangavali projects.
- 4) Lesser irrigation & mandays remaining unaltered in 2004-05 in projects namely Karpara, Masoli, Girja, Kalyan Girja & no irrigation in projects namely Ajintha Andhari, Kalyan & Jui under CADA Aurangabad (deficit) has resulted in increasing ratio nearly three times the value for the year 2003-04.
- 5) Mandays for O&M per unit area on projects under AIC Akola (deficit & normal) are very high compared to the State target. No irrigation was possible on 11 projects out of 13 under AIC Akola (deficit & normal) due to scarcity conditions in 2004-05. Due to indispensable O&M expenditure, the value appears to be very high.
- 6) The ratio under CADA Nashik (normal) is doubled due to reduction in area irrigated in 2004-05 in Alandi & Bhojapur projects and canal cleaning work being done by mechanical organization in Adhala project resulting in increase in mandays for irrigation.
- 7) Twenty three persons are transferred to NRBC (Major project) and other K T Weirs (Minor project) in PIC Pune (normal), thereby improving overall performance to very good.
- 8) The ratio is 10.55 for projects under CIPC Chandrapur (normal) due to unavoidable repairs carried out to the canal system.
- 9) The mandays in respect of Dongargaon project under NIC Nanded (normal) has increased nearly 2.5 times the value for 2003-04 due to lesser irrigation & increase in the CRT staff due to transfer from other projects.
- 10) Mandays per ha in Natuwadi project under KIC Ratnagiri (abundant) is reduced compared to past. Still the ratio is very high. It has to be reduced by bringing more area under irrigation. Presently, only 180 hectares are irrigated out of created potential of 2050 ha.



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	7.69	1018.52	2.83	66.67	0.66	4.62	VG
	CADA Solapur	11.64	No Irr	6.40	30.41	0.65		BA
	PIC Pune	9.20	376.08	13.00	36.50	1.79		BA
Deficit	CADA Nashik	0.87	0.85	0.76	5.75	0.05	3.63	VG
	BIPC Buldhana	3.19	2.31	2.36	24.80	0.00		VG
	CADA Beed	7.89	9.84	4.16	57.09	0.53		F
	CADA Jalgaon	8.85	8.95	4.79	1825.00	1.53		BA
	NIC Nanded	14.24	5.62	6.08	80.69	0.63		BA
	CADA Abad	5.82	4.23	11.37	29.34	0.43		BA
	AIC Akola	4.17	6.19	53.91	82.25	0.78		BA
Normal	YIC Yeotmal	19.86	19.00	No Irr	58.00	14.00	4.18	---
	CADA Abad	2.50	No Irr	No Irr	3.09	1.80		---
	PIC Pune	6.17	6.48	1.89	17.49	0.00		VG
	CADA Beed	3.68	No Irr	2.49	3.71	2.00		VG
	CADA Nagpur	4.04	3.36	3.98	13.83	1.87		F
	CADA Jalgaon	3.66	2.63	4.47	16.07	0.18		F
	CADA Nashik	7.03	4.13	8.08	75.31	1.35		BA
	CIPC Chandrapur	2.03	1.83	10.55	2.97	1.22		BA
	NIC Nanded	12.52	4.46	11.94	47.60	4.08		BA
	AIC Akola	8.97	13.27	31.24	79.00	0.00		BA
Surplus	CADA Nagpur	2.01	1.64	2.42	91.25	0.13	3.09	VG
	CIPC Chandrapur	1.96	1.80	3.75	2.09	1.80		M
Abundant	TIC Thane	0.22	No Irr	0.28	0.30	0.18	1.24	VG
	SIC Sangli	1.85	1.81	1.70	4.89	0.00		VG
	CIPC Chandrapur	4.97	4.76	1.75	5.19	4.76		VG
	KIC Ratnagiri	25.39	24.38	21.67	28.06	24.38		BA

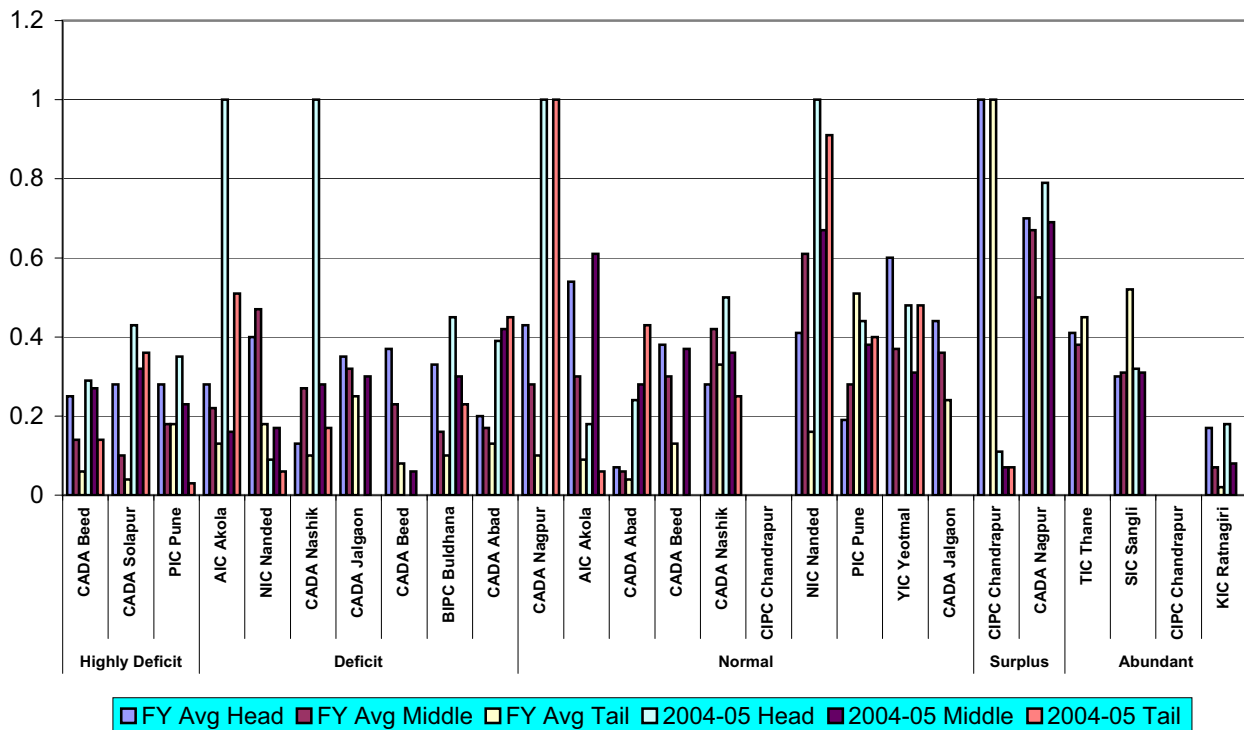
Note: 1) Figures in red indicate values exceeding range of graph.

2) Figures in red & blue excluded for Avg Per. 3) "No Irr." indicates no irrigation in that year.

**Indicator XI: Equity Performance**

CADA Aurangabad (deficit) and PIC Pune (normal) distributed water nearly equitably to head, middle and tail reach farmers.

**Indicator XI  
Medium projects  
Equity Performance**

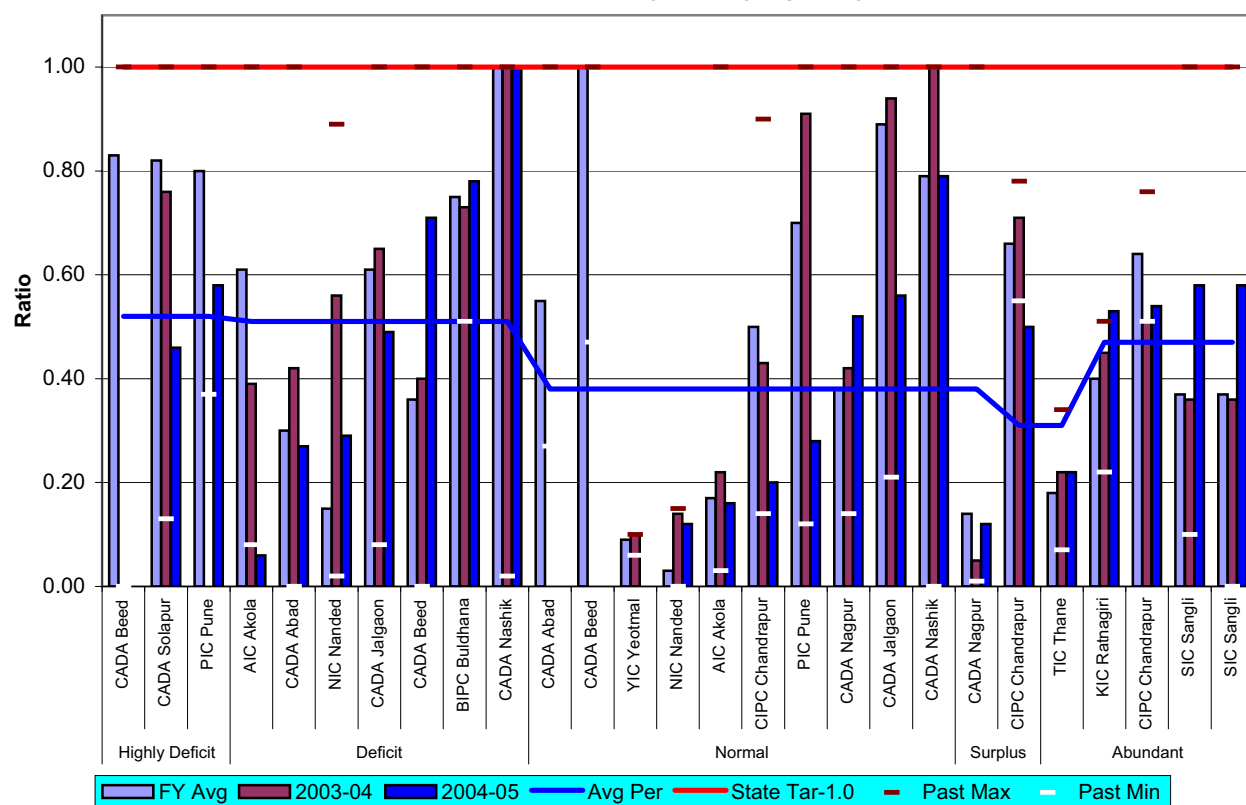


Plangroup	Circle	FY Avg			2004-05		
		Head	Middle	Tail	Head	Middle	Tail
Highly Deficit	CADA Beed	0.25	0.14	0.06	0.29	0.27	0.14
	CADA Solapur	0.28	0.10	0.04	0.43	0.32	0.36
	PIC Pune	0.28	0.18	0.18	0.35	0.23	0.03
Deficit	AIC Akola	0.28	0.22	0.13	1.00	0.16	0.51
	NIC Nanded	0.40	0.47	0.18	0.09	0.17	0.06
	CADA Nashik	0.13	0.27	0.10	1.00	0.28	0.17
	CADA Jalgaon	0.35	0.32	0.25	0.00	0.30	0.00
	CADA Beed	0.37	0.23	0.08	0.00	0.06	0.00
	BIPC Buldhana	0.33	0.16	0.10	0.45	0.30	0.23
	CADA Abad	0.20	0.17	0.13	0.39	0.42	0.45
Normal	CADA Nagpur	0.43	0.28	0.10	1.00	0.00	1.00
	AIC Akola	0.54	0.30	0.09	0.18	0.61	0.06
	CADA Abad	0.07	0.06	0.04	0.24	0.28	0.43
	CADA Beed	0.38	0.30	0.13	0.00	0.37	0.00
	CADA Nashik	0.28	0.42	0.33	0.50	0.36	0.25
	CIPC Chandrapur	0.00	0.00	0.00	0.00	0.00	0.00
	NIC Nanded	0.41	0.61	0.16	1.00	0.67	0.91
	PIC Pune	0.19	0.28	0.51	0.44	0.38	0.40
	YIC Yeotmal	0.60	0.37	0.00	0.48	0.31	0.48
CADA Jalgaon	0.44	0.36	0.24	0.00	0.00	0.00	
Surplus	CIPC Chandrapur	1.00	0.00	1.00	0.11	0.07	0.07
	CADA Nagpur	0.70	0.67	0.50	0.79	0.69	0.00
Abundant	TIC Thane	0.41	0.38	0.45	0.00	0.00	0.00
	SIC Sangli	0.30	0.31	0.52	0.32	0.31	0.00
	CIPC Chandrapur	0.00	0.00	0.00	0.00	0.00	0.00
	KIC Ratnagiri	0.17	0.07	0.02	0.18	0.08	0.00

**Indicator XII (I) : Assessment Recovery Ratio (Irrigation)**

- 1) The performance of CADA Solapur (highly deficit) is declined over last year. Efforts are required to improve the performance.
- 2) Irrigation revenue recovery in projects under AIC Akola (deficit), CIPC Chandrapur (normal) & CADA Nagpur (surplus) is quite low due to ill response from farmers towards remittance of water charges for irrigation use.
- 3) Increase in irrigation recovery in Terna, Raigavan, Sakol, Whati, Tiru and Devarjan projects under CADA Beed (deficit) has resulted in increased ratio during 2004-05.
- 4) Projects under BIPC Buldhana (deficit), CADA Nagpur (normal) and CIPC Chandrapur (abundant) have revenue realization more than 50 percent of the assessment.
- 5) The projects under CADA Nashik (deficit) have maintained the ratio to State target in 2003-04 and 2004-05.
- 6) Performance of PIC Pune (normal) is declined over last year. Efforts are required to improve the same.
- 7) Less recovery in Abhora and Karvand projects compared with assessment in 2004-05 and reduction in ratio in Aner and Panzra projects under CADA Jalgaon (normal) has effected in reduction in assessment recovery ratio. Efforts are required by the field officers to enhance it.
- 8) Reduction in the values in Alandi and Bhojapur projects under CADA Nashik (normal) has contributed to reduction in the ratio in 2004-05. Efforts are required by the field officers to enhance it.

**Indicator XII-I  
Medium Projects  
Assessment Recovery Ratio (Irrigation)**



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	0.83	No Irr	No Irr	1.00	0.01	0.52	---
	CADA Solapur	0.82	0.76	0.46	1.00	0.01		BA
	PIC Pune	0.80	No Irr	0.58	1.00	0.01		F
Deficit	AIC Akola	0.61	0.39	0.06	1.00	0.01	0.51	BA
	CADA Abad	0.30	0.42	0.27	1.00	0.01		BA
	NIC Nanded	0.15	0.56	0.29	0.89	0.02		BA
	CADA Jalgaon	0.61	0.65	0.49	1.00	0.08		BA
	CADA Beed	0.36	0.40	0.71	1.00	0.01		M
	BIPC Buldhana	0.75	0.73	0.78	1.00	0.01		M
	CADA Nashik	1.00	1.00	1.00	1.00	0.01		VG
	CADA Abad	0.55	No Irr	No Irr	1.00	0.01		---
Normal	CADA Beed	1.00	No Irr	No Irr	1.00	0.01	---	
	YIC Yeotmal	0.09	0.10	No Irr	0.10	0.01	---	
	NIC Nanded	0.03	0.14	0.12	0.15	0.01	BA	
	AIC Akola	0.17	0.22	0.16	1.00	0.01	BA	
	CIPC Chandrapur	0.50	0.43	0.20	0.90	0.01	BA	
	PIC Pune	0.70	0.91	0.28	1.00	0.01	BA	
	CADA Nagpur	0.38	0.42	0.52	1.00	0.01	F	
	CADA Jalgaon	0.89	0.94	0.56	1.00	0.21	F	
	CADA Nashik	0.79	1.00	0.79	1.00	0.01	M	
	Surplus	CADA Nagpur	0.14	0.05	0.12	1.00	0.01	0.31
CIPC Chandrapur		0.66	0.71	0.50	0.78	0.01	F	
Abundant	TIC Thane	0.18	0.22	0.22	0.34	0.07	0.47	BA
	KIC Ratnagiri	0.40	0.45	0.53	0.51	0.22		F
	CIPC Chandrapur	0.64	0.51	0.54	0.76	0.01		F
	SIC Sangli	0.37	0.36	0.58	1.00	0.10		F

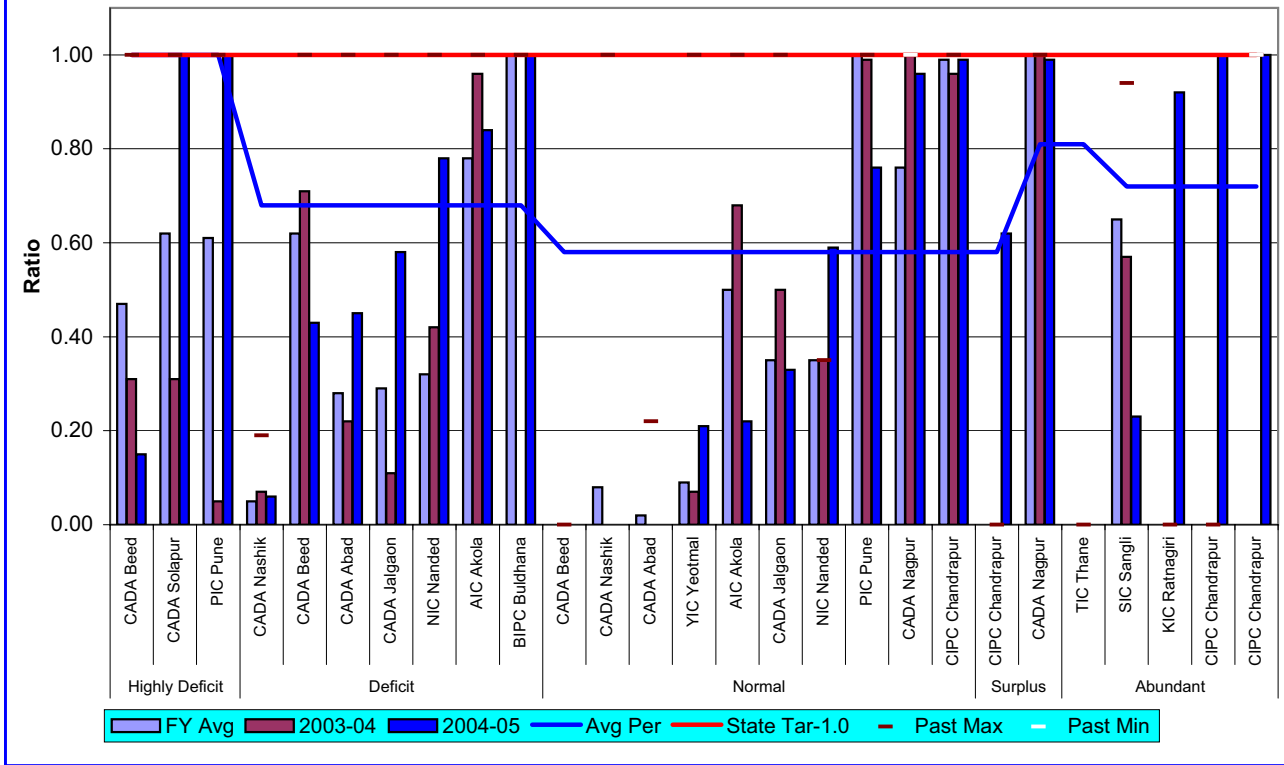
Note:1) 'No irr' indicates no irrigation in that year.

### **Indicator XII (NI) : Assessment Recovery Ratio (Non-Irrigation)**

- 1) CADA Solapur and PIC Pune (highly deficit) have improved appreciably over their past performance.
- 2) The assessment recovery ratio (NI) in projects under CADA Abad (deficit) has doubled due to efforts taken in recovery at all levels in Galati, Khelna and Ajintha Andhari projects.
- 3) The increase in recovery in Bori, Kanoli, Rangavali projects under CADA Jalgaon (deficit) has contributed in increasing the ratio during 2004-05 nearly five times the value for 2003-04.
- 4) No recovery in Abhora and Aner projects and reduction in recovery compared to assessment in Karvand project has resulted in decrease in the value of the ratio during 2004-05 in CADA Jalgaon (normal)
- 5) KIC Ratnagiri (abundant) have improved appreciably over their past performance.

Revenue recovery for non irrigation use on all projects in Amravati and Nagpur regions except projects under YIC Yeotmal (normal), AIC Akola (normal) and CIPC Chandrapur (surplus) is above 80 percent.

**Indicator XII-NI  
Medium Projects  
Assessment Recovery Ratio (Non -Irrigation)**



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	0.47	0.31	0.15	1.00	0.01	1.00	BA
	CADA Solapur	0.62	0.31	1.00	1.00	0.01		VG
	PIC Pune	0.61	0.05	1.00	1.00	0.01		VG
Deficit	CADA Nashik	0.05	0.07	0.06	0.19	0.01	0.68	BA
	CADA Beed	0.62	0.71	0.43	1.00	0.01		BA
	CADA Abad	0.28	0.22	0.45	1.00	0.00		BA
	CADA Jalgaon	0.29	0.11	0.58	1.00	0.01		F
	NIC Nanded	0.32	0.42	0.78	1.00	0.01		M
	AIC Akola	0.78	0.96	0.84	1.00	0.01		M
	BIPC Buldhana	1.00	No Recov	1.00	1.00	0.01		VG
Normal	CADA Beed	No Recov	No Recov	No Recov	0.01	0.01	0.58	---
	CADA Nashik	0.08	No Recov	No Recov	1.00	0.01		---
	CADA Abad	0.02	No Recov	No Recov	0.22	0.01		---
	YIC Yeotmal	0.09	0.07	0.21	0.01	0.01		BA
	AIC Akola	0.50	0.68	0.22	1.00	0.01		BA
	CADA Jalgaon	0.35	0.50	0.33	1.00	0.01		BA
	NIC Nanded	0.35	0.35	0.59	0.35	0.01		F
	PIC Pune	1.00	0.99	0.76	1.00	0.01		M
	CADA Nagpur	0.76	1.00	0.96	1.00	1.00		G
	CIPC Chandrapur	0.99	0.96	0.99	1.00	0.01		G
Surplus	CIPC Chandrapur	No Recov	No Recov	0.62	No Irr	0.01	0.81	F
	CADA Nagpur	1.00	1.00	0.99	1.00	0.01		G
Abundant	TIC Thane	No Recov	No Recov	No Recov	No Irr	0.01	0.72	---
	SIC Sangli	0.65	0.57	0.23	0.01	0.01		BA
	KIC Ratnagiri	No Recov	No Recov	0.92	No Irr	0.01		G
	CIPC Chandrapur	No Recov	No Recov	1.00	No Irr	0.01		VG

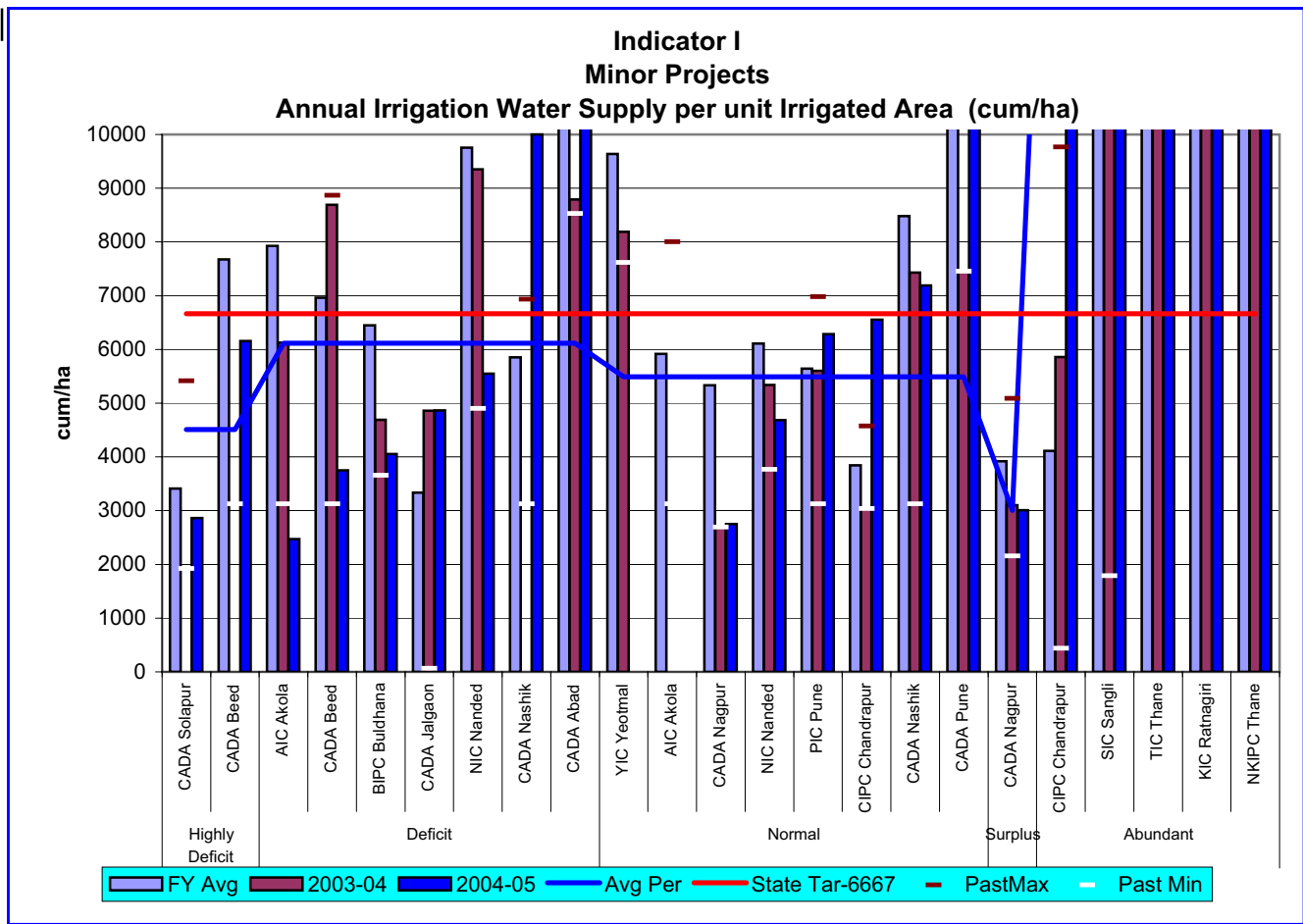
Note: 1) Figures in blue excluded for Avg Per 2) 'No irr' indicates no irrigation in that year.



## Minor Projects

### Indicator I: Annual irrigation water supply per unit irrigated area

- 1) In CADA Solapur (highly deficit) only 2.5 percent & 6.5 percent water was available in Pathri & Mangi projects respectively. There was no irrigation in Pathri and protective irrigation could be provided to 487ha out of created potential of 3117 ha in Mangi.
- 2) Under deficit plan group, AIC Akola has four minor irrigation projects, viz. Shekdari, Jamwadi, Singdoh, & Ancharwadi. Of these, only Shekdari (56 percent) and Jamwadi (37.5 percent) had cognizable live storage in spite of scarcity condition during the year 2004-05. Water use per ha on these two projects is lower than State target due to stress irrigation & drip irrigation on Shekdari project.
- 3) The annual irrigation water supply per unit irrigated area in respect of projects under CADA Beed (deficit), has been reduced from 8694 cum/ha (2003-04) to 3751 cum/ha (2004-05) due to lesser availability of water and protective irrigation in all the 3 projects in 2004-05.
- 4) Karadi & Vidrupa projects under BIPC Buldhana (deficit) also have low water use per unit area irrigated, as most of the area irrigated is on reservoir lift.
- 5) Improvement in water use efficiency in projects under NIC Nanded (deficit) from 106 ha/Mcum (2003-04) to 180 ha/Mcum (2004-05) resulted in reduction in the ratio.
- 6) Water availability in Kuttarwadi project under CADA Nashik (deficit) was nil during 2003-04 whereas it was 42 percent of live storage in 2004-05, therefore 61 ha has been irrigated, moreover WUE was less, hence the value is more.
- 7) The reduction in WUE in Tandulwadi project under CADA Aurangabad (deficit) from 114 ha/Mcum (2003-04) to 98 ha/Mcum (2004-05) has resulted in increase in the ratio.
- 8) WUE in Thoseghar project under CADA Pune (normal) is reduced from 134 ha/Mcum to 52 ha/Mcum, increasing the annual irrigation water supply per unit irrigated area. Due attention is required from field officers in this respect.
- 9) In projects under CIPC Chandrapur (normal), water use per ha on Bhatala is 6586 cum, close to the State target. However, water use on Lagan & Ashti is 12267 & 8824 cum respectively. More transit losses on account of deteriorated canal system, scattered area under irrigation are the reasons for more water use on these projects.
- 10) The ratio has slightly come down in projects under TIC Thane (abundant) due to improvement in WUE in Bhoj, Khandpe, Mohakhurd and Pabhare projects. Still there is scope for improvement.
- 11) In Shirwal project under KIC Ratnagiri (abundant), the ratio increased from 18172 to 23978 cum/ha in 2004-05 as the water use efficiency has come down to 42 ha/Mcum. Normally it ranged between 54 to 66 ha/Mcum in last five years. Efforts are required by field officers to increase the WUE, at least upto projected figures.
- 12) In projects under NKIPC Thane (abundant), the water use has increased from 29688 to 37798 cum per ha. This is mainly due to reduced water use efficiency in both Dhasai and Panchnadi projects. Efforts are required to improve the same.



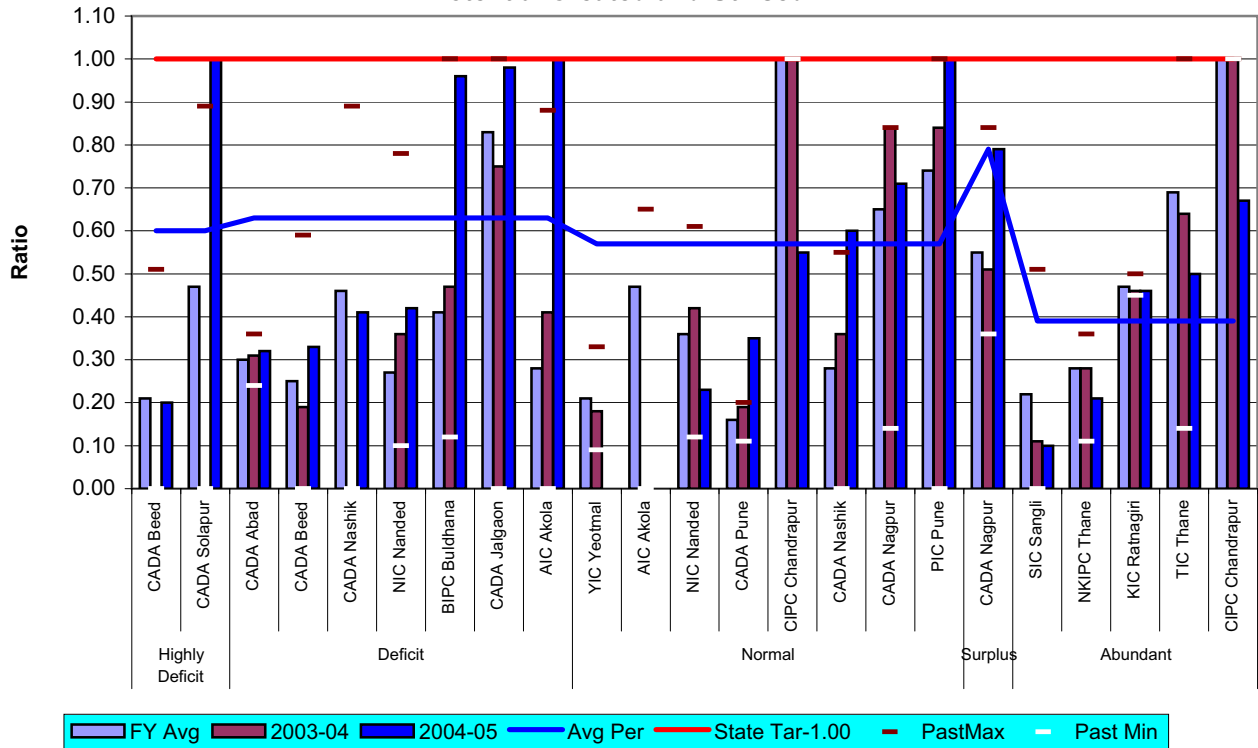
Plangroup	Circle	FY Avg	2003-04	2004-05	PastMax	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	3411	No Water	2864	5415	1922	4511	BA
	CADA Beed	7673	No Water	6157	14210	3125		VG
Deficit	AIC Akola	7928	6128	2472	13426	3125	6117	BA
	CADA Beed	6963	8694	3751	8869	3125		F
	BIPC Buldhana	6449	4693	4051	29130	3658		F
	CADA Jalgaon	3335	4861	4866	18718	65		M
	NIC Nanded	9753	9350	5549	26194	4898		M
	CADA Nashik	5855	No Water	10000	6932	3125		F
	CADA Abad	10261	8792	10130	13885	8529		BA
Normal	YIC Yeotmal	9636	8190	No Water	22000	7618	5492	---
	AIC Akola	5919	No Water	No Water	8000	3125		---
	CADA Nagpur	5334	2692	2749	27368	2692		BA
	NIC Nanded	6109	5339	4686	10827	3769		M
	PIC Pune	5643	5600	6283	6982	3125		VG
	CIPC Chandrapur	3844	3039	6552	4571	3039		VG
	CADA Nashik	8483	7429	7190	12308	3125		VG
CADA Pune	12534	7451	19180	16897	7451	BA		
Surplus	CADA Nagpur	3922	3101	3006	5085	2156	3006	BA
Abundant	CIPC Chandrapur	4110	5856	10335	9766	440	22992	BA
	SIC Sangli	11638	19476	19153	19476	1786		BA
	TIC Thane	26086	24866	23696	48065	13226		BA
	KIC Ratnagiri	17463	18172	23978	18526	15111		BA
	NKIPC Thane	26209	29688	37798	32122	22702		BA

Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in blue excluded for Avg Per

## **Indicator II: Potential Created and Utilised**

- 1) In projects under CADA Solapur (highly deficit) though ratio is 1.00, only one protective irrigation could be given as the water availability was only 6.5 percent
- 2) In Koshtewadi & Panshewadi projects under NIC Nanded (deficit), the increased irrigation resulted in enhancing the ratio from 0.36 to 0.42.
- 3) Due to introduction of drip irrigation on Shekdari project under AIC Akola (deficit) and lift irrigation on Karadi project under BIPC Buldhana (deficit), the potential utilisation on these projects is 1.00 & 0.96 respectively.
- 4) The ratio has increased from 0.75 (2003-04) to 0.98 (2004-05) due to increased irrigation on Dudhkheda, Hatgaon-1 & Wahala-1 projects under CADA Jalgaon (deficit).
- 5) In projects under PIC Pune (normal), the ratio has gone up from 0.74 in 2003-04 to 1.00 in 2004-05. This is mainly due to irrigating more area (4482 ha against 1887 ha. planned) in Rahu Project and this trend (irrigating more area than planned) is observed since 2003-04. The utilization in this project is required to be studied in detail.
- 6) Potential utilisation on projects under CIPC Chandrapur (abundant) is 0.67 due to more transit losses in the canal system.

**Indicator II  
Minor Projects  
Potential Created and Utilised**

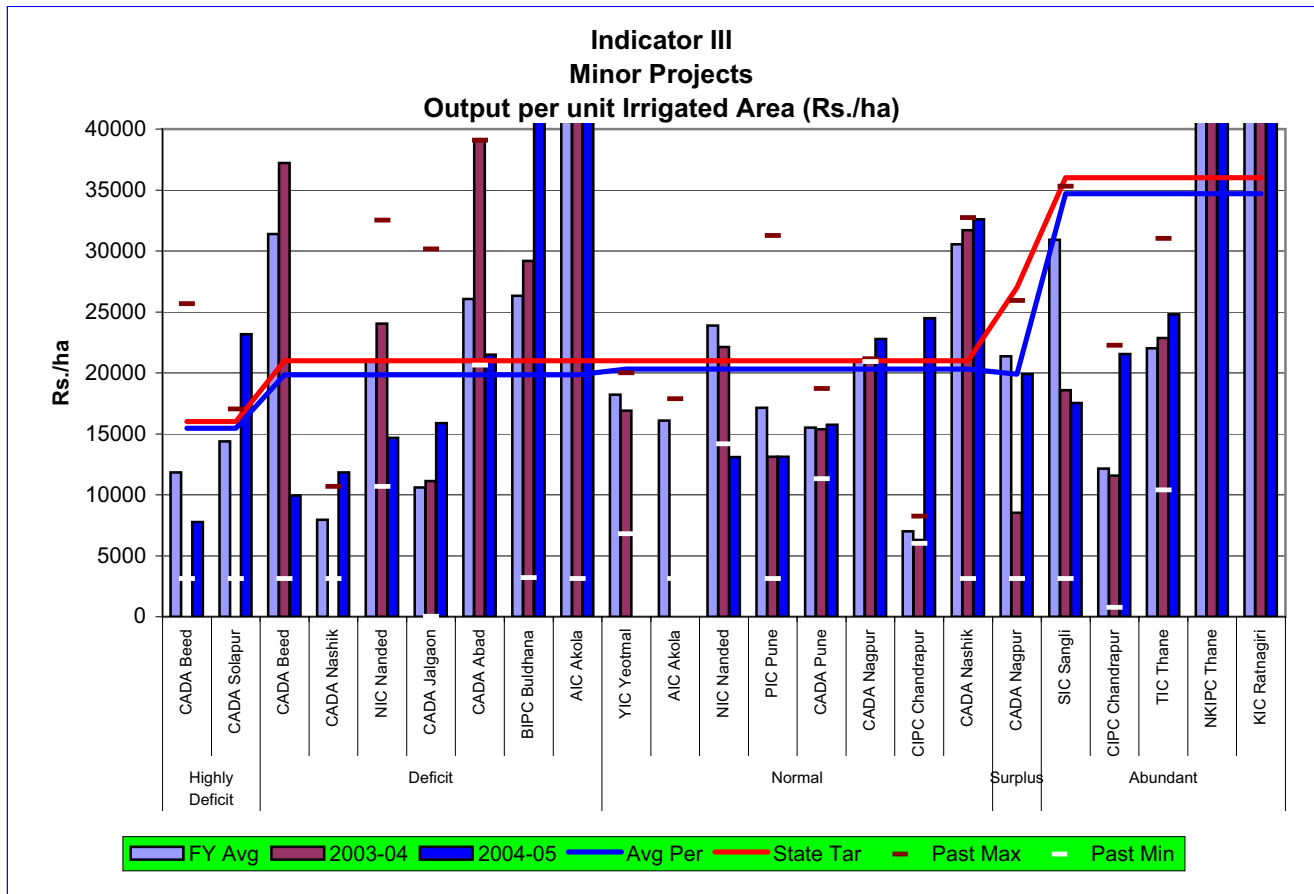


Plangroup	Circle	FY Avg	2003-04	2004-05	PastMax	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	0.21	No Irr	0.20	0.51	0.01	0.60	BA
	CADA Solapur	0.47	No Irr	1.00	0.89	0.03		VG
Deficit	CADA Abad	0.30	0.31	0.32	0.36	0.24	0.63	BA
	CADA Beed	0.25	0.19	0.33	0.59	0.04		BA
	CADA Nashik	0.46	No Irr	0.41	0.89	0.02		BA
	NIC Nanded	0.27	0.36	0.42	0.78	0.10		BA
	BIPC Buldhana	0.41	0.47	0.96	1.00	0.12		G
	CADA Jalgaon	0.83	0.75	0.98	1.00	0.03		G
	AIC Akola	0.28	0.41	1.00	0.88	0.04		VG
	Normal	YIC Yeotmal	0.21	0.18	No Irr	0.33		0.09
AIC Akola		0.47	No Irr	No Irr	0.65	0.05	---	
NIC Nanded		0.36	0.42	0.23	0.61	0.12	BA	
CADA Pune		0.16	0.19	0.35	0.20	0.11	BA	
CIPC Chandrapur		1.00	1.00	0.55	1.00	1.00	F	
CADA Nashik		0.28	0.36	0.60	0.55	0.02	F	
CADA Nagpur		0.65	0.84	0.71	0.84	0.14	M	
PIC Pune		0.74	0.84	1.00	1.00	0.06	VG	
Surplus	CADA Nagpur	0.55	0.51	0.79	0.84	0.36	0.79	M
Abundant	SIC Sangli	0.22	0.11	0.10	0.51	0.05	0.39	BA
	NKIPC Thane	0.28	0.28	0.21	0.36	0.11		BA
	KIC Ratnagiri	0.47	0.46	0.46	0.50	0.45		BA
	TIC Thane	0.69	0.64	0.50	1.00	0.14		F
	CIPC Chandrapur	1.00	1.00	0.67	1.00	1.00		F

Note:1) Figures in red indicate values exceeding range of graph  
2) Figures in red & blue excluded for Avg Per

### **Indicator III : Output per unit Irrigated Area**

- 1) The output per unit area in projects under CADA Beed (deficit) has been reduced substantially (from 37216 Rs/ha in 2003-04 to 9946 Rs/ha in 2004-05) due to lesser water availability in Bhutekarwadi project.
- 2) The ratio in case of CADA Nashik (deficit) has increased substantially compared to 2003-04 due to availability of sufficient water for irrigation in 2004-05 Kuttarwadi project.
- 3) The output is increased from Rs. 11000/ha to Rs. 15884/ha in respect of CADA Jalgaon (deficit) due to increased output in Hadgaon 1 & Waghala 1 projects.
- 4) Output in Shekdari project under AIC Akola (deficit) and Kardi, Vidrupa projects under BIPC Buldhana (deficit) has been increased, due to more cash crops grown in the command of these project.
- 5) The ratio in respect of projects under NIC Nanded (normal) has been reduced to 50 percent. This is attributable to non availability of water in Pota, Pimprala & Amthana projects.
- 6) Output in projects under CIPC Chandrapur (normal) has been increased from Rs.6200/ha to Rs. 24500/ha as compared to its past performance.



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	11827	No Water	7763	25667	---	15465	BA
	CADA Solapur	14383	No Water	23168	17042	---		VG
Deficit	CADA Beed	31395	37216	9946	76912	---	19849	BA
	CADA Nashik	7959	No Water	11836	10687	---		F
	NIC Nanded	21047	24055	14684	32521	10672		F
	CADA Jalgaon	10611	11125	15884	30169	22		M
	CADA Abad	26054	39074	21494	39074	20622		VG
	BIPC Buldhana	26327	29187	45252	44974	3205		VG
	AIC Akola	130075	190889	116686	301710	---		VG
Normal	YIC Yeotmal	18209	16905	No Water	20000	6792	20304	---
	AIC Akola	16086	No Water	No Water	17878	---		---
	NIC Nanded	23879	22125	13099	46660	14186		F
	PIC Pune	17132	13117	13135	31268	---		F
	CADA Pune	15511	15373	15738	18724	11312		M
	CADA Nagpur	21061	21006	22770	21160	20930		VG
	CIPC Chandrapur	7019	6291	24500	8239	6000		VG
	CADA Nashik	30561	31700	32586	32724	---		VG
Surplus	CADA Nagpur	21367	8531	19894	25928	---	19894	M
Abundant	SIC Sangli	30908	18571	17525	35304	---	34706	BA
	CIPC Chandrapur	12154	11584	21553	22246	758		F
	TIC Thane	22026	22849	24803	31022	10400		F
	NKIPC Thane	60052	57604	74944	117191	43285		VG
	KIC Ratnagiri	96751	102312	134720	102312	90200		VG

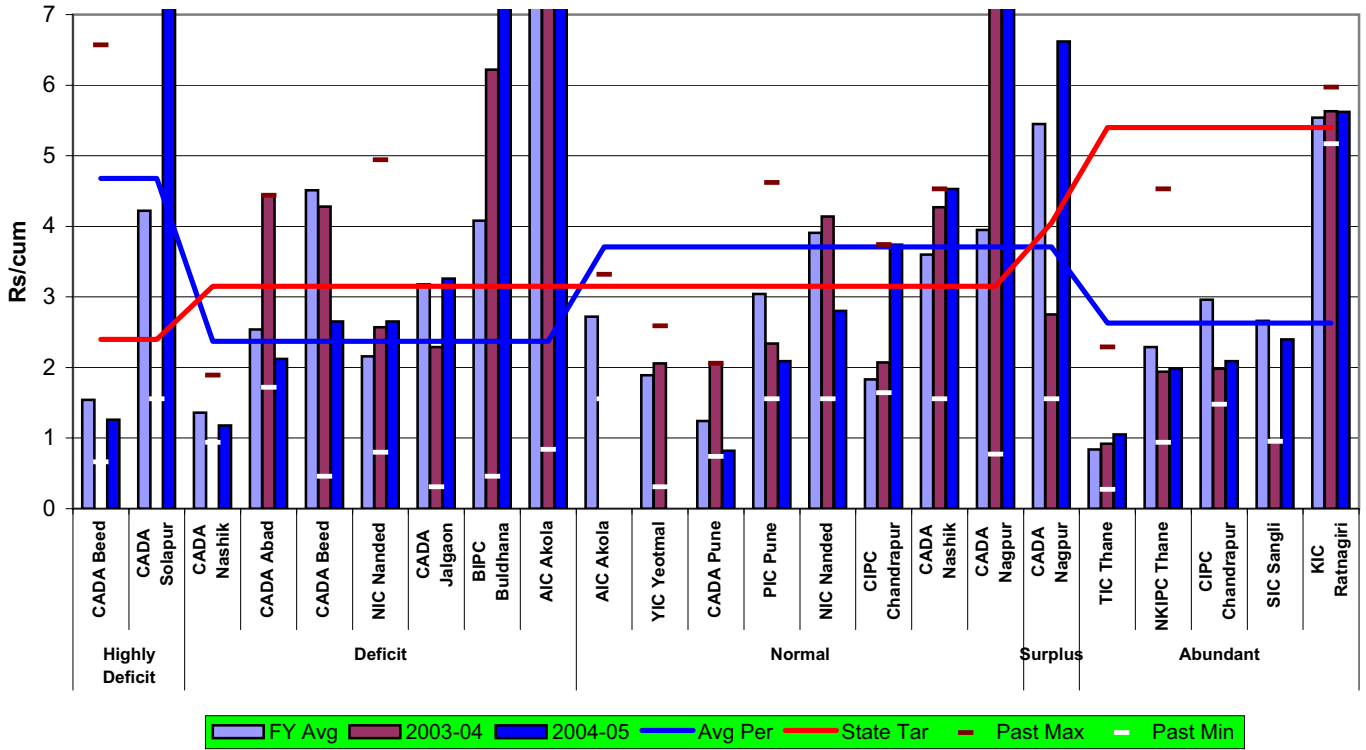
Note: 1) Figures in red indicate values exceeding range of graph.

2) Figures in red & blue excluded for Avg Per.

**Indicator IV : Output Per Unit Irrigation Water Supply**

- 1) The reduction in output of Tandulwadi project under CADA Aurangabad (deficit) has resulted in lowering the ratio for the circle as a whole to nearly 50 percent
- 2) The ratio in respect of CADA Jalgaon (deficit) has been increased due to increase in the output in Hatgaon-1 project from Rs.1.40/cum to Rs.3.53/cum & in Waghla-1 project from Rs. 1.42/cum to Rs.26.94/cum respectively.
- 3) Output on Shekadari project under AIC Akola (deficit) and Kardi & Vidrupa under BIPC Buldhana (deficit) has been increased from Rs. 31.15 to 47.2 /m<sup>3</sup> & Rs. 6.22 to 11.17 /m<sup>3</sup> respectively, on account of introduction of drip irrigation in Shekdari and more area under irrigation on lift.
- 4) In Thoseghar project under CADA Pune (normal), the output per unit irrigation water supply has come down from Rs. 2.06/cum to Rs. 0.82/cum. This is mainly due to reduction in WUE from 134 to 52 ha/Mcum.
- 5) In PIC Pune (normal) the ratio is slightly lowered due to reduction in water use efficiency in Rahu project. The project being a K. T. Weir, all the water is used for lift irrigation and, therefore, WUE expected is more than 200 ha/Mcum which was achieved in 2001-02, is declined since then.
- 6) Lesser output in Sawana, Hirdi & Nichpur projects under NIC Nanded (normal) has contributed in reducing the ratio for 2004-05 as compared to past.
- 7) Output per unit water supply is improved from 2.07 to 3.74 on all the three projects under CIPC Chandrapur (normal), as compared to their past performance.

**Indicator IV  
Minor Projects  
Output per unit Irrigation Water supply (Rs/cum)**



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	State Tar	Rank
Highly Deficit	CADA Beed	1.54	0.00	1.26	6.57	0.66	4.68	2.40	F
	CADA Solapur	4.22	0.00	8.09	8.09	1.56			VG
Deficit	CADA Nashik	1.36	0.00	1.18	1.89	0.94	2.37	3.15	BA
	CADA Abad	2.54	4.44	2.12	4.44	1.72			F
	CADA Beed	4.51	4.28	2.65	16.01	0.46			M
	NIC Nanded	2.16	2.57	2.65	4.94	0.80			M
	CADA Jalgaon	3.18	2.29	3.26	51.55	0.31			VG
	BIPC Buldhana	4.08	6.22	11.17	30.74	0.46			VG
	AIC Akola	16.41	31.15	47.20	75.12	0.84			VG
	AIC Akola	2.72	0.00	No Water	3.32	1.56			--
Normal	YIC Yeotmal	1.89	2.06	No Water	2.59	0.31	3.71	3.15	--
	CADA Pune	1.24	2.06	0.82	2.06	0.74			BA
	PIC Pune	3.04	2.34	2.09	4.62	1.56			F
	NIC Nanded	3.91	4.14	2.80	10.34	1.56			G
	CIPC Chandrapur	1.83	2.07	3.74	3.74	1.64			VG
	CADA Nashik	3.60	4.27	4.53	4.53	1.56			VG
	CADA Nagpur	3.95	7.80	8.28	8.28	0.77			VG
	Surplus	CADA Nagpur	5.45	2.75	6.62	12.02			1.56
Abundant	TIC Thane	0.84	0.92	1.05	2.29	0.27	2.63	5.40	BA
	NKIPC Thane	2.29	1.94	1.98	4.53	0.94			BA
	CIPC Chandrapur	2.96	1.98	2.09	7.04	1.48			BA
	SIC Sangli	2.66	0.95	2.40	19.77	0.95			BA
	KIC Ratnagiri	5.54	5.63	5.62	5.97	5.17			VG

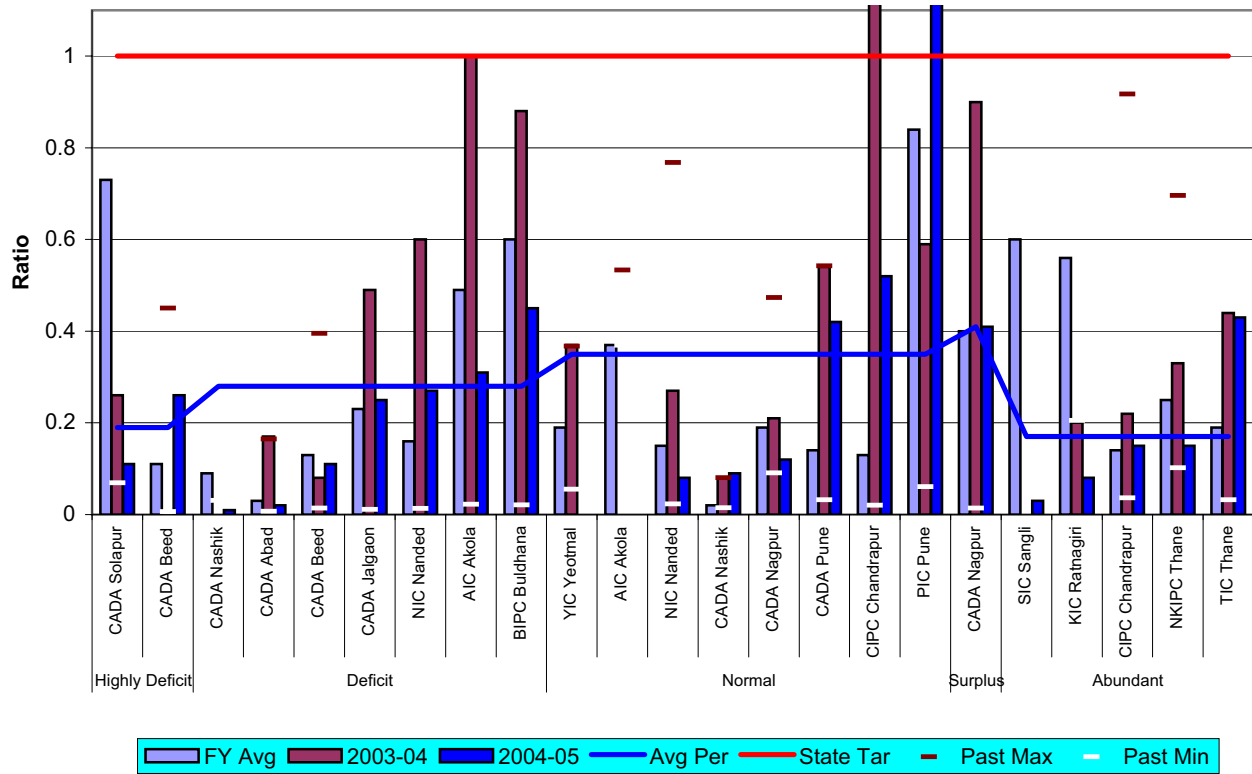
Note: 1) Figures in red indicate values exceeding range of graph. 2) Figures in red & blue excluded for Avg Per



**Indicator No. V: Cost Recovery Ratio**

- 1) In Tandulwadi project under CADA Aurangabad (deficit) increase in the O & M cost nearly 2 times and substantial reduction in recovery, has contributed in reducing in cost recovery ratio considerably.
- 2) The increase in recovery in Hiwarsinga & Dhanori projects under CADA Beed (deficit) has contributed to increase in the ratio for 2004-05 compared to last year.
- 3) The cost recovery ratio for projects under NIC Nanded (deficit) has reduced from 0.60 in 2003-04 to 0.27 in 2004-05. This is attributable to lesser recovery in five out of six projects (except Koshtewadi).
- 4) The performance of projects under PIC Pune (normal) is improved considerably. Increase in revenue by two and half times in Rahu project and O&M cost remaining more or less constant for the circle as a whole has resulted in increasing the ratio from 0.59 in 2003-04 to 2.29 in 2004-05.

**Indicator V  
Minor Projects  
Cost Recovery Ratio**

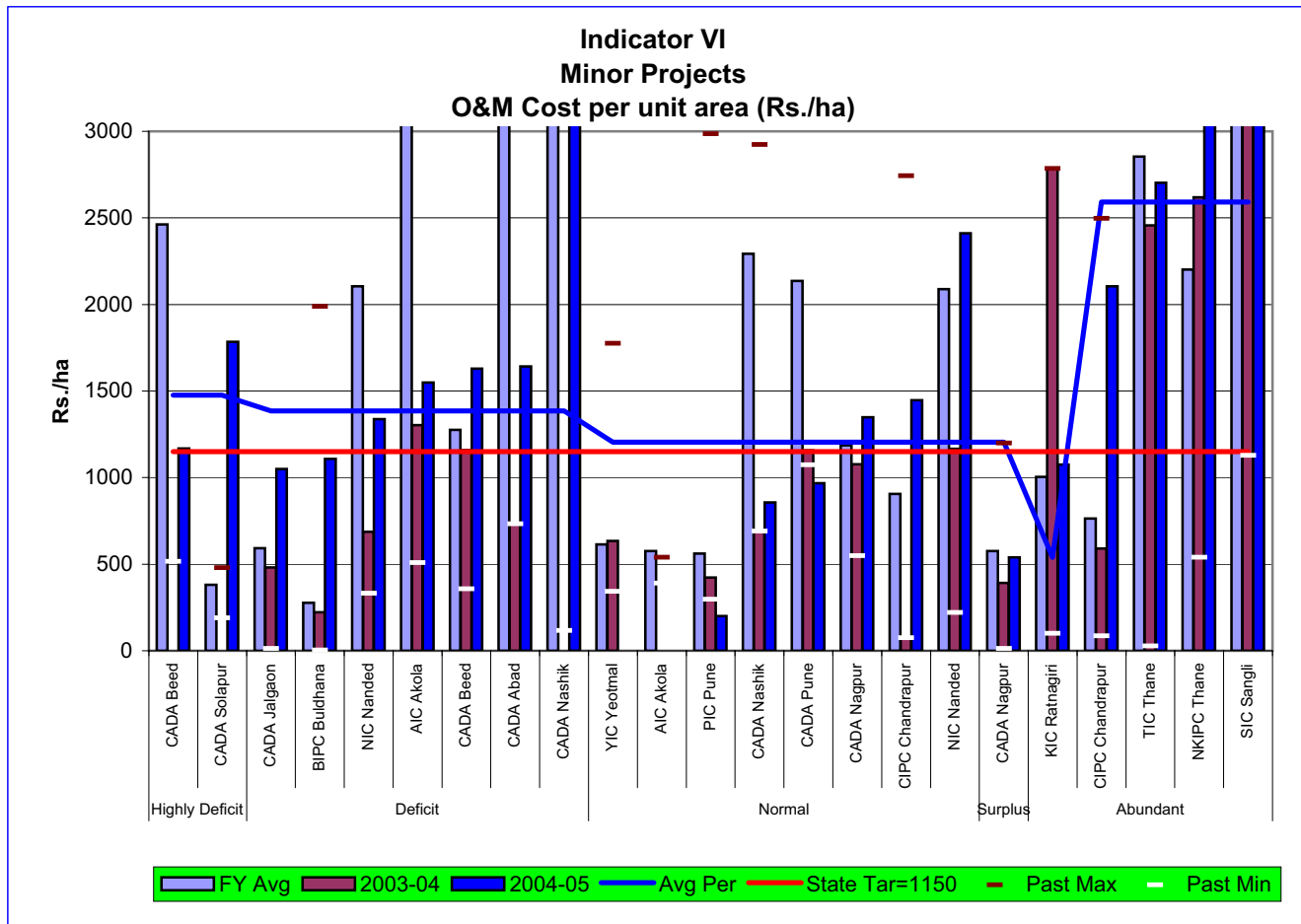


Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	0.73	0.26	0.11	3.09	0.07	0.19	BA
	CADA Beed	0.11	No recov	0.26	0.45	0.01		BA
Deficit	CADA Nashik	0.09	No recov	0.01	1.58	0.03	0.28	BA
	CADA Abad	0.03	0.17	0.02	0.17	0.01		BA
	CADA Beed	0.13	0.08	0.11	0.40	0.01		BA
	CADA Jalgaon	0.23	0.49	0.25	2.97	0.01		BA
	NIC Nanded	0.16	0.60	0.27	1.66	0.01		BA
	AIC Akola	0.49	1.00	0.31	2.66	0.02		BA
	BIPC Buldhana	0.60	0.88	0.45	24.50	0.02		BA
	YIC Yeotmal	0.19	0.37	No recov	0.37	0.06		---
Normal	AIC Akola	0.37	No recov	No recov	0.53	0.37	---	
	NIC Nanded	0.15	0.27	0.08	0.77	0.02	BA	
	CADA Nashik	0.02	0.08	0.09	0.08	0.02	BA	
	CADA Nagpur	0.19	0.21	0.12	0.47	0.09	BA	
	CADA Pune	0.14	0.54	0.42	0.54	0.03	BA	
	CIPC Chandrapur	0.13	1.93	0.52	1.93	0.02	F	
	PIC Pune	0.84	0.59	2.29	1.64	0.06	VG	
	CADA Nagpur	0.40	0.90	0.41	18.29	0.01	0.41	BA
Surplus	CADA Nagpur	0.40	0.90	0.41	18.29	0.01	0.41	BA
	SIC Sangli	0.60	No recov	0.03	1.60	1.24	0.24	BA
	KIC Ratnagiri	0.56	0.20	0.08	6.11	0.21	0.24	BA
	CIPC Chandrapur	0.14	0.22	0.15	0.92	0.04	0.24	BA
	NKIPC Thane	0.25	0.33	0.15	0.70	0.10	0.24	BA
Abundant	TIC Thane	0.19	0.44	0.43	23.33	0.03	0.24	BA

Note: 1) Figures in red indicate values exceeding range of graph.  
2) Figures in blue excluded for Avg Per 3) No recov indicates no recovery in the year

### **Indicator No VI : O&M Cost per unit Area**

- 1) The ratio for projects under CADA Jalgaon (deficit) has increased, due to reduction in irrigated area in Kunzar-2, Bambrud, Galan & Wakadi projects and O&M cost remaining nearly constant in 2004-05.
- 2) O&M cost per unit area on projects under AIC Akola (deficit) and BIPC Buldhana (deficit) is higher compared to last year's performance, as there was less irrigation on two out of four projects under each circle.
- 3) The increase in O&M cost nearly two times in Tandulwadi project under CADA Aurangabad (deficit) has attributed to increase the value for circle in 2004-05.
- 4) The ratio for projects under NIC Nanded (normal) is increased nearly 2 times due to non availability of water in three (Pota, Pimprala & Amthana) out of six projects. The reduction in O & M cost is nearly 50 percent in above three projects.
- 5) Payment towards unavoidable repair works carried out on some projects under CIPC Chandrapur (normal and abundant) has raised the O&M cost per unit area irrigated.
- 6) The O&M cost per unit area in KIC Ratanagiri (abundant) was Rs. 2785/ ha in 2003-04 mainly due to payment for deferred maintenance. During 2004-05, it came down to Rs. 1075/ha improving the performance to 'good' ranking.
- 7) The ratio has gone up from Rs. 2619/ha in 2003-04 to Rs. 4483 /ha in 2004-05 in projects under NKIPC Thane (abundant). The rise in O&M cost in Dhasai by 71 percent & at the same time decrease in the area irrigated by 24 percent and 36 percent in Dhasai & Panchnadi projects respectively are the main reasons for this change.
- 8) In projects under SIC Sangli (abundant) the O&M cost is reduced from Rs. 3.27 lakh to Rs. 2.31 lakh. At the same time, the area irrigated has increased from 21 to 30 ha reducing the ratio from Rs. 15571/ha Rs. 7831/ha. Still there is a scope for lowering this value.



Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	2463	No Irr	1169	3558	515	1476	BA
	CADA Solapur	381	No Irr	1784	479	190		BA
Deficit	CADA Jalgaon	592	482	1050	5829	13	1386	G
	BIPC Buldhana	277	222	1108	1989	3		VG
	NIC Nanded	2106	687	1338	7683	331		BA
	AIC Akola	3130	1304	1549	12105	509		BA
	CADA Beed	1275	1160	1629	4556	358		BA
	CADA Abad	3743	732	1643	7219	732		BA
	CADA Nashik	3138	No Irr	4754	11063	117		BA
Normal	YIC Yeotmal	615	634	No Irr	1775	342	1406	----
	AIC Akola	576	No Irr	No Irr	539	390		----
	PIC Pune	562	422	200	2986	297		BA
	CADA Nashik	2293	690	857	2924	690		M
	CADA Pune	2136	1157	967	4812	1073		M
	CADA Nagpur	1186	1077	1348	5018	548		BA
	CIPC Chandrapur	905	75	1448	2743	75		BA
	NIC Nanded	2088	1166	2411	5800	220		BA
Surplus	CADA Nagpur	576	391	540	1200	12	540	BA
Abundant	KIC Ratnagiri	1004	2785	1075	2785	100	2404	G
	CIPC Chandrapur	763	591	2105	2497	85		BA
	TIC Thane	2854	2457	2703	16164	27		BA
	NKIPC Thane	2202	2619	4483	15313	540		BA
	SIC Sangli	3671	15571	7831	15571	1128		BA

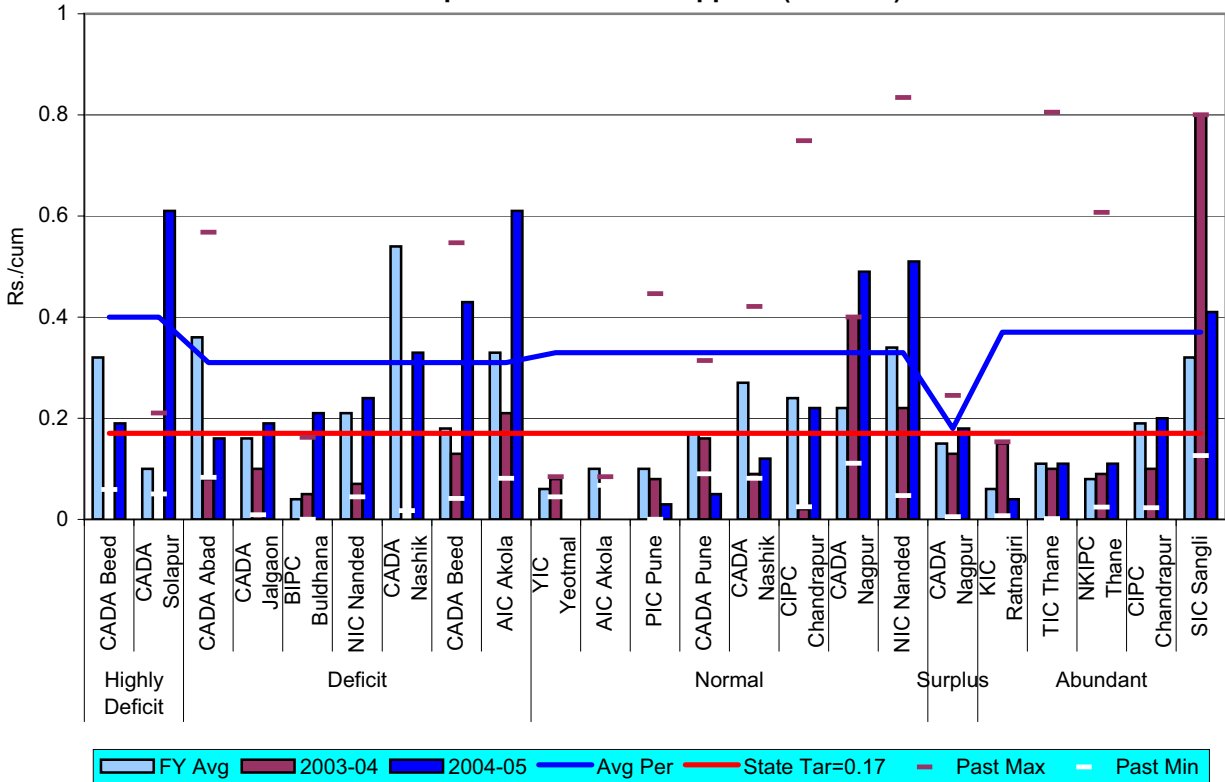
Note: 1) Figures in red indicate values exceeding range of graph.

2) Figures in red & blue excluded Avg Per

**Indicator No. VII : O&M Cost per unit Water Supplied**

- 1) There is an increase in O&M cost per unit water supplied for the projects under CADA Beed (deficit). This is attributable to no irrigation in 2003-04 in two projects (viz. Hivarsinga and Dhanori) out of three.
- 2) Due to lesser water availability, water allocated for irrigation was limited on all projects under AIC Akola, BIPC Buldhana & CIPC Chandrapur. Indispensable O&M cost with limited water supply has raised the ratio.
- 3) Non availability of water in Pota, Pimprala and Amthana projects under NIC Nanded (normal) has resulted in increasing the ratio during 2004-05.
- 4) Reduction in O&M cost from Rs. 3.27 lakh to Rs. 2.3 lakh in Benikre project under SIC Sangli (abundant) has lowered the ratio from 0.8 in 2003-04 to 0.41 in 2004-05.

**Indicator VII  
Minor Projects  
O&M cost per unit of Water Supplied (Rs./cum)**



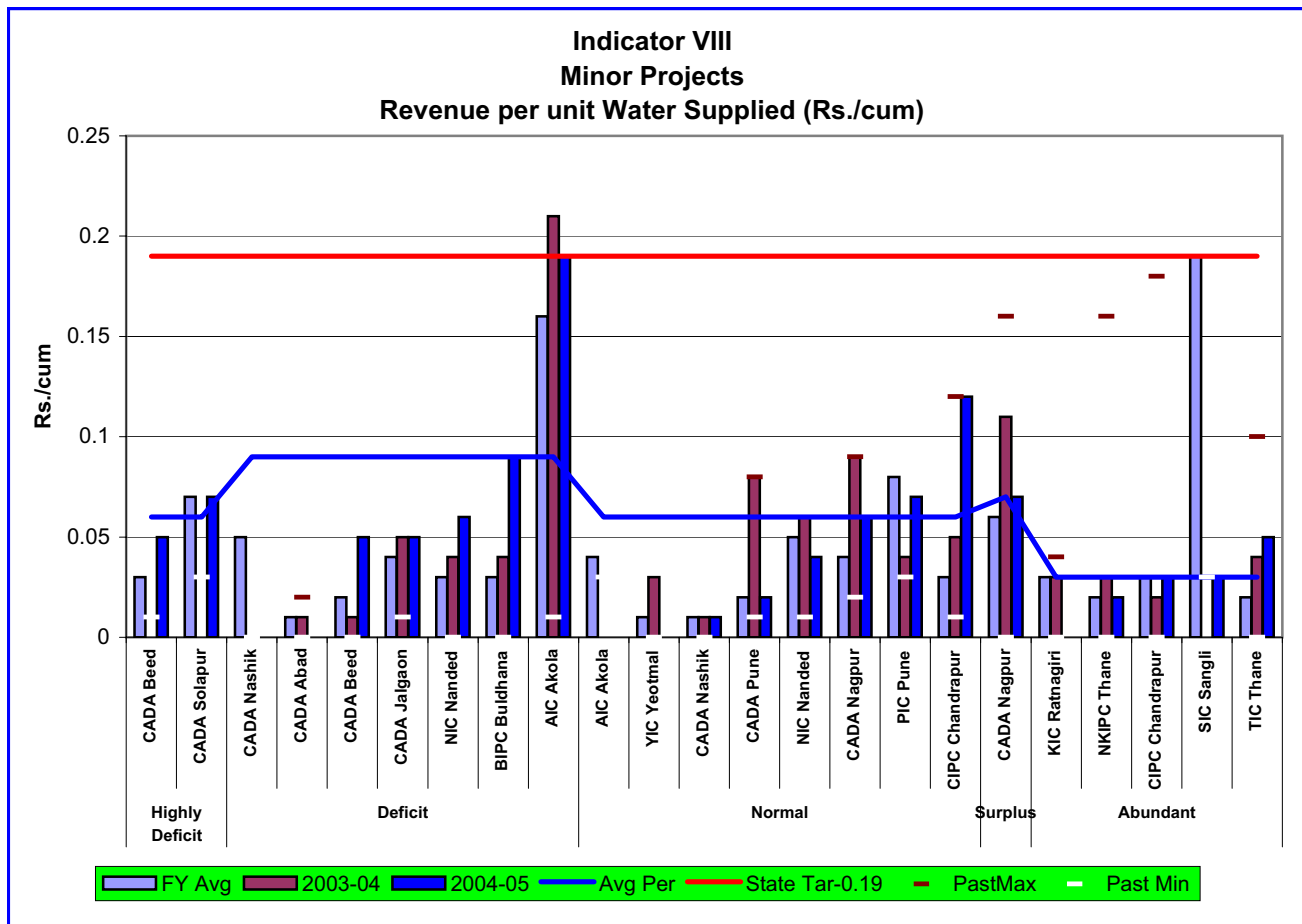
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	0.32	No Water	0.19	1.09	0.06	0.40	BA
	CADA Solapur	0.10	No Water	0.61	0.21	0.05		BA
Deficit	CADA Abad	0.36	0.08	0.16	0.57	0.08	0.31	G
	CADA Jalgaon	0.16	0.10	0.19	3.17	0.01		BA
	BIPC Buldhana	0.04	0.05	0.21	0.16	0.00		BA
	NIC Nanded	0.21	0.07	0.24	1.00	0.04		BA
	CADA Nashik	0.54	No Water	0.33	2.44	0.02		BA
	CADA Beed	0.18	0.13	0.43	0.55	0.04		BA
	AIC Akola	0.33	0.21	0.61	1.82	0.08		BA
	Normal	YIC Yeotmal	0.06	0.08	No Water	0.08		0.04
AIC Akola	0.10	No Water	No Water	0.08	0.07	---		
PIC Pune	0.10	0.08	0.03	0.45	0.00	BA		
CADA Pune	0.17	0.16	0.05	0.31	0.09	BA		
CADA Nashik	0.27	0.09	0.12	0.42	0.08	M		
CIPC Chandrapur	0.24	0.02	0.22	0.75	0.03	BA		
CADA Nagpur	0.22	0.40	0.49	0.40	0.11	BA		
NIC Nanded	0.34	0.22	0.51	0.83	0.05	BA		
Surplus	CADA Nagpur	0.15	0.13	0.18	0.25	0.01	0.18	BA
Abundant	KIC Ratnagiri	0.06	0.15	0.04	0.15	0.01	0.21	BA
	TIC Thane	0.11	0.10	0.11	0.81	0.00		F
	NKIPC Thane	0.08	0.09	0.11	0.61	0.02		F
	CIPC Chandrapur	0.19	0.10	0.20	1.89	0.02		BA
	SIC Sangli	0.32	0.80	0.41	0.80	0.13		BA

Note: 1) Figures in red indicate values exceeding range of graph.

2) Figures in red & blue excluded for Avg.Per

### **Indicator No. VIII Revenue per unit Water Supplied**

- 1) Due to less water availability, revenue recovery on all the projects under BIPC Buldhana and CIPC Chandrapur is quite low.
- 2) There is an increase in the ratio for the projects under CADA Beed (deficit). This is attributable to no irrigation in 2003-04 in two (Hivarsinga and Dhanori) out of three projects.
- 3) Non-availability of water in Pota, Pimprala and Amthana projects under NIC Nanded (normal) has resulted in reducing the ratio during 2004-05.
- 4) There was a substantial increase in revenue over last year in Rahu project (from Rs. 6.39 lakh to Rs. 21.6 lakh) under PIC Pune (normal). The area irrigated has also increased in all the three projects. This resulted in increasing the ratio from Rs. 0.04 to Rs. 0.07.
- 5) Reduction in recovery from Rs. 0.55 lakh to Rs. 0.11 lakh in Dhasai project under NKIPC Thane (abundant) has brought down the ratio from Rs. 0.03 in 2003-04 to Rs. 0.02 in 2004-05. There was a marginal decrease in water use in both the projects under this circle.



Plangroup	Circle	FY Avg	2003-04	2004-05	PastMax	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	0.03	No recov	0.05	0.56	0.01	0.06	BA
	CADA Solapur	0.07	No recov	0.07	0.56	0.03		BA
Deficit	CADA Nashik	0.05	No recov	No recov	0.56	0.01	0.09	--
	CADA Abad	0.01	0.01	No recov	0.02	0.01		--
	CADA Beed	0.02	0.01	0.05	0.56	0.01		BA
	CADA Jalgaon	0.04	0.05	0.05	1.38	0.01		BA
	NIC Nanded	0.03	0.04	0.06	0.56	0.01		BA
	BIPC Buldhana	0.03	0.04	0.09	2.10	0.01		BA
	AIC Akola	0.16	0.21	0.19	0.56	0.01		VG
	Normal	AIC Akola	0.04	No recov	No recov	0.56		0.03
YIC Yeotmal		0.01	0.03	No recov	0.56	0.01	--	
CADA Nashik		0.01	0.01	0.01	0.56	0.01	BA	
CADA Pune		0.02	0.08	0.02	0.08	0.01	BA	
NIC Nanded		0.05	0.06	0.04	0.56	0.01	BA	
CADA Nagpur		0.04	0.09	0.06	0.09	0.02	BA	
PIC Pune		0.08	0.04	0.07	0.56	0.03	BA	
CIPC Chandrapur		0.03	0.05	0.12	0.12	0.01	F	
Surplus	CADA Nagpur	0.06	0.11	0.07	0.16	0.01	0.07	BA
Abundant	KIC Ratnagiri	0.03	0.03	No recov	0.04	0.01	0.03	--
	NKIPC Thane	0.02	0.03	0.02	0.16	0.01		BA
	CIPC Chandrapur	0.03	0.02	0.03	0.18	0.01		BA
	SIC Sangli	0.19	No recov	0.03	1.26	0.03		BA
	TIC Thane	0.02	0.04	0.05	0.10	0.01		BA

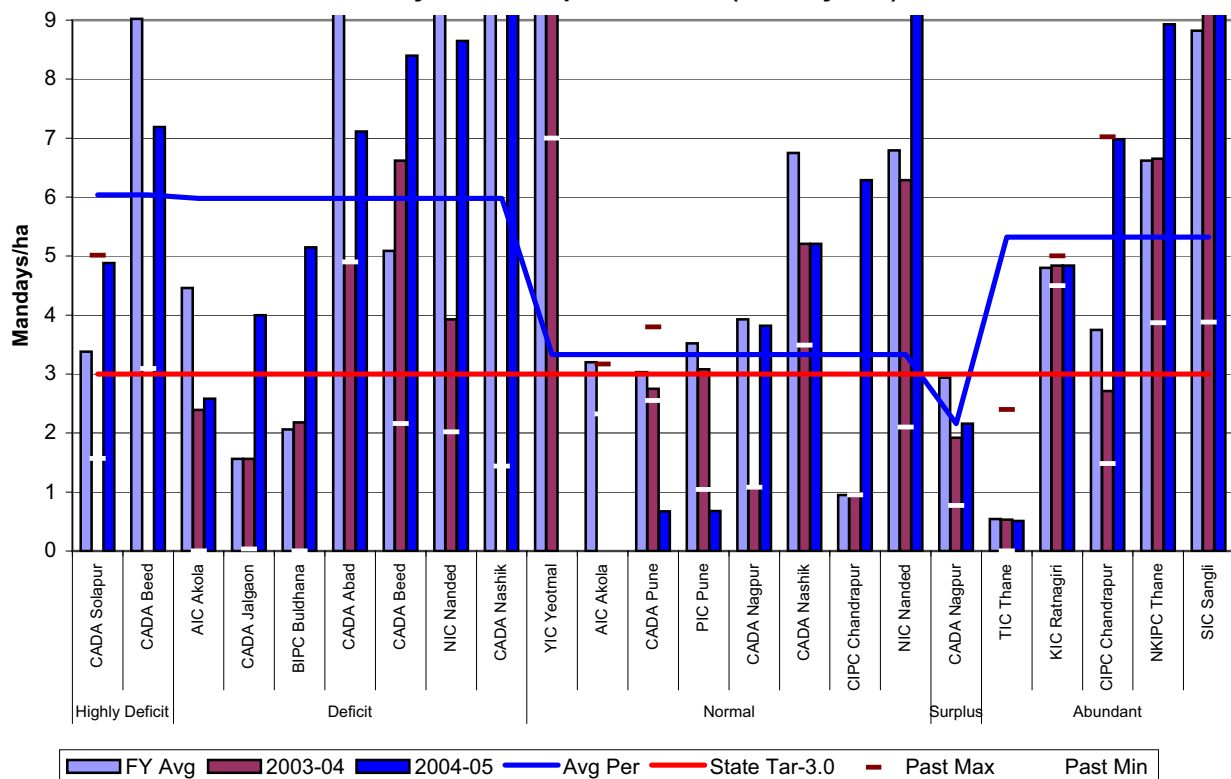
Note: Figures in blue excluded for Avg Per.



**Indicator No. IX : Mandays for O&M per unit Area Irrigated**

- 1) Substantial increase in mandays in Bambrud, Galan, Wakadi, Chavadi projects has resulted in increasing the mandays per ha under CADA Jalgaon (deficit) during 2004-05. The increase is due to transfer of two persons from other projects to Chavadi project and diversion of manpower from other projects to Galan project.
- 2) Due to less water availability, area irrigated is quite low. Hence mandays per unit area irrigated are higher than the State target on projects under BIPC Buldhana (deficit) & CIPC Chandrapur (normal).
- 3) The ratio for CADA Aurangabad (deficit) has increased due to increase in mandays in Tandulwadi project during 2004-05.
- 4) Non availability of water in three out of six projects viz. Pota, Pimparala and Amthana, causing substantial reduction in irrigated area of the circle have contributed to increase in the ratio under NIC Nanded (normal) in 2004-05. However, there was 50 percent reduction in mandays in Nichpur project.
- 5) Increase in management staff from one to two by transfer in Benikre project under SIC Sangli (abundant) has raised the ratio from 17.38 in 2003-04 to 24.75 in 2004-05 in spite of increase in area irrigated from 21 to 30 ha.

**Indicator IX  
Minor Projects  
Mandays for O&M per unit area (Mandays/ha)**



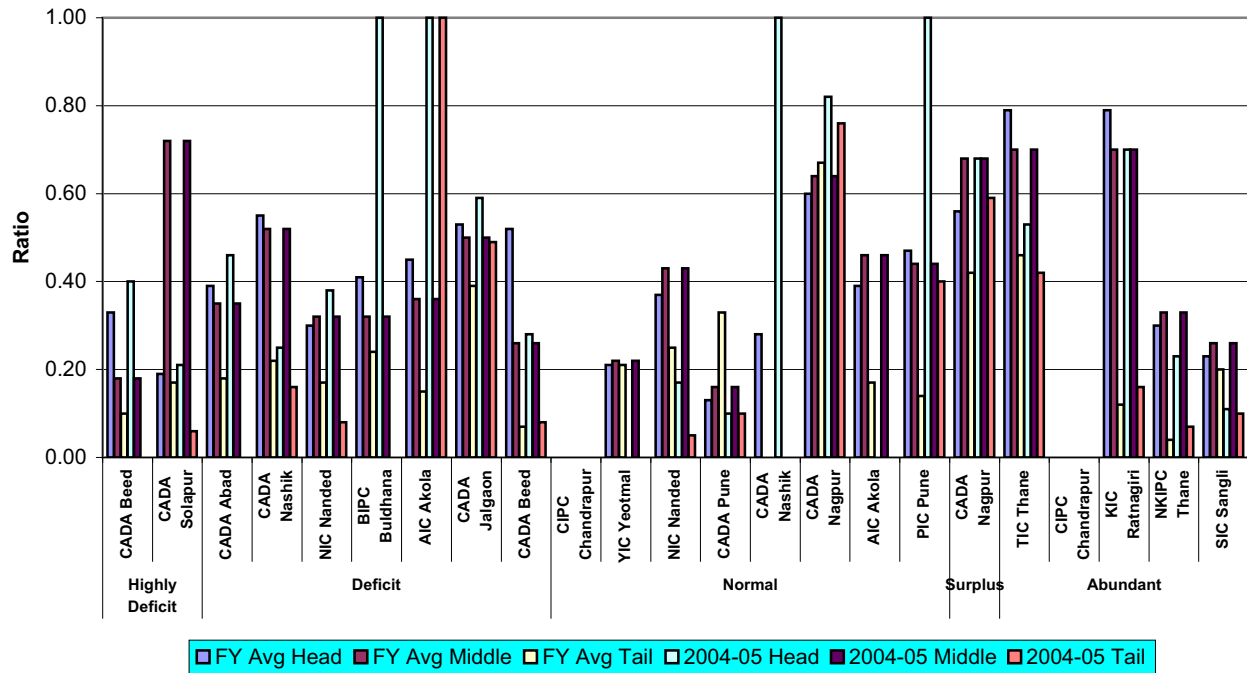
Plangroup	Circle	FY Avg	2003-04	2004-05	Past Max	Past Min	Avg Per	Rank
Highly Deficit	CADA Solapur	3.38	No Irr	4.88	5.01	1.57	6.04	BA
	CADA Beed	9.02	No Irr	7.19	9.12	3.09		BA
Deficit	AIC Akola	4.46	2.39	2.58	9.31	0.00	5.98	VG
	CADA Jalgaon	1.56	1.56	4.00	17.23	0.03		F
	BIPC Buldhana	2.06	2.18	5.15	31.74	0.00		BA
	CADA Abad	11.24	4.90	7.11	26.54	4.90		BA
	CADA Beed	5.09	6.62	8.40	20.28	2.16		BA
	NIC Nanded	9.15	3.93	8.65	27.73	2.02		BA
	CADA Nashik	57.33	No Irr	21.80	150.43	1.44		BA
	Normal	YIC Yeotmal	12.32	12.00	No Irr	36.00		7.00
AIC Akola		3.20	No Irr	No Irr	3.17	2.32	---	
CADA Pune		3.03	2.75	0.67	3.80	2.55	VG	
PIC Pune		3.52	3.08	0.68	65.49	1.04	VG	
CADA Nagpur		3.93	1.08	3.82	32.02	1.08	M	
CADA Nashik		6.75	5.21	5.21	9.36	3.49	BA	
CIPC Chandrapur		0.95	0.95	6.29	0.95	0.95	BA	
NIC Nanded		6.79	6.29	10.05	18.57	2.10	BA	
Surplus	CADA Nagpur	2.94	1.92	2.16	12.37	0.77	2.16	VG
Abundant	TIC Thane	0.54	0.53	0.51	2.40	0.00	5.32	VG
	KIC Ratnagiri	4.80	4.84	4.84	5.00	4.50		BA
	CIPC Chandrapur	3.75	2.71	6.98	7.02	1.48		BA
	NKIPC Thane	6.62	6.65	8.93	32.27	3.87		BA
	SIC Sangli	8.82	17.38	24.75	17.38	3.88		BA

Note: Figures in red indicate values exceeding range of graph.

**Indicator No. XI : Equity performance**

- 1) The projects under CADA Nagpur (surplus) distributed water to head, middle & tail reach farmers quite equitably.

**Indicator XI  
Minor Project  
Equity performance**

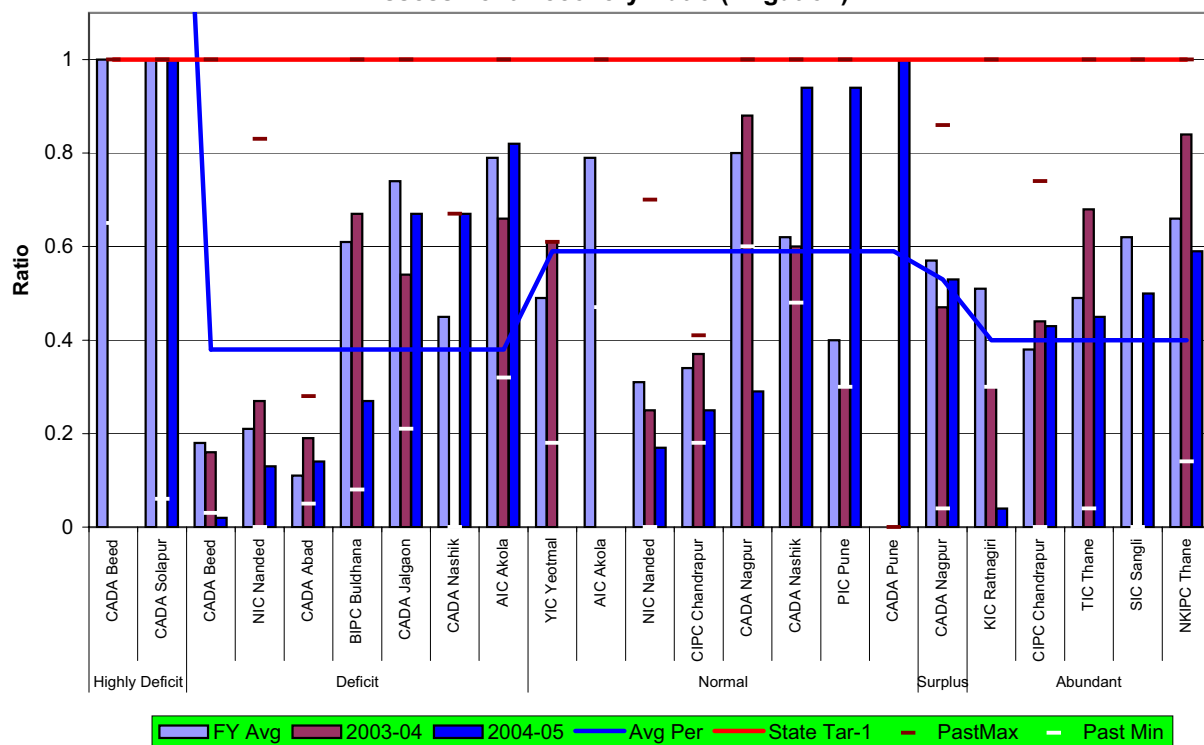


Plangroup	Circle	Five years Average			2004-05		
		Head	Middle	Tail	Head	Middle	Tail
Highly Deficit	CADA Beed	0.33	0.18	0.10	0.40	0.18	0.00
	CADA Solapur	0.19	0.72	0.17	0.21	0.72	0.06
Deficit	CADA Abad	0.39	0.35	0.18	0.46	0.35	0.00
	CADA Nashik	0.55	0.52	0.22	0.25	0.52	0.16
	NIC Nanded	0.30	0.32	0.17	0.38	0.32	0.08
	BIPC Buldhana	0.41	0.32	0.24	1.00	0.32	0.00
	AIC Akola	0.45	0.36	0.15	1.00	0.36	1.00
	CADA Jalgaon	0.53	0.50	0.39	0.59	0.50	0.49
	CADA Beed	0.52	0.26	0.07	0.28	0.26	0.08
	CADA Beed	0.52	0.26	0.07	0.28	0.26	0.08
Normal	CIPC Chandrapur	0.00	0.00	0.00	0.00	0.00	0.00
	YIC Yeotmal	0.21	0.22	0.21	0.00	0.22	0.00
	NIC Nanded	0.37	0.43	0.25	0.17	0.43	0.05
	CADA Pune	0.13	0.16	0.33	0.10	0.16	0.10
	CADA Nashik	0.28	0.00	0.00	1.00	0.00	0.00
	CADA Nagpur	0.60	0.64	0.67	0.82	0.64	0.76
	AIC Akola	0.39	0.46	0.17	0.00	0.46	0.00
	PIC Pune	0.47	0.44	0.14	1.00	0.44	0.40
Surplus	CADA Nagpur	0.56	0.68	0.42	0.68	0.68	0.59
Abundant	TIC Thane	0.79	0.70	0.46	0.53	0.70	0.42
	CIPC Chandrapur	0.00	0.00	0.00	0.00	0.00	0.00
	KIC Ratnagiri	0.79	0.70	0.12	0.70	0.70	0.16
	NKIPC Thane	0.30	0.33	0.04	0.23	0.33	0.07
	SIC Sangli	0.23	0.26	0.20	0.11	0.26	0.10

**Indicator No. XII (I) : Assessment Recovery Ratio (Irrigation)**

- 1) Recovery of water charges for irrigation use fully in Mangi project under CADA Solapur (highly deficit) resulted in achievement of the target of 1.00. In Pathri, the other project under CADA Solapur (highly deficit) there was no irrigation for last four years due to non availability of water.
- 2) Substantial reduction in irrigation recovery in Bhutekarwadi under CADA Beed (deficit) in 2004-05 and no recovery in Dhanori project, has resulted in reducing the ratio from Rs. 0.16 to Rs. 0.02. Efforts are required by field officers to enhance the recovery.
- 3) Increase in the irrigation recovery in Galan, Wakadi and Dudhkheda projects under CADA Jalgaon (deficit) has resulted in increasing the ratio from 0.54 (2003-04) to 0.67 (2004-05).
- 4) Due to nonavailability of water, there was no recovery in Kuttarwadi project under CADA Nashik (deficit) in 2003-04. In 2004-05 water was available for irrigation. Therefore, the ratio of recovery to the assessment for the project has reached the value of 0.67 in 2004-05.
- 5) Increase in irrigation recovery by nearly 2.5 times in Mahiravani project under CADA Nashik (normal), has contributed in increasing the ratio from 0.60 to 0.94 in 2004-05.
- 6) In Thoseghar project under CADA Pune (normal), there was no recovery in 2003-04. However, the project have recovered water charges for irrigation use fully achieving the State target of 1.00.

**Indicator XII - I  
Minor Projects  
Assessment Recovery Ratio (Irrigation)**



Plangroup	Circle	FY Avg	2003-04	2004-05	PastMax	Past Min	Avg Per	Rank
Highly Deficit	CADA Beed	1.00	No Recov	No Recov	1.00	0.65	1.00	---
	CADA Solapur	1.00	No Recov	1.00	1.00	0.06		VG
Deficit	CADA Beed	0.18	0.16	0.02	1.00	0.03	0.45	BA
	NIC Nanded	0.21	0.27	0.13	0.83	0.00		BA
	CADA Abad	0.11	0.19	0.14	0.28	0.05		BA
	BIPC Buldhana	0.61	0.67	0.27	1.00	0.08		BA
	CADA Jalgaon	0.74	0.54	0.67	1.00	0.21		F
	CADA Nashik	0.45	No Recov	0.67	0.67	0.00		F
	AIC Akola	0.79	0.66	0.82	1.00	0.32		M
Normal	YIC Yeotmal	0.49	0.61	No Recov	0.61	0.18	0.60	---
	AIC Akola	0.79	No Recov	No Recov	1.00	0.47		---
	NIC Nanded	0.31	0.25	0.17	0.70	0.00		BA
	CIPC Chandrapur	0.34	0.37	0.25	0.41	0.18		BA
	CADA Nagpur	0.80	0.88	0.29	1.00	0.60		BA
	CADA Nashik	0.62	0.60	0.94	1.00	0.48		G
	PIC Pune	0.40	0.30	0.94	1.00	0.30		G
	CADA Pune	No Recov	No Recov	1.00	0.00	---		VG
Surplus	CADA Nagpur	0.57	0.47	0.53	0.86	0.04	0.53	F
Abundant	KIC Ratnagiri	0.51	0.30	0.04	1.00	0.30	0.40	BA
	CIPC Chandrapur	0.38	0.44	0.43	0.74	0.00		BA
	TIC Thane	0.49	0.68	0.45	1.00	0.04		BA
	SIC Sangli	0.62	No Recov	0.50	1.00	0.00		F
	NKIPC Thane	0.66	0.84	0.59	1.00	0.14		F

Note: Figures in red indicate values exceeding range of graph.

#### **4.2.0 Conclusions:**

1) Based on annual benchmarking analysis, the action plans for improvement of performance could be decided and executed for improvement of overall performance.

2) Overall improvement is observed in performance of projects, particularly in water use and recovery of water charges.

## Chapter - 5

### Actions Taken for Improvement of Performance

The process of benchmarking of irrigation projects in the State was initiated with six major projects in 2000-01 & by now almost all projects are covered under it. In the initial years there was more thrust on trainings & workshops to percolate the subject up to grass root level of field staff. The 262 projects included in the report of 2003-04 are only considered for State report for comparison of their performance with preceding year.

The State wide reports also undergone various stages viz. project wise presentation in 2001-02, circle wise analysis in 2002-03 & plangroup wise analysis in 2003-04. During 2004-05, State targets are decided plangroup wise wherever possible.

In order to improve the performance of irrigation projects GOM has initiated following steps/ administrative and policy reforms in the irrigation sector.

#### 5.1.0 Participatory Irrigation Management

Policy decision to handover the management of the entire command area of irrigation potential created to the Water Users' Associations was taken in July 2001. According to this policy, water will be supplied to WUAs only on volumetric basis. No individual will be supplied water in future. To create an awareness for formation of WUAs; amongst the beneficiaries in the command of the project, special campaign has been under taken during 2<sup>nd</sup> October to 16<sup>th</sup> October every year since 2002. An appreciable increase in area covered under WUA has taken place in last five years. This is evident from following table:

Year	No. of operative WUAs	Area covered under operative WUAs (lakh ha)
2000-01	258	0.93
2001-02	283	1.01
2002-03	357	1.17
2003-04	564	1.65
2004-05	774	2.51



Recently Waghad, a major project under CADA Nashik is totally handed over to Federation of Water Users' Associations under Maharashtra Management of Irrigation Systems by Farmers Act, 2005 as Water Users' Associations are formed in most of the command area of the project. Water will be supplied to the Federation at canal head on volumetric basis. The Federation will distribute the water further to WUAs as per their sanctioned quota. However the headworks and canal head regulator will be managed in public interest by Government organisation and also from security point of view.

### **5.2.0 Participation of Users in Planning**

The participation of water users in formulation of Preliminary Irrigation Programme of projects has been made mandatory. Accordingly instructions are issued vide letter dated 26.10.2004. The Preliminary Irrigation Programmes (PIP) of major, medium & minor projects are prepared and finalised after discussions with representatives or office bearers of WUAs, Chairman/representatives of local sugar factories, representatives of non irrigation users, NGOs/societies working in irrigation sector, officers from Agriculture Department, Mechanical Organisation etc. This will enable the farmers to get maximum benefits from the project, which in turn will assist in establishing social equity.

### **5.3.0 Participation Of Beneficiaries In Canal Maintenance**

For improving the performance of the existing irrigation schemes it has been decided from the year 2002-03 to carry out annual maintenance of canals/distributaries etc. through active involvement of local beneficiaries & villagers (*Shramdan*), CRT & work charged establishment. Employment Guarantee Schemes, SGRY, School/College students and machinery of local sugar factories in the command area. This approach of the State is in tune with the Govt. of India's policy & is successfully implemented. A circular to the effect was issued on 16.10.2003. A campaign named as "*Vishweshwaria kalwa Swachchata Abhiyan*" for canal cleaning is undertaken every year. Overwhelming response has been received from all above organisations.

Funds on large scale are required for annual maintenance of canal systems. To achieve savings in expenditure and to create awareness amongst the beneficiaries in command it was decided to get the maintenance works done by using the machinery of mechanical organisation. The works started on 2<sup>nd</sup> October 2002. Works to the tune of Rs. 0.71 lakhs and Rs 32 lakhs have been executed through *Shramdan* during the year 2003-04 and 2004-05 respectively, whereas during 2004-05 1 works of Rs.12.14 crores have been carried out in the State.

### **5.4.0 Water Auditing**

One of the reasons for under utilisation of created irrigation potential is unaccounted use of water. To have proper account of water and its use in various sectors & to increase the revenue of Government, water auditing for all irrigation projects in the State has been made mandatory as per the provisions made in State Water Policy. The process of water auditing is checking sector wise water use against planning, water use efficiency in irrigation and losses like evaporation and conveyance losses.

The first report of water auditing for the year 2003-04 was published in March 2005 which contains abstract of water accounts of 50 major 131 medium and 1048 minor projects in the State. During 2004-05 inspection of 34 Divisions has been carried out by the officers from three units in MWIC office, Aurangabad. Records relevant with irrigation management were critically examined during the inspections. The water audit report 2004-05 is under preparation.

Training courses are conducted regularly by WALMI, Aurangabad for senior & middle level officers & staff working in irrigation management. During 2003-04 State level workshop on this subject was held at WALMI, Aurangabad on 29<sup>th</sup> & 30<sup>th</sup> June 2004. Whereas Two State level workshops were held at WALMI on 29<sup>th</sup> & 30<sup>th</sup> June 2005 and 14<sup>th</sup> & 15<sup>th</sup> October 2005 for middle level officers for inducing the importance of water audit methods and importance, transparency and responsibility of service providers in respect of increased accountability & improved level of service to customers.

Cadre wise break-up of trainees is as follows.

Year	Period of Training	Cadre	No of trainees
2004-05	29-06-04 to 30-6-04	Executive Engineer	17
		Deputy Executive Engineer/ Sub divisional Engineer/ Sub divisional Officer/ Deputy Superintending Engineer	46
		Assistant Engineer II/ Sectional Engineer	7
2005-06	29-06-05 to 30-6-05	Deputy Executive Engineer/ Sub divisional Engineer/ Sub divisional Officer/ Deputy Superintending Engineer	25
		Assistant Engineer II/ Sectional Engineer	47
2005-06	14-10-05 to 15-10-05	Deputy Executive Engineer/ Sub divisional Engineer/ Sub divisional Officer	30
		Assistant Engineer II/ Sectional Engineer	48

#### 5.5.0 Recovery of water charges :

For efficient performance it is necessary that the irrigation system should be self sustainable. The water rates for irrigation & non irrigation uses have been revised with effect from September 2001 in such a way that 100% O & M cost is recovered from recovery of water charges. In addition there was an in built provision of 15% increase in water rates every year up to 2002-03. Water rates for irrigation & non irrigation effective for the year 2002-03 are continued for 2003-04 & 2004-05 due to drought conditions in the State.

Circle wise targets for recovery are fixed right at the start of financial year and review of recovery is taken in every bimonthly meeting of Superintending Engineers with Secretary (CAD). Similarly, a special drive is taken for recovery of arrears of non-irrigation use every year.

Efforts are taken to minimise the operation and maintenance cost.

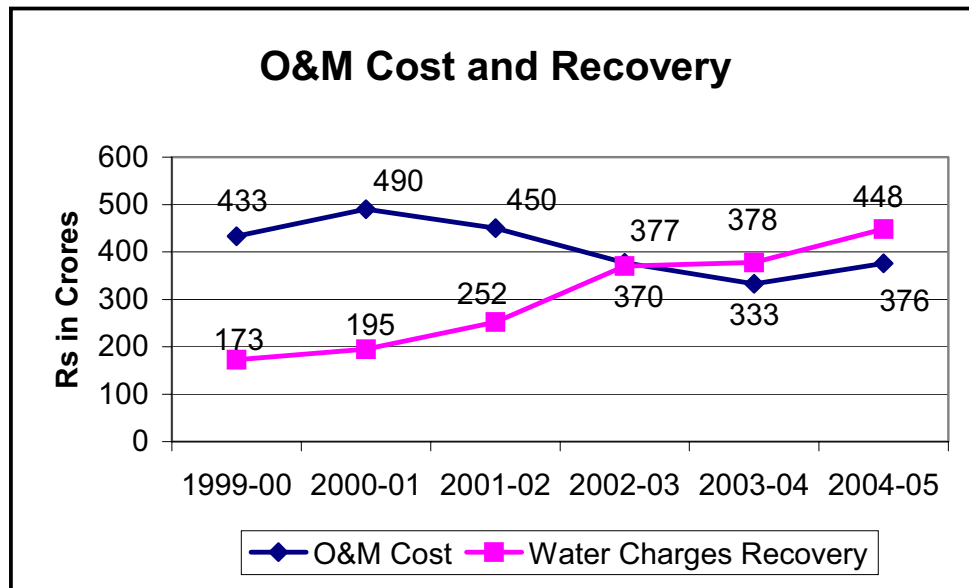
As a result of above mentioned measures it is seen that since last three years the expenditure on O & M is 100% met through recovery of water charges; Details are as follows:

(Rs. in crores)

Year	O & M cost	Water charges recovery
2002-03	370	377
2003-04	333	378
2004-05	376	448

The water rates for three different seasons are included as Appendix VIII

The expenditure on irrigation management including establishment charges for the year 2003-04 and 2004-05 was Rs. 3330 million and Rs. 3780 million respectively. Whereas the total recovery of the water charges pertaining to irrigation and non-irrigation water use was Rs. 3760 million and Rs. 4480 million respectively. Thus, it can very well be concluded that the expenditure on irrigation management is 100% met through recovery of water charges. It will be very clear from the graph below :



### 5.6.0 Maharashtra Water Sector Improvement Project (MWSIP)

Though the irrigation potential of about 3.913 Mha is created by June 2004, the actual utilisation is about 50% only. To increase the utilisation, top priority is given to improve the performance of the existing irrigation system. This will be effected by initiating a combination of policy, institutional and physical improvements by modernisation of irrigation sector.

An agreement has been executed between World Bank, GoI & GoM for funding the **Maharashtra Water Sector Improvement Project (MWSIP)** on 19/08/2005. The project envisages to rehabilitate and modernise about 286 Irrigation projects (Including 9 Major, 13 Medium & 264 Minor schemes) covering about 6,68,850 ha. Culturable Command. It also included beneficiaries contribution at Rs. 500/ha. In the form of cash or kind, for only those civil works which will be carried in WUA's area. The Government of Maharashtra's and beneficiaries' share will be respectively about 60.70 million US\$ and 7.62 million US\$ and **World Bank's loan will be 325 million US\$.**

The primary objectives of the Project are- i) to strengthen the State's capacity for multisectoral planning, development & sustainable management of the water resources and ii) to improve irrigation service delivery on a sustainable basis to increase productivity of irrigated agriculture & contribute to rural poverty reduction.

The project consists of following four main components.

**A) Institutional Restructuring and Capacity Building**

This includes Establishment and Operationalisation of Maharashtra Water Resources Regulatory Authority, Restructuring existing MKVDC in to MKVWRC as a river basin agency & it's Capacity Building, Restructuring & Capacity Building of WRD, Strengthening & Capacity Building of Water and Land Management Institute (WALMI), and Integrated Computerized Information System.

**B) Improving Irrigation Service Delivery and Management:** This includes Participatory Rehabilitation & Modernization, Dam Safety works, Formation and Capacity Building of Water Users' Associations, Improved Water Management Practices, Strengthening Agricultural Support Services in selected projects and Environmental & Social Management Plan.

**C) Innovative Pilots-** This includes Piloting User centered Aquifer level Ground Water Management and Piloting Innovative Irrigation Service Management.

**D) Project Management-** This includes- Project preparation and Management Unit, Monitoring & Evaluation and Information Education & Communication.

The Project is in it's starting phase i.e. completion of prerequisites like estimates, bids, T.O.R.S. for various consultancies etc. The project period is 6 years w. e. f. 29<sup>th</sup> Sept. 2005 up to 30<sup>th</sup> Sept. 2011.

### **5.7.0 Maharashtra Management Of Irrigation Systems By Farmers Act 2005**

Looking at the slow pace of participatory irrigation management in last decade a policy decision has been taken to provide legal recognition to the contribution and operation of WUAs. Accordingly, the Maharashtra Management of Irrigation Systems by Farmers Act-2005 has been passed in State legislature.

As per the provisions in this act, all the beneficiaries in the command of a distributary /minor will be the members of WUA once the area is notified under this act.

### **5.8.0 Land Reclamation**

The problem of lands becoming saline or waterlogged is increasing with the advancement of irrigation facilities. The affected area in Maharashtra during the year 2002-03 was 26298 ha.(1.85% of ICA)\* Whereas during the year 2003-04 the affected area was 25573 ha (1.58% of ICA). To overcome this problem & suggest remedial measures, the Directorate of Irrigation Research & Development, Pune has been assigned the job of survey of drainage schemes, formulation of plans etc. in an integrated manner. Through different programmes of the Directorate, working all over the State, it has been possible to limit lands affected with waterlogging & salinity.

### **5.9.0 Fixing norms of Water Use Efficiency**

Prior to 2001 it was observed that actual irrigation use figures were far below even after water was made available for Rabi & Hot weather seasons. This state of affairs was not so encouraging & criteria of WUE, a very important parameter in performance evaluation of irrigation was suggested.

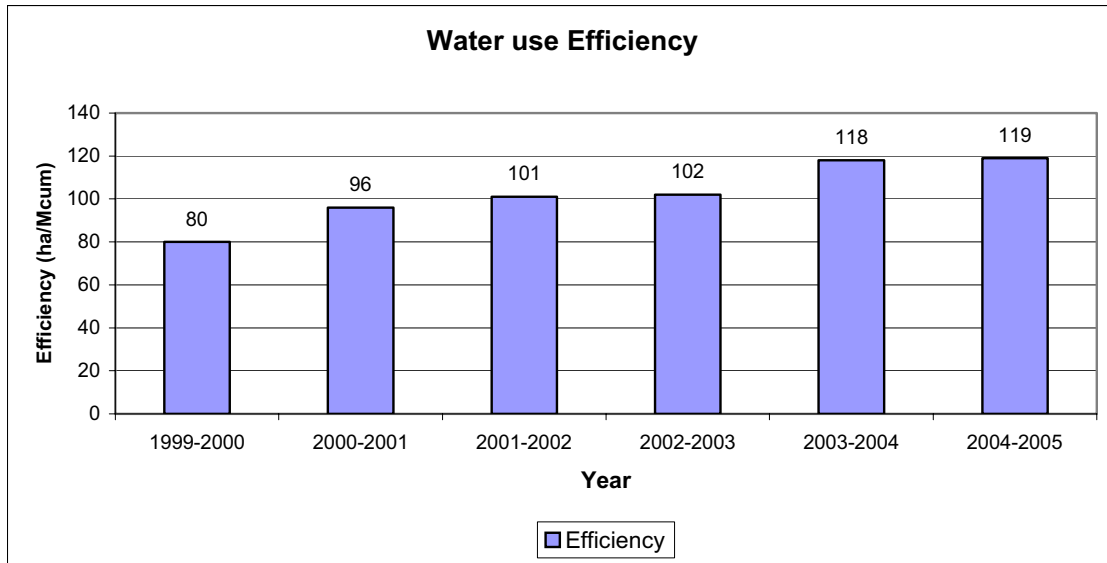
The responsibility of giving project wise water account with WUE at 150 ha/Mcum in Rabi season & 110 ha/Mcum in H.W season was fixed by GOM from December 2001.

It is of utmost importance to use water more efficiently to cater to the needs of a large population. Water use efficiency is a key parameter to be monitored and evaluated. Water use efficiency is a function of agro-climatic conditions, status of irrigation system, soil type, cropping pattern, participation of farmers, irrigation practices etc. Thus efforts are to be made to improve water use efficiency, to achieve more irrigation and crop yield per unit of water.

The useful storage achieved in all Major, Medium and Minor (State sector) reservoirs in the State as on 15<sup>th</sup> October 2004, was 18298 Mcum. Out of the total, water used for irrigation was 10603 Mcum. On account of water use for irrigation, 1.257 Mha area on canals was irrigated whereas irrigation on wells was 0.440 Mha. The total area irrigated by these two sources together was 1.697 Mha. The water use efficiency comes to 119 ha/ Mm<sup>3</sup> for the canal irrigation, which is higher than that for the year 2003-04. It can definitely be said that this value is a satisfactory and target achieving one.

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\* (Status Report published by DIRD-Pune in August 2004)



**5.10.0 Core group for Benchmarking:** It is proposed that, Superintending Engineer in MWIC Office will look after the co-ordination of State level Benchmarking report with the help of field officers, whereas the Chief Engineer- MWIC and Core Group Leader will be the co-ordinating officer for core groups of other State Governments.

The Secretary (CAD), Mantralaya, Mumbai and Adviser to Core Group will keep liaison with Central Government and Core Group of Central Water Commission- New Delhi.



## **APPENDICES**





## Appendix-I

### **Abstract of guidelines issued by GOM for Benchmarking of Irrigation Projects – 2004-05.**

Government of Maharashtra, Water Resources Department vide Letter No. CDA 1004/(369/2004) CAD (works) dated 08.11.2004 issued guidelines while preparing Benchmarking report for the year 2003-04. Subsequently, additional instructions for the year 2004-05 were issued vide letter No. CDA 1004/(369/2004) CAD – works dated 2.9.2005. The abstract of these guidelines is given below:

- 1) Benchmarking shall be taken in hand only after validation of data and linking it with water audit data and data submitted to Government for Irrigation Status Report 2004-05.
- 2) All Projects included in report for 2003-04 be considered for 2004-05.
- 3) Indicators for 2004-05 be the same as for 2003-04. However, financial indicators will be presented for irrigation and non-irrigation uses separately as well as combined.
- 4) In equity performance the Head, Middle and Tail reaches will be decided dividing the command area in to three equal parts.
- 5) Potential Utilised and Created will be linked with availability of water. Effective potential of each project shall be decided based on availability of water for irrigation during the year.
- 6) State Targets shall be decided afresh. The Targets shall be plan-group wise instead of a single target for the whole State.
- 7) Agricultural output shall be calculated at 1998-99 prices.
- 8) In evaluation of performance a category 'Below average' be introduced.
- 9) Cognisance of Irrigation Status Report 2004-05 shall be taken while finalising the data for benchmarking.

The five year average values from 1999-2000 to 2003-04 and values for 2004-05 be considered for comparison, for all the indicators. Absurd (nil or very high values) need not be considered while calculating the average.

Revenue means the actual recovery from Irrigation, non-irrigation water cess, fishery, galper, tourism etc. The assessment figures should not be taken.

While submitting the indicator wise information to the Chief Engineer, Maharashtra Water & Irrigation Commission, Aurangabad, the Superintending Engineers should verify in detail the correctness of the data at their level.

**Appendix-II**  
**State target values for indicators 2004-05**

**I) Annual Irrigation Water Supply per Unit- Irrigated Area:**

Water use efficiency in Rabbi and Hot weather season is 150 ha/Mm<sup>3</sup> and 110 ha/Mm<sup>3</sup> respectively. As there are Rabbi and Hot weather crops in most of the major and medium project, average water use efficiency is  $(150 + 110)/2 = 130$  ha/Mm<sup>3</sup>

Thus the water requirement per unit area =  $100000/130 = 7692$  m<sup>3</sup>/ ha.

In case of minor project as there are no crops irrigated in Hot weather the water requirement per unit area =  $100000/150 = 6666.67$  m<sup>3</sup>/ ha. Say 6667 m<sup>3</sup>/ ha.

Hence in broad sense the water requirement per unit area works out to 7692 m<sup>3</sup> per ha. in case of major and medium projects and 6667 m<sup>3</sup> per ha. in case of minor projects.

**II) Potential Created and utilized:**

Utilization of created potential depends upon availability of water for irrigation. This availability further depends upon available yield & extent of Non Irrigation uses. Therefore, percentage of water available in the reservoir that can be used for irrigation should be the target for the project. The availability of water in different reservoirs is taken from water audit data for the year 2004-05.

**III) Output per unit area :**

The target is decided based on five years experience. The target is set 10 percent higher than average value of output per unit area. While calculating the average value, extreme high or low values are neglected.

The category wise values for different plan groups are as follows.

<b>Plan group</b>	<b>Major</b>	<b>Medium</b>	<b>Minor</b>
Highly deficit	21000	23000	16000
Deficit	23000	25000	21000
Normal	26000	25000	21000
Surplus	25000	31000	27000
Abundant	32000	40000	36000

**IV) Output per unit Water Supply:**

<b>Plan group</b>	<b>Major</b>	<b>Medium</b>	<b>Minor</b>
Highly deficit	2.69	2.80	2.40
Deficit	2.99	3.15	3.15
Normal	3.38	3.15	3.15
Surplus	3.25	4.05	4.05
Abundant	4.16	5.40	5.40

**V) Cost Recovery Ratio:**

Target shall be same for all categories and it shall be 1.

**VI) Total O & M Cost Per Unit Area:**

Total O & M cost includes maintenance cost as well as operation cost of the irrigation system. M & R charges are considered as per Govt. norms and establishment charges are taken for staff working in a section office for irrigation water management.

	<b>Major</b>	<b>Medium</b>	<b>Minor</b>
M & R	200	150	100
Establishment charges	1050	1050	1050
Total	1250	1200	1150

**VII) Total O & M Cost Per Unit Water Supplied:**

Total O & M cost per unit water supplied for irrigation and non-irrigation uses is considered

<b>Major</b>	<b>Medium</b>	<b>Minor</b>
(1250/7692) 0.16	(1200/7692) 0.16	(1150/6667) 0.17

**VIII) Revenue Per Unit of Water Supplied:**

The targets are fixed 10 percent more than O & M cost per unit of water supplied.

<b>Major</b>	<b>Medium</b>	<b>Minor</b>
0.18	0.18	0.19

The State targets for Revenue per unit of water supplied for irrigation is kept as Rs. 0.18/m<sup>3</sup>, however, for NI use the target is Rs. 0.9/ m<sup>3</sup> as charges of NI use are higher than irrigation use.

**IX) Mandays For O & M Per Unit Area:**

The target shall be 3 Mandays / ha as per last year.

**X) Land Damage Index:**

There will be no target for this indicator. However, the percentage of land damaged to total ICA of the project should be minimum for all the projects.

**XI) Equity Performance (head, middle and tail)**

The head, middle and tail portions shall be decided based on dividing the command in to 3 equal parts and not by dividing the length of the canal considered last year.

**XII-I) Assessment Recovery Ratio (Irrigation)**

State target shall be 1

**XII-NI) Assessment Recovery Ratio (Non-Irrigation)**

State target shall be 1

**APPENDIX-III**  
**Evaluation of performance of Irrigation Circles 2004-05**

Indicator No.	Type & Plangroup	State Target	Performance Ranking				
			Below Average	Fair	Moderate	Good	Very good
I	Major, Medium	7692	< 3846 or > 11538	3846 to 5383 or 10001 to 11538	5384 to 6537 or 8847 to 10000	6538 to 7615 or 7769 to 8846	7616 to 7768
	Minor	6667	< 3334 or > 10001	3334 to 4666 8668 to 10000	4667 to 5666 or 7668 to 8667	5667 to 6600 or 6734 to 7667	6601 to 6733
II	All	1	< 0.50	0.50 to 0.69	0.7 to 0.84	0.85 to 0.99	1
III	<b>Major</b>						
	Highly deficit	21000	< 10500	10500 to 14699	14700 to 17849	17850 to 20999	21000 or more
	Deficit	23000	< 11500	11500 to 16099	16100 to 19549	19550 to 22999	23000 or more
	Normal	26000	< 13000	13000 to 18199	18200 to 22099	22100 to 25999	26000 or more
	Surplus	25000	< 12500	12500 to 17499	17500 to 21249	21250 to 24999	25000 or more
	Abundant	32000	< 16000	16000 to 22399	22400 to 27199	27200 to 31999	32000 or more
	<b>Medium</b>						
	Highly deficit	23000	< 11500	11500 to 16099	16100 to 19549	19550 to 22999	23000 or more
	Deficit & Normal	25000	< 12500	12500 to 17499	17500 to 21249	21250 to 24999	25000 or more
	Surplus	31000	< 15500	15500 to 21699	21700 to 26349	26350 to 30999	31000 or more
IV	Abundant	40000	< 20000	20000 to 27999	28000 to 33999	34000 to 39999	40000 or more
	<b>Minor</b>						
	Highly deficit	16000	< 8000	8000 to 11199	11200 to 13599	13600 to 15999	16000 or more
	Deficit & Normal	21000	< 10500	10500 to 14699	14700 to 17849	17850 to 20999	21000 or more
	Surplus	27000	< 13500	13500 to 18899	18900 to 22949	22950 to 26999	27000 or more
	Abundant	36000	< 18000	18000 to 25199	25200 to 30599	30600 to 35999	36000 or more
	<b>Major</b>						
	Highly deficit	2.69	< 1.35	1.35 to 1.88	1.89 to 2.29	2.30 to 2.68	2.69 or more
	Deficit	2.99	< 1.50	1.50 to 2.00	2.01 to 2.53	2.54 to 2.98	2.99 or more
	Normal	3.38	< 1.69	1.69 to 2.36	2.37 to 2.86	2.87 to 3.37	3.38 or more
Surplus	3.25	1.63	1.63 to 2.27	2.28 to 2.75	2.76 to 3.24	3.25 or more	
Abundant	4.16	2.08	2.08 to 2.90	2.91 to 3.53	3.54 to 4.15	4.16 or more	

Indicator No.	Type & Plangroup	State Target	Performance Ranking						
			Below Average	Fair	Modrate	Good	Very good		
IV	<b>Medium</b>								
	Highly deficit	2.99	< 1.50	1.50 to 2.00	2.01 to 2.53	2.54 to 2.98	2.99 or more		
	Deficit & Normal	3.15	< 1.58	1.58 to 2.20	2.21 to 2.67	2.68 to 3.14	3.15 or more		
	Surplus	4.05	< 2.03	2.03 to 2.83	2.84 to 3.43	3.44 to 4.04	4.05 or more		
	Abundant	5.4	< 2.7	2.7 to 3.77	3.78 to 4.58	4.59 to 5.39	5.4 or more		
	<b>Minor</b>								
V	Highly deficit	2.4	< 1.2	1.2 to 1.67	1.68 to 2.03	2.04 to 2.39	2.4 or more		
	Deficit & Normal	3.15	< 1.58	1.58 to 2.19	2.20 to 2.67	2.68 to 3.14	3.15 or more		
	Surplus	4.05	< 2.03	2.03 to 2.83	2.84 to 3.43	3.44 to 4.04	4.05 or more		
	Abundant	5.4	< 2.7	2.7 to 3.77	3.78 to 4.58	4.59 to 5.39	5.4 or more		
	All	1.00	< 0.5	< 0.5 to 0.69	0.7 to 0.84	0.85 to 0.99	1.00 or more		
VI	Major	1250	< 625 or > 1250	625 to 874	875 to 1061	1062 to 1189	1190 to 1250		
	Medium	1200	< 600 or > 1200	600 to 839	840 to 1019	1020 to 1139	1140 to 1200		
	Minor	1150	< 575 or > 1150	575 to 804	805 to 979	980 to 1089	1090 to 1150		
VII	Major, Medium	0.16	< 0.08 or > 0.16	0.09 to 0.11	0.12 to 0.13	0.14 to 0.15	0.16		
	Minor	0.17	< 0.08 or > 0.17	0.09 to 0.11	0.12 to 0.13	0.14 to 0.16	0.17		
VIII	Major, Medium	0.18	< 0.09	0.09 to 0.13	0.14 to 0.16	0.16 to 0.18	>0.18		
	Minor	0.19	< 0.10	0.10 to 0.12	0.13 to 0.15	0.16 to 0.18	0.19 or more		
IX	All	3.00	> 4.5	3.9 to 4.49	3.45 to 3.89	3.00 to 3.44	3.00 or less		
X	All	0	> 3.00	2.00 to 2.9	1.00 to 1.9	0.1 to 1.00	0 to 0.1		
XII (I) & (NI)	All	1.00	< 0.5	0.5 to 0.69	0.7 to 0.84	0.85 to 0.99	1		

**APPENDIX-IV  
Major Projects**

**At a glance evaluation of performance of Irrigation Circles (Service providers) for 2003-04 & 2004-05**

Plan Group	Circle	Indicator Number											
		I		II		III		IV		V		VI	
		2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05
Highly Deficit	CADA Solapur	F	M	BA	BA	F	F	VG	VG	VG	VG	VG	VG
Deficit	AIC Akola	VG	M	BA	BA	F	F	VG	M	VG	F	F	BA
	CADA Aurangabad	BA	BA	BA	BA	F	F	F	VG	BA	VG	VG	BA
	CADA Beed	F	BA	NO IRR	BA	F	BA	M	BA	M	VG	BA	BA
	CADA Jalgaon	BA	F	F	G	M	G	BA	F	BA	VG	G	BA
	NIC Nanded	G	F	F	M	VG	M	G	F	VG	F	BA	BA
	CADA Nashik	BA	F	BA	BA	VG	VG	VG	VG	VG	VG	VG	BA
	UWPC Amravati	G	BA	F	BA	BA	F	BA	F	BA	M	G	F
Normal	AIC Akola	G	NO IRR	BA	NO IRR	F	BA	F	BA	BA	VG	F	BA
	NIC Nagpur	BA	BA	BA	G	BA	BA	BA	BA	BA	VG	VG	BA
	CIPC Chandrapur	F	VG	BA	BA	M	M	F	M	F	BA	BA	BA
	NIC Nanded	M	F	F	VG	VG	VG	VG	VG	BA	BA	BA	BA
	CADA Pune	M	F	F	VG	VG	G	VG	G	VG	F	F	BA
	PIC Pune	F	G	F	G	G	M	F	M	VG	VG	F	F
	UWPC Amravati	BA	BA	BA	BA	G	M	BA	BA	VG	VG	F	M
	CADA Nashik	F	BA	F	F	G	VG	F	F	VG	VG	M	BA
	CADA Jalgaon	G	G	BA	M	VG	VG	VG	VG	VG	VG	BA	BA
Surplus	CADA Nagpur	G	G	M	M	G	G	G	M	VG	VG	F	BA
Abundant	CADA Pune	F	M	M	G	F	F	G	M	VG	VG	BA	BA
	CIPC Chandrapur	F	F	VG	VG	M	M	VG	VG	BA	M	BA	BA
	SIC Sangli	F	F	F	BA	VG	VG	G	VG	VG	VG	F	F
	TIC Thane	BA	BA	BA	BA	VG	VG	BA	BA	VG	VG	M	BA

VG =VERY GOOD, G=GOOD, M=MODERATE, F=FAIR, BA=BELOW AVERAGE, NO IRR=NO IRRIGATION  
NOTE ; The performance is very much affected by availability of water in the reservoirs, which is dependent on rainfall in the year.



**APPENDIX-IV**  
**Major Projects Continued**

Plan Group	Circle	Indicator Number																	
		VII			VIII			IX			X			XII Irr			XII NI		
		2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05
Highly Deficit	CADA Solapur	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
Deficit	AIC Akola	BA	BA	F	VG	VG	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
	CADA Aurangabad	BA	F	VG	VG	VG	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
	CADA Beed	BA	BA	VG	VG	VG	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
	CADA Jalgaon	F	BA	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
	NIC Nanded	M	BA	BA	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
	CADA Nashik	BA	F	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	
	UWPC Amravati	BA	M	BA	M	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
Normal	AIC Akola	F	BA	F	VG	VG	BA	BA	NO IRR	VG	VG	VG	VG	VG	VG	VG	VG	VG	
	NIC Nagpur	BA	BA	VG	VG	VG	NO IRR	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	
	CIPC Chandrapur	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
	NIC Nanded	G	BA	BA	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	
	CADA Pune	BA	BA	BA	BA	BA	M	BA	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	
	PIC Pune	BA	BA	VG	VG	VG	G	VG	VG	VG	M	M	M	BA	BA	BA	BA	BA	
	UWPC Amravati	BA	BA	BA	BA	BA	F	F	F	VG	VG	VG	VG	BA	BA	BA	BA	BA	
	CADA Nashik	F	F	VG	VG	VG	BA	BA	BA	BA	G	G	G	F	F	F	F	F	
	CADA Jalgaon	BA	M	VG	VG	VG	BA	BA	BA	BA	VG	VG	VG	BA	BA	BA	BA	BA	
Surplus	CADA Nagpur	F	G	G	VG	VG	VG	VG	VG	VG	G	G	VG	BA	BA	BA	BA	BA	
Abundant	CADA Pune	F	BA	M	F	VG	VG	VG	VG	VG	M	M	BA	BA	BA	BA	BA	BA	
	CIPC Chandrapur	F	BA	BA	BA	BA	BA	BA	BA	BA	VG	VG	VG	BA	BA	BA	BA	BA	
	SIC Sangli	BA	BA	M	G	VG	VG	VG	VG	VG	G	G	G	BA	BA	BA	BA	BA	
	TIC Thane	F	BA	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	BA	BA	BA	BA	BA	

VG = VERY GOOD, G = GOOD, M = MODERATE, F = FAIR, BA=BELOW AVERAGE, NO IRR= NO IRRIGATION  
NOTE ; The performance is very much affected by availability of water in the reservoirs, which is dependent on rainfall in the year.

### Medium Projects

Plan Group	Circle	At a glance evaluation of performance of Irrigation Circles (Service providers) for 2003-04 & 2004-05																	
		Indicator Number																	
		I		II		III		IV		V		VI							
2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05				
Highly deficit	CADA Solapur	NO IRR	BA	NO IRR	F	NO IRR	VG	NO IRR	VG	NO IRR	VG	BA	BA	NO IRR	BA				
	PIC Pune	M	F	NO IRR	F	NO IRR	VG	NO IRR	VG	NO IRR	VG	BA	BA	NO IRR	BA				
Deficit	CADA Beed	M	M	NO IRR	BA	NO IRR	M	NO IRR	VG	NO IRR	F	BA	BA	NO IRR	F				
	CADA Beed	VG	F	NO IRR	M	NO IRR	M	NO IRR	VG	NO IRR	VG	VG	VG	BA	G				
	CADA Nashik	BA	M	NO IRR	BA	NO IRR	VG	NO IRR	VG	NO IRR	VG	BA	BA	F	M				
	NIC Nanded	VG	M	NO IRR	BA	NO IRR	G	NO IRR	VG	NO IRR	VG	F	M	G	BA				
	CADA Abad	VG	G	NO IRR	BA	NO IRR	G	NO IRR	VG	NO IRR	VG	F	G	F	BA				
	BIPC Buldhana	M	G	NO IRR	BA	NO IRR	M	NO IRR	F	NO IRR	F	VG	VG	BA	BA				
	CADA Jalgaon	G	G	NO IRR	BA	NO IRR	M	NO IRR	F	NO IRR	F	BA	BA	NO IRR	BA				
	AIC Akola	M	F	NO IRR	BA	NO IRR	VG	NO IRR	VG	NO IRR	VG	M	BA	BA	BA				
Normal	CADA Abad	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR				
	YIC Yeotmal	G	NO IRR	NO IRR	NO IRR	NO IRR	F	NO IRR	F	NO IRR	F	NO IRR	NO IRR	M	NO IRR				
	NIC Nanded	G	BA	NO IRR	BA	NO IRR	VG	NO IRR	F	NO IRR	VG	G	BA	F	BA				
	CADA Nagpur	G	BA	NO IRR	VG	NO IRR	BA	NO IRR	BA	NO IRR	VG	F	VG	M	BA				
	AIC Akola	G	BA	NO IRR	BA	NO IRR	G	NO IRR	BA	NO IRR	G	F	BA	BA	BA				
	PIC Pune	VG	M	NO IRR	BA	NO IRR	VG	NO IRR	VG	NO IRR	VG	VG	VG	G	BA				
	CIPC Chandrapur	F	G	NO IRR	F	NO IRR	BA	NO IRR	G	NO IRR	G	VG	VG	F	BA				
	CADA Jalgaon	G	G	NO IRR	F	NO IRR	G	NO IRR	VG	NO IRR	VG	BA	BA	M	BA				
	CADA Nashik	G	G	NO IRR	BA	NO IRR	G	NO IRR	G	NO IRR	G	VG	VG	F	BA				
	CADA Beed	NO IRR	BA	NO IRR	BA	NO IRR	VG	NO IRR	G	NO IRR	G	NO IRR	BA	NO IRR	G				
Surplus	CADA Nagpur	F	BA	NO IRR	VG	NO IRR	M	NO IRR	F	NO IRR	VG	BA	BA	F	M				
	CIPC Chandrapur	F	G	NO IRR	VG	NO IRR	VG	NO IRR	M	NO IRR	VG	BA	BA	BA	F				
Abundant	CIPC Chandrapur	G	F	NO IRR	VG	NO IRR	VG	NO IRR	M	NO IRR	VG	BA	BA	BA	F				
	SIC Sangli	M	G	NO IRR	BA	NO IRR	VG	NO IRR	F	NO IRR	M	M	M	M	BA				
	TIC Thane	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA				
	KIC Ratnagiri	BA	BA	NO IRR	BA	NO IRR	VG	NO IRR	BA	NO IRR	BA	BA	BA	BA	BA				

VG = VERY GOOD, G = GOOD, M = MODERATE, F = FAIR, BA=BELOW AVERAGE ,

NO IRR= NO IRRIGATION, NR= NO RECOVERY

NOTE ; The performance is very much affected by availability of water in the reservoirs, which is dependent on rainfall in the year.

**Medium Projects continued**

Plan Group	Circle	Indicator Number																	
		VII			VIII			IX			XII Irr			XII NI					
		2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05				
Highly deficit	CADA Solapur	NO IRR	BA	NO IRR	M	NO IRR	BA	NO IRR	BA	NO IRR	M	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA
	PIC Pune	BA	BA	VG	BA	BA	BA	BA	BA	NO IRR	F	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA
	CADA Beed	BA	F	VG	BA	VG	BA	VG	BA	NO IRR	NO IRR	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA
Deficit	CADA Beed	G	G	G	G	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
	CADA Nashik	M	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
	NIC Nanded	N	BA	BA	M	BA	BA	BA	BA	F	BA	BA	BA	BA	BA	BA	BA	BA	M
Normal	CADA Abad	BA	M	BA	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
	BIPC Buldhana	BA	BA	M	VG	VG	VG	VG	VG	M	M	M	M	M	NR	NR	NR	NR	VG
	CADA Jalgaon	VG	BA	BA	BA	BA	BA	BA	BA	F	F	F	F	F	BA	BA	BA	BA	F
Surplus	AIC Akola	BA	BA	VG	VG	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
	CADA Abad	NO IRR	F	NO IRR	BA	NO IRR	BA	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NR
	YIC Yeotmal	M	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
Abundant	NIC Nanded	F	BA	BA	BA	BA	BA	BA	BA	G	F	F	F	F	BA	BA	BA	BA	F
	CADA Nagpur	BA	BA	BA	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA
	AIC Akola	BA	BA	F	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	VG	G
Surplus	PIC Pune	G	BA	VG	F	BA	BA	BA	BA	BA	G	G	G	G	G	G	G	G	M
	CIPC Chandrapur	G	BA	VG	VG	VG	VG	VG	VG	BA	BA	BA	BA	BA	BA	BA	BA	BA	G
	CADA Jalgaon	M	G	BA	BA	BA	BA	BA	BA	F	G	G	G	G	F	F	F	F	BA
Surplus	CADA Nashik	F	BA	F	BA	F	BA	F	BA	BA	VG	VG	VG	M	NR	NR	NR	NR	NR
	CADA Beed	NO IRR	F	NO IRR	BA	NO IRR	BA	NO IRR	VG	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NR
	CADA Nagpur	G	BA	BA	F	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	G
Abundant	CIPC Chandrapur	BA	F	BA	BA	BA	BA	BA	BA	M	M	M	M	M	NR	NR	NR	NR	F
	CIPC Chandrapur	BA	BA	BA	BA	BA	BA	BA	BA	VG	F	F	F	F	NR	NR	NR	NR	VG
	SIC Sangli	F	G	BA	F	BA	BA	BA	BA	VG	BA	BA	BA	BA	F	F	F	F	BA
Surplus	TIC Thane	NO IRR	BA	NO IRR	BA	NO IRR	BA	NO IRR	VG	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NR
	KIC Ratnagiri	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	BA	G

VG = VERY GOOD, G = GOOD, M = MODERATE, F = FAIR, BA=BELOW AVERAGE

NO IRR= NO IRRIGATION, NR= NO RECOVERY

NOTE ; The performance is very much affected by availability of water in the reservoirs, which is dependent on rainfall in the year.

**Minor Projects  
At a glance evaluation of performance of Irrigation Circles (Service providers) for 2003-04 & 2004-05**

Plan Group	Circle	Indicator Number											
		I		II		III		IV		V		VI	
		2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05	2003-04	2004-05
Highly Deficit	CADA Solapur	NO IRR	BA	NO IRR	VG	NO IRR	VG	BA	VG	BA	VG	BA	BA
	CADA Beed	NO IRR	VG	NO IRR	BA	NO IRR	BA	BA	F	NO IRR	BA	NO IRR	BA
Deficit	AIC Akola	G	BA	BA	VG	VG	VG	VG	VG	VG	VG	BA	BA
	CADA Beed	F	F	BA	BA	VG	BA	VG	M	BA	BA	BA	BA
	BIPC Buldhana	M	F	BA	G	VG	VG	VG	VG	G	BA	BA	VG
	CADA Jalgaon	M	M	M	G	F	M	M	VG	BA	BA	BA	G
	NIC Nanded	F	M	BA	BA	VG	F	M	M	F	BA	F	BA
	CADA Nashik	NO IRR	F	NO IRR	BA	NO IRR	F	BA	BA	NO IRR	BA	NO IRR	BA
	CADA Aurangabad	F	BA	BA	BA	VG	VG	VG	F	BA	BA	F	BA
Normal	AIC Akola	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR	BA	NO IRR	NO IRR	NO IRR	NO IRR	NO IRR
	YIC Yavatmal	M	NO IRR	BA	NO IRR	M	NO IRR	F	NO IRR	BA	NO IRR	F	NO IRR
	CADA Nagpur	BA	BA	M	VG	VG	VG	VG	VG	BA	BA	G	BA
	NIC Nanded	M	M	BA	BA	VG	F	VG	G	BA	BA	BA	BA
	PIC Pune	M	VG	M	VG	F	F	M	F	F	VG	BA	BA
	CIPC Chandrapur	BA	VG	VG	F	BA	VG	F	VG	VG	F	BA	BA
	CADA Nashik	G	VG	BA	F	VG	VG	VG	VG	BA	BA	F	M
	CADA Pune	G	BA	BA	BA	M	M	F	BA	F	BA	BA	M
Surplus	CADA Nagpur	BA	BA	F	M	BA	M	F	VG	G	BA	BA	BA
Abundant	SIC Sangli	BA	BA	BA	BA	F	BA	BA	BA	NO IRR	BA	BA	BA
	CIPC Chandrapur	G	BA	VG	F	BA	F	BA	BA	BA	BA	F	BA
	TIC Thane	BA	BA	F	F	F	F	BA	BA	BA	BA	BA	BA
	KIC Ratnagiri	BA	BA	BA	BA	VG	VG	VG	VG	BA	BA	BA	G
	NKIPC Thane	BA	BA	BA	BA	VG	VG	BA	BA	BA	BA	BA	BA

VG=VERY GOOD, G=GOOD, M=MODERATE, F=FAIR, BA=BELOW AVERAGE, NO IRR=NO IRRIGATION  
 NOTE ; The performance is very much affected by availability of water in the reservoirs, which is dependent on rainfall in the year.



**Appendix-V**

**Overview of Projects selected for Benchmarking (Major Projects)**

Plan Group /SB No	Circle/ Project	Avg. Annual Rainfall mm	Designed			Year of Commencement of Irrigation	Culturable Command Area Ha	Irrigable command area Ha	Max.Live Storage observed during 2004-05	No. of villages in benefit zone	Avg. farm size Ha	Main crops	Area covered under WUA Ha	
			Live Storage Mm <sup>3</sup>	Water use for Irrigation Mm <sup>3</sup>	Water use for Non irrigation Mm <sup>3</sup>								Proposed	Handed over
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>Highly deficit</b>														
<b>CADA Solapur</b>														
18AA	Bhima	500	1517.20	1444.70	116.43	1977	198035	182683	1517.20	384	1 to 2.5	Sorghum, Wheat, Groundnut, Sugarcane	119609	19472
<b>Deficit</b>														
<b>AIC Akola</b>														
10	Katepurna	950	86.35	49.45	32.65	1972	11187	8325	2.34	30	1.5 to 2	Wheat, Peas, Cotton, Sunflower.	11187	6050
10	Nalganga	737	69.32	53.21	6.51	1963	9165	8604	24.86	31	1 to 2	Gram, Wheat, Cotton	9165	4535
<b>CADA Aurangabad</b>														
2	Jayakwadi (PLBC)	755	2171.00	1064.96	329.04	1975-76	183560	141640	2129.14	355	1.5 to 2	Cotton, Wheat, Sorghum, Sunflower	113914	20336
<b>CADA Beed</b>														
2	Jayakwadi (PRBC)	700	2171.00	331.39	29.68	1976-77	53910	41682	2129.14	99	1.57	Cotton,Wheat,Sorghum, Sugarcane	17900	5132
2	Majalgaon	840	312.00	680.28	46.88	1989-90	64295	54737	0.00	132	1 to 2	Wheat, Sorghum, Cotton, Sugarcane	17900	5132
4	Manjira	685	173.32	185.64	85.67	1980-81	23690	18223	0.00	80	2.03	-d-	1639	1239
4	Lower Terna	710	113.95	62.50	21.05	1997-98	14513	11610	0.00	63	1 to 1.5	Sorghum, Wheat, Sunflower, Groundnut, Gram	ND	
<b>CADA Jalgaon</b>														
11	Gina	743	523.55	549.66	0	1962-63	79293	69350	523.55	195	3	Sugarcane, Banana, Cotton, Wheat, Sorghum	15936	116
<b>CADA Nashik</b>														
11	Chankapur	1067	76.85	146.59	0	1973	19173	14042	76.85	48	0.5	Bajri, Two seasonals, Paddy, Sorghum, Groundnut, Wheat, Gram	1861	0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>NIC Nanded</b>														
2	Vishnupuri	910	81.37	275.18	54.37	1990	37785	28340	80.79	46	2.06	-do-	605	0
3	Purna	685	809.77	732.33	68.67	1968-69	78485	57988	51.51	232	1 to 2	Cotton, Wheat, Sorghum	22764	4486
4	Manar	850	128.68	198.06	5.94	1968	27745	23310	95.15	96	1.55	Wheat, Gram, Sugarcane, Cotton, Groundnut, Sorghum	3682	3682
<b>UWPC Amravati</b>														
10	Wan	891	81.96	78.57	20.08	1998-99	22525	15100	30.76	54	1.5	-do-	22525	4808
<b>Normal</b>														
<b>AIC Akola</b>														
6	Arunawati	913	169.67	121.65	15.62	1995	24135	20515	7.07	73	2 to 3	Cotton, Wheat, Sugarcane	23805	366
6	Pus	945	91.26	100.35	19.06	1972	13678	8215	7.14	40	1.5 to 3	Sugarcane, Sorghum, Wheat, Gram, Cotton, Groundnut.	9947	0
<b>CADA Jalgaon</b>														
13	Hatnur	743	255.00	500.12	90.53	1983	47360	37838	255.00	82	1.2	Sugarcane, Banana, Groundnut	7282	0
<b>CADA Nashik</b>														
1	Bhandardara	3175	304.10	419.00	0	1926	63740	23077	304.10	110	4 to 5	Sorghum, Wheat, Grass, Maize, Sunflower, Sugarcane	6603	0
1	Mula	500	608.89	540.27	87.90	1972	138792	82920	608.89	160	4 to 5	Wheat, Sorghum, Gram	37852	27897
1	Ozerkhed	746	60.32	31.59	2.19	1985	14856	10400	60.30	35	0.8	Gram, Sorghum	7114	2143
1	Paikhed	661	187.47	82.90	46.85	1976	60704	43154	21.23	144	0.8	Paddy, Onion, Vegetables, Groundnut, Bajri, Wheat, Gram, Sorghum	48309	14144
1	Waghad	964	72.23	36.53	3.50	1981	9642	6750	72.20	23	0.6	Groundnut, Bajri, Wheat, Gram, Sorghum	9857	7143
1	Dama	550	202.40	135.73	66.67	1918	88822	33170	610.66	146	2	Sugarcane, Sorghum, Bajri, Wheat, Gram, Fruits	8235	5717
1	Gangapur	500	203.85	86.78	117.07	1954	21900	15960		92	1.3	-do-	2806	531
1	Kadwa	533	52.90	61.96	8.46	1997	15523	10117	52.90	42	0.47	-do-	465	345

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	<b>CADA Pune</b>													
17	Kukadi	790	864.64	951.29	0	1978	224699	156278	729.97	269	0.8 to 1	Wheat, Sorghum, Bajri, Vegetables, Sugarcane, Groundnut, Gram	43003	26369
17	Ghod	515	154.80	202.86	2.54	1965	41460	20500	154.80	54	1	Sugarcane, Sorghum, Bajri, Wheat, Grain	3734	0
	<b>CIPC Chandrapur</b>													
7	Bor	1327	127.42	109.29	6.35	1967	24055	13360	41.42	77	1.5 to 2	Cotton, Wheat	23003	7772
7	<b>NIC Nagpur</b>													
	Lower Wunna	1330	189.18	148.00	29	1991	21591	19500	159.77	109	2.5	Cotton, Wheat, Gram, Soybean, Sugarcane	17325	413
	<b>NIC Nanded</b>													
6	Upper Penganga	825	964.09	782.69	15.16	1984-85	139438	125495	137.10	356	1 to 2	Cotton, Wheat, Sorghum,	21170	7355
	<b>PIC Pune</b>													
17	Khadakwasla	911	712.00	602.55	204	1970	83302	62146	712.00	96	0.5 to 5	Sorghum, Bajri, Maize, Wheat, Sugarcane	4840	958
17	Pawana	2210	274.00	96.50	168.32	1975	7468	6365	230.57	30	0.5 to 2.5	Paddy, Sorghum, Bajri, Maize, Wheat, Sugarcane	ND	
18	Bhatghar Dam N.L.B.C.	1953	666.00	386.58	33.92	1893	68767	60656	666.00	87	1 to 2	Sorghum, Wheat, Bajri, Sugarcane	3439	2465
18	N.R.B.C. (Veer Dam)	1067	266.44	860.99	0	1938	181266	65506	266.44	214	1.7	Sugarcane, Sorghum, Bajri, Wheat, Other Perennials		
	<b>UWPC Amravati</b>													
7	Upper Wardha	840	614.79	302.78	99.72	1994-95	83300	75000	514.21	279	1.5	Cotton, Wheat, Hy. Jowar, Chilli, Groundnut	83300	0
	<b>Surplus</b>													
	<b>CADA Nagpur</b>													
8	Bagh Sirpur	1325	268.96	214.44	0	1971	0	0	113.85	0	1 to 2	-do-	29703	0
8	Pench	1138	180.00	689.00	243	1976	126913	101200	432.22	407	1 to 2	Paddy, Cotton, Chilly, Wheat, Gram, Sunflower, Soybean	126913	3130
8	Itiadhoh	1336	318.86	412.04	0	1971	22752	17500	121.79	100	1 to 2	Paddy	22752	0
	<b>Abundant</b>													
	<b>CADA Pune</b>													
15	Krishna	872	602.73	602.73	0	1978-85	81400	74000	601.18	146	1 to 2	Sugarcane, Sorghum, Wheat, Gram	26950	7310



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	CIPC Chandrapur													
9	Asolamendha	1147	56.37	52.00	0	1918	37945	9919	33.61	67	1.5 to 2	Paddy	10317	0
9	Dina	1315	55.94	55.94	0	1974	12494	7826	55.94	66	1.5 to 2	-do-	12494	0
	<b>SIC Sangli</b>													
15	Radhanagari	3638	219.97	203.87	24.35	1955	35422	26560	219.97	91	0.5 to 1.5	Sugarcane, Paddy, Wheat, Vegetables	47288	366
15	Tulashi	1870	89.31	91.92	42.50	1978	5711	4720	91.92	23	0.5 to 2	-do-	4495	0
15	Warma	2092	779.35	578.05	6.46	1986-87	123463	96919	779.35	332	0.8	-do-	148972	0
15	Dudhganga	2636	679.11	622.11	57	1993-94	46976	38388	679.11	125	1 to 2	Sugarcane, Paddy, Wheat	61032	2000
	<b>TIC Thane</b>													
21	Surya	2286	176.48	145.42	31.06	1981-82	30547	14696	176.48	64	0.25	Paddy	400	0
21	Bhatsa	2589	942.10	511.86	389.03	1985-86	29378	23000	711.86	149	0.39	-do-	ND	
21	Rajanala	3461	339.140	32.00	0.00	1958-59	3050	2542	264.35	35	0.20	Paddy	400	
22	Kal	3020	522.76	156.41	54.70	1973-74	9558	7965	443.67	127	0.20	-do-	351	0
	ND= No Data													

Plan group/ SB No	Circle/ Project	Avg. Annual Rainfall (mm)	Designed Live Storage (Mm <sup>3</sup> )	Designed Water use for Irrigation (Mm <sup>3</sup> )	Designed Water use for Non irrigation (Mm <sup>3</sup> )	Year of Commencement of Irrigation	Culturable Command Area (ha)	Irrigable command area (ha)	Max.Live Storage observed during 2004-05	Total No. of farmers benefit zone	No. of villages in size (ha)	Avg. farm size (ha)	Main crops	Area covered under WUA (ha)		
														Proposed	Handed over	
														1	2	3
<b>Highly Deficit</b>																
<b>CADA, Beed</b>																
19	Banganga	685	4.93	6.35	0.59	1975	964	906	ND	545	5.00	1 to 3	Groundnut, Sorghum, Sunflower, Wheat	0		
19	Chandani	770	18.29	20.59	3.11	1966	2891	2024	ND	1716	10.00	2 to 3	Sorghum, Sunflower, Wheat, Pulses	344	0	
19	Ekrugh	500	61.16	43.21	15.95	1871	6858	2610	26.36	2000	11	1 to 1.5	Sorghum, Wheat, Vegetables, Sugarcane	No Data	No Data	
19	Jakapur	770	7.43	7.43	0.00	1979	1600	1584	ND	1500	4.00	2 to 3	-do-	No Data	No Data	
19	Kada	589	8.56	8.38	0.18	1970	1804	12214	2.11	1407	5.00	1 to 1.5	Sorghum, Wheat, Groundnut, Sugarcane, Maize, Sunflower	No Data	No Data	
19	Kadi	589	5.47	5.47	0.00	1965	1190	1084	0.00	578	4.00	0.5 to 4	Sorghum, Wheat, Groundnut, Sugarcane, Sunflower	0		
19	Kambli	589	3.1	3.10	0.00	1958	1047	972	2.42	1013	5.00	1 to 1.5	Sorghum, Wheat, Groundnut, Sugarcane, Maize, Sunflower	No Data	No Data	
19	Khasapur	770	13.04	13.30	2.55	1954	3575	2146	ND	1372	15.00	2 to 3	Sorghum, Wheat, Sunflower	0		
19	Khendeshwar	685	7.85	11.28	0.00	1981	1710	1471	ND	810	10.00	1 to 3	Groundnut, Sorghum, Sunflower, Wheat	0		
19	Kurnoor	770	32.28	32.18	4.81	1968	6414	3644	ND	4331	9.00	2 to 3	Groundnut, Sorghum, Wheat, Sugarcane, Maize, Sunflower	270	270	
19	Mehakari	589	12.98	12.98	0.00	1966	5007	4048	0.00	2780	8.00	1 to 1.5	Sorghum, Wheat, Sunflower, Wheat, Sugarcane, Maize, Groundnut	617	0	
19	Ramganga	685	5.34	6.50	0.00	1977	1017	963	ND	585	7.00	1 to 3	Sunflower, Groundnut, Sorghum, Wheat	0		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
19	Rooty	589	6.57	6.09	0.48	1938	1943	1862	ND	1059	5.00	1 to 1.5	Sorghum, Wheat, Vegetables, Sugarcane	0		
19	Sakat	770	13.48	15.17	0.00	1994	3140	2355	ND	923	9.00	2 to 3	Sugarcane	800	0	
19	Talwar	589	3.23	3.23	0.00	1960	760	668	ND	530	4.00	0.5 to 1.5	Sorghum, Wheat, Groundnut, Sugarcane, Maize, Sunflower	0		
19	Turori	770	5.73	5.73	1.70	1984	900	830	ND	900	8.00	2 to 3	-do-	No Data	No Data	
<b>CADA Solapuri</b>																
18 AA	Buddhinal	500	19.03	15.08	0.00	1966	5448	4251	1.88	1883	8	0.5 to 1.5	Sorghum, Wheat, Groundnut, Sugarcane, Maize, Sunflower	4251		
19	Hingni (P)	500	31.97	37.83	1.68	1977	6482	5629	2.44	5000	15	1 to 1.5	-do-	0		
19	Javalgon	500	29.18	29.37	6.15	1997	5372	5341	5.56	4500	13	1 to 1.5	-do-	1200		
18 AA	Padawaikar wadi	500	2.12	2.12	0.00	1973	458	352	0.00	250	2	1 to 1.5	-do-	352	No Data	
<b>PIC Pune</b>																
19	Khairy	682	13.74	17.83	0	1989	2718	2318	4.94	1150	14	2	Sorghum, Bajri, Wheat, Groundnut	1357	0	
16	Nher	508	11.79	11.79	0	1886	4324	2636	11.79	3440	18	1	Bajari, Sorghum, Wheat other Non Perennial	725	0	
19	Sina	562	52.3	67.09	0.2	1984	9677	8445	37.04	9500	26	1	Sorghum, Bajri, Wheat, Maize, Kadwal	1430		
<b>Deficit</b>																
<b>AIC Akoli:</b>																
10	Dnyanganga	732	33.93	33.80	8.69	1971	4494	4249	6.48	2962	21	1.5 to 2	Wheat, Gram, Cotton	4494	158	
10	Mas	696	15.04	21.48	8.09	1982	6107	4415	4.50	2900	22	2 to 3	-do-	4381	0	
11	Morna	827	41.46	46.50	0.00	1972	6464	4633	2.61	2228	29	1 to 3	Wheat, Gram, Cotton, Hy.Jawar	6532	1989	
11	Nirguna	812	28.85	34.50	0.00	1979	6377	5836	3.37	4574	20	1 to 2	Wheat, Gram, Cotton, Hy.Jawar, Groundnut	6377	2422	
10	Paldhag	766	7.51	10.40	0.37	1978	3082	1932	2.14	1534	14	1 to 2	Wheat, Gram, Cotton	3032	72	
10	Shahanur	1440	46.04	41.12	12.45	1990	9330	7466	17.90	7347	47	1.27	Cotton, Sorghum, Wheat, Gram, Orange	9330	0	
10	Sonal	860	16.92	17.95	0.00	1981	3496	2447	0.00	2347	46	1 to 2	Hy. Jawar, Sunflower, Cotton, Wheat, Gram	3293	764	
10	Uma	818	11.68	10.23	0.92	1982	3007	2241	0.10	1996	21	1 to 3	Wheat, Gram, Cotton, Hy.Jawar	3007	267	

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	<b>BIPC Buldhana</b>														
10	Mun	761	36.83	45.10	0.00	1992-93	9735	7804	7.79	2782	32	2.5	Cotton, Chilly, Sunflower	8714	0
10	Toma	711	7.9	7.75	0.11	1984-95	1725	1465	2.04	753	7	2.5	-do-	1428	0
	<b>CADA Aurangabai</b>														
11	Ajintha Andhari	650	7.65	5.27	2.38	1984	1967	1578	1.29	500	3	3.93	-do-	294	0
3	Dhamna	677	8.49	8.34	0.15	1973	1682	1280	3.67	510	8	2.5	-do-	696	0
11	Gadadgad	840	4.64	3.97	0.67	1971	1448	1180	2.16	820	4	1.77	-do-	1449	1449
2	Gaihati	598	13.84	7.08	4.34	1964	2812	2200	13.84	1200	12	1 to 2	Sorghum, Wheat, Cotton, Tur	No Data	No Data
3	Girija	762	21.23	14.66	6.57	1990	3443	3443	0.00	4447	10	0.77	-do-	2309	278
3	Jivrekha	668	6.14	6.14	0.00	1964	2589	1064	3.87	908	6	2.5	-do-	1318	0
3	Jui	647	8.22	6.22	2.00	1960	2636	2206	1.74	880	14	2.5	-do-	434	0
3	Kalyan	567	10.48	7.35	3.03	1986	2693	2020	0.00	800	9	3	-do-	850	0
3	Kalyan Girija	663	8.42	8.42	0.00	1972	1557	1377	1.84	420	9	3	Wheat, Sorghum, Sunflower	1655	0
3	Karpata	760	24.9	21.03	2.80	1974	2862	2151	3.32	1980	7	1.5	-do-	No Data	No Data
3	Khelna	650	11.07	4.74	6.33	1967	4935	2429	10.53	1210	11	4.08	-do-	590	0
3	Lahuki	688	5.31	3.72	1.59	1977	1323	1092	0.00	1384	4	0.96	-do-	484	0
2	Masoli	780	27.37	23.44	3.94	1982	3502	2591	9.34	2067	7	1.5	-do-	733	438
3	Sukhana	688	18.49	16.56	1.93	1968	3136	2511	5.60	1150	14	2.73	-do-	1735	0
	<b>CADA Beed</b>														
4	Devarjan	838	10.680	7.12	0.00	1997	2853	1882	2.96	920	7	2.04	Sorghum, Wheat, Gram, Sunflower	No Data	No Data
4	Gharni	716	22.460	23.78	0.00	1969	3542	2834	22.45	1347	14	2.10	Sugarcane, Groundnut, Sorghum, Cotton, Maize, Paddy, Vegetable, Wheat, Gram	2834	No Data
2	Kundlika	753	37.690	37.83	0.33	1988	3927	2964	34.26	1009	13	3.91	Sugarcane, Groundnut, Sorghum, Bajri, Cotton, Sunflower	287	287
4	Masalga	673	13.590	11.54	0.00	1996	1678	1364	0.00	790	11	1.73	Sorghum, Bajri, Cotton, Sunflower, Groundnut	800	No Data
4	Raigavhan	770	11.259	8.57	0.28	1992	2267	1700	1.47	1261	8	1.30	-do-	620	No Data
4	Rui	770	8.605	5.80	1.72	1994	1893	1650	1.90	250	7	1.20	-do-	No Data	No Data
4	Sakol	850	10.840	8.40	0.00	1996	2174	2064	4.34	945	7	2.18	Sorghum, Chilli, Groundnut, Maize, Paddy, Vegetables, Wheat, Gram	No Data	No Data
4	Tavarja	744	20.340	10.98	3.92	1983	4907	3603	2.28	2105	19	1.72	Sorghum, Sunflower, Wheat	No Data	No Data
4	Terna	770	19.663	10.84	4.81	1964	1928	1652	8.68	1469	9	1.50	Sugarcane	100	0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Tiru	684	15.290	21.19	0.00	1978	2654	2348	8.03	1741	14	1.40	Sorghum, Chilli, Groundnut, Maize, Paddy, Vegetables, Wheat, Gram	2625	2625
4	Vhati	880	8.270	9.93	0.00	1983	1809	1760	0.98	829	7	2.15	Sorghum, Chilli, Groundnut, Maize, Paddy, Vegetables, Wheat, Gram, Fodder	1076	No Data
4	Wan	533	19.37	19.31	7.64	1967	7125	5262	15.86	4630	22	1.54	Sorghum, Wheat, Sunflower, Cotton, Groundnut	265	0
<b>CADA Jalgaor</b>															
11	Agnawati	743	2.76	2.90	0.58	1987	960	605	2.76	375	3	0.75	-do-	480	0
13 AA	Bhokarbari	694	6.54	8.15	0.00	1993-94	1790	1205	1.76	603	5	1.5	-do-	No Data	No Data
13 AA	Bori	694	25.15	31.30	7.08	1985-76	6504	4553	2.11	2277	15	2	-do-	839	0
13 AA	Burai	500	14.21	19.23*	0.87	1984-85	2981	2760	0.67	2524	5	1	Wheat, Cotton, Gram, Bajri, Sorghum, Onion, Maize	1297	155
13 AA	Kanoli	660	8.45	10.50	0.00	1974-75	1620	1363	3.75	1500	8	1 to 2	Wheat, Cotton, Gram, Bajri, Sorghum	449	0
11	Hiwara	810	3.6	12.30	0.00	1997	2923	2231	9.60	608	3	0.8	-do-	1580	0
11	Manyad	750	40.27	45.30	0.00	1973-74	6500	4864	40.27	4245	12	2	Sugarcane, Banana, Cotton	1908	0
13 AA	Rangavali	1055	12.89	23.05*	0.00	1983-84	5130	3134	12.89	1400	21	2 to 2.5	Sorghum, Wheat, Cotton, Vegetables	1261	0
13 AA	Tondapur	763	4.63	4.77	0.85	1998	1597	1060	4.64	712	2	0.8	-do-	380	0
<b>CADA Nashit</b>															
4	G.Pargaon	685	8.5	12.36	0.00	1984	2142	1660	0.00	1792	15	3 to 4	-do-	747	0
11	Haranbari	795	33.02	47.66	0.00	1988-89	12966	9726	33.02	11150	55	0.5	Paddy, Sorghum, Groundnut, Wheat, Gram, Sugarcane	632	491
11	Keizar	687	16.2	16.51	0.00	1988-89	5583	3394	16.22	2594	19	0.5	Bajri, Two seasonal, Paddy, Sorghum, Groundnut, Wheat, Gram	672	630
11	Nagya Sakya	528	11.24	13.72	0.00	1992.93	2400	2400	11.24	2125	11	0.5	Paddy, Sorghum, Groundnut, Wheat, Gram, Sugarcane	0	0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	<b>NIC Nanded</b>														
4	Karadkhed	650	11.01	11.34	6.56	1976	2510	1780	6.59	1298	11	1.93	-do-	2509	1652
2	Kudala	700	4.35	5.54	1.38	1974	676	567	2.05	428	5	1.23	-do-	No Data	No Data
4	Kundrala	630	10.41	12.81	4.21	1981	1265	1012	3.65	784	7	1.61	Wheat, Gram, Sugarcane, Cotton, Groundnut, Sorghum	1277	1277
4	Loni	1150	8.38	9.51	0.91	1981	1835	1377	5.36	1788	7	1.02	-do-	No Data	No Data
4	Mahalingi	775	4.78	4.06	1.68	1980	1015	784	0.00	568	6	1.8	-do-	1449	784
4	Pethwadaj	850	9.04	13.52	1.31	1977	1970	1478	9.04	1985	13	1	-do-	No Data	No Data
<b>Normal</b>															
<b>AIC Akolk</b>															
6	Adan	798	67.25	69.67	11.14	1979	10067	7804	1.25	14000	32	0.56	Cotton, Tur, Sugarcane, Groundnut	10067	0
6	Borgaon	988	6.61	10.86	0.35	1992	3028	2271	2.11	980	16	1.5 to 3	Groundnut, Cotton, Sorghum, Wheat, Gram, Pulses	3028	1011
6	Ekburji	986	11.97	9.08	0.76	1984	2625	2429	3.13	1700	11	1 to 2	Wheat, Gram	2625	0
6	Koradi	660	15.12	15.12	0.00	1981	5067	4061	3.19	4125	26	1 to 2	Cotton, Sorghum, Wheat, Groundnut	2830	127
6	Lower Pus	852	59.63	70.50	2.42	1990	7606	6600	0.00	1653	29	2 to 4	Sugarcane, Cotton, Sorghum, Wheat, Gram, Pulses, Vegetables	6950	0
6	Saikheda	1098	27.18	24.77	4.38	1972	3895	3116	12.89	1132	18	1.5 to 3	Cotton, Sorghum, Wheat, Gram, Pulses, Vegetables	3239	0
<b>CADA Aurangabai</b>															
1	Ambadi	650	9.42	6.92	2.50	1979	2375	2147	0.99	1050	10	2.26	-do-	1467	0
1	Dheku	600	12.15	6.55	5.60	1961	3564	2712	4.58	1725	15	2.07	-do-	580	0
1	Kolhi	600	3.23	2.63	0.60	1967	1056	472	0.00	350	4	3.02	-do-	472	0
<b>CADA Beed</b>															
18	Khandala	770	5.24	5.24	0.00	1974	1328	830	ND	1300	2.00	2 to 3	-do-	No Data	No Data
<b>CADA Jalgaon</b>															
13 A	Abhora	750	6.02	7.13	0.00	1985	1403	1115	6.02	450	2	0.8	-do-	580	0
13 A	Aner	970	59.2	79*	8.50	1976	9201	7180	59.20	3402	10	0.5	Wheat, Groundnut, Cotton	2154	0
13 A	Karvand	960	21.39	21.39	0.62	1988	7027	4534	21.39	2200	14	0.4	-do-	1899	0
13 A	Malangaon	780	11.32	15.02	0.00	1972	2674	1587	4.30	2675	15	0.5	-do-	647	0
12	Panzara	780	35.63	72.66*	0.71	1976	7328	6868	35.63	6500	25	0.8	Maize, Bajra, Wheat	1231	0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
13 A	Suki	774	39.85	45.47	0.00	1985	8647	5128	39.85	1467	8	0.9	Groundnut, Pulses, Sorghum, Cotton	1848	363
<b>CADA Nagpui</b>															
7	Chandrabhaga	1016	8.262	8.25	0.02	1974-75	3181	2604	3.87	106	15	2.1	Orange, Wheat, Gram, Vegetable, Cotton	3181	0
7	Wenna	1100	21.66	9.49	11.55	1968	2000	1214	10.40	279	10	1.33	Wheat, Cotton, Orange, Gram, Vegetables	2000	0
<b>CADA Nashil</b>															
1	Adhala	500	27.6	38.74	0.00	1977	6427	3914	27.60	3646	16	3 to 4	Sorghum, Wheat, Grass, Bajri, Groundnut, Maize	1512	0
1	Alandi	614	27.57	21.00	5.67	1985	7408	6296	27.46	2000	18	3	Vegetables, Grapes, Sorghum, Sugarcane, Wheat, Gram	1836	834
1	Bhojapur	393	10.7	8.15	2.55	1973	4580	4500	10.21	4000	24	1.7	Bajri, Wheat, Sorghum, Gram	500	500
1	Mand Ohol	600	8.78	13.16	0.00	1983	2833	2286	8.78	2830	15	3 to 4	Sorghum, Wheat, Grass, Maize, Sunflower, Sugarcane	2427	0
<b>CIPC Chandrapur</b>															
7	Amalnalla	1218	21.2	19.52	0.00	1981	4710	2962	5.20	1280	22	1.5 to 2	Wheat, Cotton, Gram	3771	0
7	Dongargaon	1100	4.44	3.17	0.00	1974	972	631	0.96	328	9	1.5 to 2	-do-	608	608
7	Labhansarad	1103	7.35	5.87	0.00	1987	2024	2024	4.80	725	11	1.5 to 2	Wheat, Cotton,	2024	0
7	Panchdhara	1103	8.75	8.43	0.00	1976	2262	1822	3.81	1375	14	1.5 to 2	Cotton, Wheat	2475	867
7	Poithara	1100	34.72	34.72	0.00	1984	10910	8948	19.39	1821	33	1.5 to 2	-do-	3778	0
<b>NIC Nanded</b>															
6	Dongargaon	1150	8.36	11.55	0.00	1983	1008	830	2.83	561	5	1.8	-do-	400	0
6	Nagzari	1150	6.56	6.18	2.92	1983	1260	960	3.51	269	6	4.68	-do-	665	0
<b>PIC Pune</b>															
18	Mhaswad	533	46.21	46.21	0	1881	5804	4049	23.56	2500	11	1	Sorghum, Bajri, Groundnut	529	0
18	Ranand	538	6.42	1.83	0	1953	3886	1093	6.42	1100	6		Kadwal, Wheat, Sorghum	3886	0
18	Tisangi	508	24.46	24.46	0	1965	5068	4049	24.46	2697	0	1	Sorghum, Bajri,	598	0
17	Vadiwale	2845	30.39	22.18	0	1990	5564	5000	29.39	4415	26	0.15 to 1	Paddy, Wheat	587	0
<b>YIC Yavatmal</b>															
7	Nawargaon	1067	12.47	13.28	2.71	1999	2574	2056	2.90	2680	15	0.56	-do-	2574	0
<b>Surplus</b>															
<b>CADA Nagpui</b>															
8	Bageda	1146	4.535	4.11	0.00	1974	1887	1798	2.57	1296	10	0.85	Paddy	1887	0
8	Betkar Bothali	1186	3.666	3.67	0.00	1989	1266	1315	3.49	672	4	0.75	-do-	1266	0

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
8	Bodalkasa	1281	19.18	16.45	2.73	1917	14865	4047	10.74	6283	36	0.21	-do-	9839	0
8	Chandpur	1200	28.87	28.87	0.00	1916	10117	6271	8.13	8274	40	0.9	-do-	10117	0
8	Chorkhamara	1267	22.8	20.80	0.00	1917	13246	4047	4.44	1210	25	0.35	-do-	13246	0
8	Chulband	1384	22.24	16.82	0.00	1976	3378	3167	7.21	2929	21	1.1	-do-	3378	0
8	Kanholibara	1004	19.82	22.03	4.73	1976	4815	3371	14.27	1217	22	3	HW Groundnut, Cotton, Soybean, Wheat, Gram, Vegetables	6025	0
8	Kesamala	979	3.93	4.28	0.00	1976	937	780	0.98	126	7	1.6	-do-	937	0
8	Khairbanda	870	15.953	12.22	0.00	1915	11271	6109	4.48	6400	31		-do-	112267	0
8	Khekranala	963	23.81	29.54	0.00	1987	3810	2610	13.15	1829	14	1.5	Cotton, Wheat, Gram, Orange, Sugarcane, HW Groundnut, Soybean, Vegetables.	3144	0
8	Kolar	978	31.32	41.23	1.21	1984	8088	5940	9.16	2829	43	2.1	-do-	8088	0
8	Makardhokda	963	26.91	27.37	1.45	1980-81	5835	5477	19.00	2625	29	1.33	Paddy, Cotton, Chillies, Wheat, Sorghum, Gram, Soybean, Vegetables	3512	0
8	Managad	1609	7.081	7.83	0.00	1970	3390	1700	3.36	1006	11	0.35	-do-	3390	0
8	Mordham	1016	4.95	4.91	0.05	No data	1423	1315	1.94	406	8	2.1	Orange, Wheat, Gram, Vegetables, Cotton	1423	0
8	Pandharabodi	1290	13.25	14.51	2.15	1974-75	1044	862	13.13	754	12	2.18	Paddy, Chillies, Wheat, Gram, Soybean, Sunflower.	1030	0
8	Rengpar	1138	3.338	5.86	0.00	1977	1305	870	3.56	1044	7	0.75	-do-	1305	0
8	Sangrampur	1281	3.868	8.87	0.46	1969	1536	1094	1.38	1409	7		-do-	1194	0
8	Soma	1255	5.733	5.73	0.00	1972	1553	933	3.56	943	8	0.75	-do-	1553	0
8	Umari	1064	5.14	5.85	0.00	1971-72	1802	1195	2.85	749	8	2	Wheat, Cotton, Orange, Gram, Vegetables, Groundnut	1902	0
<b>CIPC Chandrapur</b>															
8	Chandai	1205	10.69	9.28	0.00	1983	2565	2056	10.69	1309	14	1.5 to 2	-do-	2565	0
8	Chargaon	1285	19.86	11.98	0.00	1983	1946	1500	18.43	1149	12	1.5 to 2	Paddy, Wheat	884	0
<b>Abundani</b>															
<b>CIPC Chandrapur</b>															
9	Ghorazari	1285	38	35.00	0.00	1923	12868	3846	33.22	7181	65	1.5 to 2	Paddy	4961	0
9	Naleshwar	1147	8.18	4.29	0.00	1922	5035	1888	8.18	3097	23	1.5 to 2	-do-	2329	0
<b>KIC Ratnagiri</b>															



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
23	Natuwadi	3632	27.230	27.23	0.00	1984	2139	2050	27.23	3629	18	0.02 to 0.05	Paddy, Groundnut, Pulses, Mango	2050	
	<b>SIC Sangli</b>														
15	Chikotra	1074	43.08	43.05	0.00	2001	6833	5630	31.17	1326	27	1 to 2	Sugercane, Paddy, Wheat, Vegetables	6833	0
15	Chitri	1524	52.35	64.45	0.00	2001-02	9160	5850	52.36	2590	54	0.55	-do-	9160	0
15	Jangamhatti	2190	33.21	26.37	6.84	1996-97	4450	3700	26.15	8000	10	0.1	Sugercane, Maize, Chilly, Wheat, Potato, GrouNo Datanut	4457	0
15	Kadavi	3418	70.67	70.56	0.00	2001	9908	9219	70.67	2211	52	0.8	-do-	9908	0
15	Kasari	4560	77.96	61.57	0.00	1989	9995	5458	76.90	3197	61	1 to 1.5	Sugercane, Paddy, Wheat	9995	0
15	Kumbhi	4985	76.5	74.81	1.68	2001	9170	8711	54.86	1773	51	0.10 to 1	Sugercane, Wheat, Groundnut, Sunflower	9170	0
15	Patgaon	3486	104.77	78.58	26.19	1996	10000	8100	79.86	3525	44	1 to 2	Sugercane, Paddy, Wheat	10000	0
	<b>TIC Thane</b>														
21	Wandri	2540	35.938	35.94	0.00	1984.85	3066	2044	35.94	1526	17	0.25	-do-	0	

Overview of Projects selected for Benchmarking (Minor Projects)													
Plan Group/SB No	Circle/Project	Avg. Annual Rainfall (mm)	Designed Live Storage (Mm <sup>3</sup> )	Designed Water use for Irrigation (Mm3)	Designed Water use for Non irrigation (Mm3)	Year of Commence ment of Irrigation	Culturable Command Area (ha)	Irrigable command area (ha)	Max.Live Storage observed during 2004-05	No. of villages in benefit zone	Avg. farm size (ha)	Main crops	Area covered under WUA (ha)
1	2	3	4	5	6	7	8	9	10	12	13	14	15
<b>Highly Deficit</b>													
<b>CADA Beed</b>													
19	Bagalwadi	685	1.33	1.65	0	1971	441	340	ND	3	1 to 3	Sorghum, Groundnut, Wheat Sunflower	0
19	Inchama	589	1.93	1.93	0	1971	615	555	ND	7	0.5 to 4	Sorghum, Groundnut, Sugarcane, Maize Sunflower	0
19	Kini	589	1.24	1.24	0	1967	385	380	0.00	3	0.5 to 4	Sorghum, Groundnut, Sugarcane, Maize Sunflower	0
19	Titraj	685	1.14	1.47	0	1985	367	275	ND	3	1 to 3	Sorghum, Groundnut, Wheat Sunflower	0
<b>Cada Solapur</b>													
19	Mangi	500	32.70	27.50	0	1966	4000	3117	2.01	21	0.5 to 4	Sorghum, Groundnut, Sugarcane, Maize, Sunflower	931
19	Pathari	500	11.62	10.63	0.99	1905	1012	647	0.30	7	0.5 to 4	Sorghum, Groundnut, Sugarcane, Wheat, Sunflower	352
<b>Deficit</b>													
<b>AIC Akola</b>													
3	Ancharwadi-1	737	2.34	2.66	0	1985	607	370	0.13	2	1 to 2	Wheat, Gram, Cotton	No Data
10	Jamwadi	1196	2.16	2.16	0	1978	580	406	0.81	4	1 to 2	Wheat, Gram, Cotton, Sorghum	No Data
10	Mozari	695	2.93	2.35	0	1977	675	475	0.00	2	1 to 2	Wheat, Gram, Cotton, Hy,Jawar.	928

1	2	3	4	5	6	7	8	9	10	12	13	14	15
10	Shekdari	911	4.56	4.88	0	1981	1975	1331	2.58	7	1.2	Cotton, Sorghum, Wheat, Gram, Orange.	1289
	<b>BIPC Buldhana</b>												
10	Adol	850	9.30	7.06	2.45	1991-92	1506	1585	0.00	10	3.0	-do-	1585
10	Brahmanwada	753	6.18	6.08	0.00	1995-96	1495	1196	2.63	4	3.0	Cotton, Chilly, Sunflower	1311
3	Kardi	766	4.89	5.52	0.00	1991-92	1197	958	1.36	8	1.5	Cotton, Chilly, Sunflower	1197
3	Masural	776	8.25	7.88	2.92	1990-91	841	734	0.68	5	1.0	Cotton, Chilly, Sunflower	854
3	Mohagavan	800	5.72	4.14	0.52	1998-99	1048	706	0.99	5	3.0	Cotton, Chilly, Sunflower	0
4	Sawakhed Bhoi	66	3.79	2.61	0	1988-99	589	445	1.35	7	3.0	Cotton, Chilly, Sunflower	445
4	Shivan kd.	793	4.67	2.58	0	1995-96	712	605	0.00	6	2.0	-do-	No Data
3	Vidrupa	590	3.41	0.00	0.00	1990-91	1020	840	1.05	6	1.5	Cotton, Chilly, Sunflower	0
10	Vishwamitri	772	10.75	13.91	1.25	1993-94	1882	1392	3.97	7	3.0	-do-	233
10	Vyaghra	747	7.14	7.86	1.35	1991-92	1993	1615	1.50	8	1.5	Cotton, Chilly, Sunflower	204
	<b>CADA Aurangabad</b>												
2	Tandulwadi	653	1.994	1.99	0.00	1972	566	474	ND	3	1.15	Wheat, Sorghum, Cotton, Gram Groundnut	No Data
	<b>CADA Beed</b>												
4	Bhutekarwadi	855	2.870	3.37	0	1969	1013	809	0.36	4	1.90	Sorghum, Chilli, Maize, Vegetables, Wheat, Cotton	809
4	Dhanori	770	1.389	1.41	0	1974	467	343	ND	1	1.10	Sugarcane	No Data
4	Hiwarsinga	675	1.270	1.27	0	1989	299	257	0.75	1	1.16	Sorghum, Bajri, Cotton, Sunflower, Groundnut	No Data
	<b>CADA Jalgaon</b>												
11	Bamrud	743	2.18	1.97	0	1975	579	461	0.48	1	0.8	-do-	No Data
11	Chavdi	482	4.38	4.38	0	1972	388	323	4.31	2	1 to 2	Wheat, Gram, Onion, Groundnut	323
11	Dudhkhedha	6350	3.366	3.37	0	1972	480	303	3.37	4	0.4	Wheat, Cotton, Gram	No Data
11	Galan	743	1.87	2.01	0	1968	425	340	1.87	1	0.75	Cotton, Groundnut	No Data
11	Hatgaon-1	743	1.4	1.52	0	1974-75	441	267	1.06	1	1.5	Cotton, Vegetables	No Data

1	2	3	4	5	6	7	8	9	10	12	13	14	15
11	Kunzar-2	743	1.01	1.21	0	1991-92	223	178	0.00	1	1.5	-do-	No Data
11	Waghala-1	743	1.21	1.21	0	1976-77	313	223	0.78	1	1.5	-do-	No Data
11	Wakdi	743	0.98	0.93	0	1975	228	183	0.71	1	0.8	-do-	No Data
	<b>CADA Nashik</b>												
4	Kuttarwadi	618	1.46	2.12	0	1993	370	297	ND	2	2 to 3	Sorghum, Wheat, Grass, Bajri, Groundnut, Maize,	No Data
	<b>NIC Nanded</b>												
4	B.Hipperga	850	2.05	2.93	0	1973	481	481	1.42	3	2.09	-do-	No Data
4	Daryapur	875	1.02	1.57	0	1973	230	222	0.41	3	1.35	-do-	230
2	Koshtewadi	850	0.77	1.05	0	1966	190	190	0.77	1	1.05		No Data
4	Panshewadi	850	1.58	2.02	0	1975	320	263	1.58	3	1.16	-do-	No Data
3	Purjal	830	2.656	2.66	0	1975	631	558	0.00	4	0.9		No Data
4	Wasur	830	0.88	1.18	0	1971	213	171	0.39	2	3.32	Wheat, Gram, Sugarcane, Cotton, Groundnut, Sorghum	213
	<b>Normal</b>												
	<b>AIC Akola</b>												
6	Majara	924	3.23	2.50	0	1994	1425	1269	0.00	6	2.5 to 3	Cotton, Tur, Wheat	590
6	Singdoh	714	1.22	1.22	0	1976	246	185	0.03	3	1 to 2	Wheat, Gram, Cotton, Hy. Jawar.	209
	<b>CADA Beed</b>												
5	Amthana	755	1.16	1.47	0	1966	413	344	0.18	4	2.9	-do-	No Data
	<b>CADA Nagpur</b>												
7	Wahi	1267	2.02	2.88	0	1992	442	402	0.93	5	0.85	-do-	No Data
	<b>CADA Nashik</b>												
1	Mahirawani	600	2.52	2.52	0	1974	949	576	2.52	9		Wheat, Gram Kh.Vegetables	No Data
	<b>PIC Pune</b>												
17	Thoseghar	1158	1.84	1.84	0	1996	306	270	1.84	2	0.1	Paddy, Sorghum	No Data
18	Chincholi patil	500	2.17	2.17	0	1977	569	455	2.17	3	0.83	Sorghum, Grain, Sunflower, Maze	0
17	Rahu	364	9.79	9.79	0	1993	2300	1887	9.79	5	0.5 to 5	Sorghum, Bajri, Wheat, Maize, Vegetables, Paddy, Sugarcane	No Data
18	Tambe	500	4.85	4.85	0	1968	1354	750	4.85	7	0.4	Bajri, Sorghum, Kadwal	No Data
	<b>CIPC Chandrapur</b>												
7	Bhatala	1175	1.55	1.40	0	No Data	415	350	0.27	3	1.5 to 2	Paddy, Wheat	No Data
	<b>NIC Nanded</b>												

1	2	3	4	5	6	7	8	9	10	12	13	14	15
6	Hirdi	82	1.34	1.34	0	1983	353	283	0.96	2	0.9	-do-	No Data
6	Nichpur	1150	2.2	2.26	0.32	1973	525	385	0.96	2	4.77	Wheat, Gram, Sugarcane, Cotton, Groundnut, Sorghum	No Data
6	Pimparala	750	2.43	3.39	0	1968	749	672	0.02	5	2.2	-do-	749
6	Pota	650	1.67	2.13	0	1972	718	432	0.17	4	3.43	-do-	No Data
6	Sawana	804	2.154	1.65	0.51	1979	431	410	1.74	3	1	-do-	No Data
<b>Surplus</b>													
<b>CADA Nagpur</b>													
8	Bhadbhadya	1284	2.85	2.85	0.19	1975	800	674	ND	3	1.11	Paddy	No Data
8	Urkudapar	1214	4.75	4.75	0	1980	1265	1012	2.28	6	2	Paddy, Chilly, Wheat, Gram	No Data
8	Wani	1190	2.021	1.98	0	1983	526	405	1.12	5	5	-do-	No Data
<b>Abundant</b>													
<b>GIPC Chandrapur</b>													
9	Ashti	1100	1.64	1.36	0	1965	455	364	1.61	4	1.5 to 2	Wheat, Cotton, Gram	No Data
9	Lagam	1283	1.16	3.41	0	No Data	344	315	3.41	4	1.5 to 2	Paddy,	No Data
<b>KIC Ratnagiri</b>													
23	Shirwal	3800	3.750	2.35	0	1979	421	200	3.75	2	0.15 to 0.05	Coconut, Arecanut, Pepper, Spices, Paddy	200
<b>NKIPC Thane</b>													
21	Dhasai	2200	4.478	4.20	0	1984-85	457	340	4.47	6	0.5	Paddy, Vegetables & fruits	No Data
22	Panchanadi	3320	1.481	1.46	0	1984-85	114	91	1.46	3	0.2	Beetlenut, Coconut, Paddy	No Data
9	Atpadi	300	7.95	6.74	1.21	1967-68	1619	1120	7.95	5	2	Cotton, Sorghum	755
15	Benikre	1400	1.784	1.78	0	1990	358	286	ND	1	1.5 to 2	Sorghum, Groundnut, Wheat	No Data
<b>TIC Thane</b>													
21	Bhoj	2472	1.620	1.62	0	1974	216	135	1.56	3	0.35	-do-	No Data
22	Kalote Mokashi	3623	4.190	4.19	0	1976-77	126	105	4.19	4	0.20	Paddy	105
21	Khandpe	2377	2.000	2.00	0	1985	202	120	1.98	2	0.40	-do-	120
22	Kondgaon	3872	3.641	3.64	0	1979-80	212	188	3.64	5	NA	-do-	178
21	Mohknurd	3070	3.590	4.74	0	1975	213	173	4.74	5	0.35	-do-	No Data
22	Pabhre	3429	1.787	1.79	0	1978-79	174	133	1.79	3	0.20	-do-	133

## Appendix-VI

### Quantitative Performance Evaluation

An attempt has been made this year as a part of internal benchmarking to evaluate the performance of circles quantitatively.

The method adopted for working evaluation is as follows.

- The analysis is done for major projects only.
- Four main indicators have been chosen for the exercise.

The indicators selected are;

Sr. No.	Indicator	Objective
1	Annual Irrigation Water Supply per Unit Irrigated Area	To verify water use efficiency.
2	Potential Created & Utilised	To verify the extent of utilisation of created irrigation potential.
3	Output per unit Area	To check productivity per unit of water use in the command.
4	Cost Recovery Ratio	To check whether the project is financially sustainable or not.

- The evaluation is based on ratio of values for 2004-05 and values for past (1999-00 to 2003-04)
- The overall evaluation is average of ratios for four indicators.
- The figure arrived at indicates the overall index of the respective circle for 2004-05.

For example, the index for CADA Solapur (highly deficit) is 1.03, and for UWPC Amravati (deficit), the index is 0.84.

- Increase in value of overall index in subsequent years will indicate improvement in the performance.
- The value for cost recovery ratio is restricted to 1.00 in case it exceeds 1.00
- As the quantitative performance is comparison of self performance, inter-se comparison of other circles is not expected.

**Quantitative Performance Evaluation of a Circle  
Major Projects**

**Highly Deficit Plangroup  
CADA Solapur**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Index
I Annual Irrigation Water Supply per Unit Irrigated Area	10919	9572	9572/10919	0.88	<b>1.03</b>
II Potential Created & Utilised	0.49	0.63	0.63/0.49	1.29	
III Output per unit Area	45432	43837	43837/45432	0.96	
V Cost Recovery Ratio	1.00	1.00	1.00/1.00	1.00	

**Deficit Plangroup  
UWPC Amravati**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	7064	3759	3759/7064	0.53	<b>0.84</b>
II Potential Created & Utilised	0.51	0.42	0.42/0.51	0.82	
III Output per unit Area	20029	14286	14286/20029	0.71	
V Cost Recovery Ratio	0.74	0.97	0.97/0.74	1.31	

**CADA Nashik**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	4863	3960	3960/4863	0.81	<b>0.81</b>
II Potential Created & Utilised	0.63	0.43	0.43/0.63	0.68	
III Output per unit Area	58043	43133	43133/58043	0.74	
V Cost Recovery Ratio	1	1	3.07/3.07	1.00	

**NIC Nanded**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	8156	4250	4250/8156	0.52	<b>0.59</b>
II Potential Created & Utilised	0.82	0.83	0.83/0.82	1.01	
III Output per unit Area	33023	15545	15545/33023	0.47	
V Cost Recovery Ratio	1	0.34	0.34/1.49	0.34	

**CADA Jalgaon**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	13137	5146	5146/13137	0.39	<b>1.46</b>
II Potential Created & Utilised	0.23	0.89	0.89/0.23	3.87	
III Output per unit Area	22616	13334	13334/22616	0.59	
V Cost Recovery Ratio	1	0.99	0.99/1.02	0.99	

**AIC Akola**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	7528	9622	7528/9622	0.78	<b>0.73</b>
II Potential Created & Utilised	0.71	0.63	0.63/0.71	0.89	
III Output per unit Area	27290	17113	17113/27290	0.63	
V Cost Recovery Ratio	1	0.62	0.62/1.61	0.62	

**CADA Beed**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	5324	11975	5324/11975	0.44	<b>0.34</b>
II Potential Created & Utilised	0.55	0.18	0.18/0.55	0.33	
III Output per unit Area	53030	8580	8580/53030	0.16	
V Cost Recovery Ratio	1	0.44	0.44/1.81	0.44	

**CADA Aurangabad**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation

I Annual Irrigation Water Supply per Unit Irrigated Area	7013	16899	7013/16899	0.41	<b>1.17</b>
II Potential Created & Utilised	0.3	0.68	0.68/0.3	2.27	
III Output per unit Area	23504	23504	23504/23504	1.00	
V Cost Recovery Ratio	1	1	1.88/1.72	1.00	

#### Normal Plangroup

##### AIC Akola

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	8529	0.00	0.00/8529	0.00	<b>0.63</b>
II Potential Created & Utilised	0.63	0.00	0.00/0.63	0.00	
III Output per unit Area	25524	0.00	0.00/25524	0.00	
V Cost Recovery Ratio	1.00	0.63	0.63/1.00	0.63	

##### NIC Nanded

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	9731	3927	3927/9731	0.40	<b>0.85</b>
II Potential Created & Utilised	0.51	1.00	1.00/0.51	1.96	
III Output per unit Area	39808	26542	26542/39808	0.67	
V Cost Recovery Ratio	0.47	0.18	0.18/0.47	0.38	

##### CADA Pune

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	8543	5158	5158/8523	0.60	<b>0.67</b>
II Potential Created & Utilised	0.92	0.91	0.91/0.92	0.99	
III Output per unit Area	50853	23941	23941/50853	0.47	
V Cost Recovery Ratio	1.00	0.62	0.62/1.00	0.62	

##### CIPC Chandrapur

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	10979	7422	7422/10979	0.68	<b>0.63</b>
II Potential Created & Utilised	0.49	0.45	0.45/0.49	0.92	
III Output per unit Area	28752	18421	18421/28752	0.64	
V Cost Recovery Ratio	0.43	0.12	0.12/0.43	0.28	

##### CADA Jalgaon

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	7201	8315	7201/8315	0.87	<b>1.4</b>
II Potential Created & Utilised	0.25	0.81	0.81/0.25	3.24	
III Output per unit Area	148519	72332	72332/148519	0.49	
V Cost Recovery Ratio	1.00	1.00	1.00/1.00	1.00	

##### PIC Pune

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	10726	8286	10726/8286	1.29	<b>0.98</b>
II Potential Created & Utilised	1.00	1.00	1.00/1.00	1.00	
III Output per unit Area	31589	20062	20062/31589	0.64	
V Cost Recovery Ratio	1.00	1.00	1.00/1.00	1.00	

##### CADA Nashik

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	10553	12033	10553/12033	0.88	<b>0.67</b>
II Potential Created & Utilised	1.00	0.61	0.61/1.00	0.61	
III Output per unit Area	126149	26755	26755/126149	0.21	
V Cost Recovery Ratio	1.00	1.00	1.00/1.00	1.00	



**NIC Nagpur**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	13302	12560	13302/12560	1.06	<b>1.01</b>
II Potential Created & Utilised	0.88	0.88	0.88/0.88	1.00	
III Output per unit Area	11445	11445	11445/11445	1.00	
V Cost Recovery Ratio	1.00	1.00	1.00/1.00	1.00	

**UWPC Amravati**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	17432	17268	17432/17268	1.01	<b>0.9</b>
II Potential Created & Utilised	0.21	0.25	0.25/0.21	1.19	
III Output per unit Area	23149	18719	18719/23149	0.81	
V Cost Recovery Ratio	1.00	0.60	0.60/1.00	0.60	

**Surplus Plangroup****CADA Nagpur**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	8232	8833	8232/8833	0.93	<b>0.89</b>
II Potential Created & Utilised	1.00	0.77	0.77/1.00	0.77	
III Output per unit Area	25463	22058	22058/25463	0.87	
V Cost Recovery Ratio	1.00	1.00	1.00/1.00	1.00	

**Abundant Plangroup****CIPC Chandrapur**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	8092	3870		2.09	<b>1.19</b>
II Potential Created & Utilised	1	1		1.00	
III Output per unit Area	29413	24261		0.82	
V Cost Recovery Ratio	0.92	0.77		0.84	

**CADA Pune**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	7295	6155		1.19	<b>0.96</b>
II Potential Created & Utilised	0.9	0.9		1.00	
III Output per unit Area	30159	20076		0.67	
V Cost Recovery Ratio	1	1		1.00	

**SIC Sangli**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	8720	10120		0.86	<b>0.77</b>
II Potential Created & Utilised	1	0.4		0.40	
III Output per unit Area	63025	51680		0.82	
V Cost Recovery Ratio	1	1		1.00	

**TIC THANE**

Indicator	Best of past	Value for 2004-05	Formula	Ratio	Overall Evaluation
I Annual Irrigation Water Supply per Unit Irrigated Area	34996	24784		1.41	<b>0.96</b>
II Potential Created & Utilised	0.9	0.45		0.50	
III Output per unit Area	47180	44567		0.94	
V Cost Recovery Ratio	1	1		1.00	

Note: The cost recovery ratio is restricted to 1 even for higher values.

## Appendix-VII

### Physiography & Agro- Climatic zones of Maharashtra

#### Physiography

The State is divided into five major regions physiographically:

i) Konkan strip on western side (ii) Sahyadri ranges (iii) Plateau on eastern side (iv) Hilly ranges of Satpuda and adjacent area on north and (v) Hilly and forest region of north-south Wainganga basin.

1) Konkan Strip

The narrow strip of land extending from Damanganga basin in north to the border of Goa State in south is the Konkan. It has Sahyadri ranges on east and Arabian Sea on west. The Konkan strip is about 53 to 60 km wide and 500 km long along north-south. The widest stretch is about 100 km. Width decreases as one proceeds towards south. The region becomes hilly and altitude increases from the depressed coastline towards east.

2) Sahyadri Ranges

These continuous mountain ranges extend almost parallel to the western coast line. It is known as *Western Ghat*. The average height of Sahyadri in Maharashtra is 900 m. It is more in the north and diminishes towards south.

3) Eastern Plateau Region (Deccan Plateau)

The height of this plateau goes on diminishing from 600 m on western side to 300 m in the Wainganga basin on east. This region is formed from lava of igneous rocks.

All the districts of Khandesh<sup>1</sup>, Marathwada<sup>2</sup>, Western Maharashtra and the western districts of Vidarbha<sup>3</sup> fall in this region.

4) Satpuda Ranges and Tapi – Purna basin on North

Satpuda hill ranges lie on the northern boundary of the State. This region is spread over in the districts of Amravati, Akola, Jalgaon and Dhule.

5) Eastern Region Consisting of Wainganga basin

Eastern Region comprises of eastern side of the State and flat paddy field region lies along both the banks of the river at an elevation of about 300 m. On the eastern side of this flat region along the Maharashtra - Chhattisgarh boundary are the hills of different geological formations other than the Deccan Trap. Many eastern tributaries of Wainganga originate from this hill range. The height of this hilly plateau is around 800 m.

#### River Basins

The State is mainly covered by the basins of Krishna, Godavari and Tapi except the west-flowing rivers of Konkan strip. A small portion on north comes under Narmada basin. There are in all 380 rivers in the State and their total length is 19269 km. Most of the land is undulating and hilly. Comparatively, continuously hilly plateau lands are very few. Because of this, flow canal systems in Maharashtra are very expensive, though there are large number of suitable sites for building water storage reservoirs.

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<sup>1</sup> Khandesh includes Dhule, Nandurbar & Jalgaon districts

<sup>2</sup> Marathwada includes Aurangabad, Jalna, Parbhani, Nanded, Osmanabad, Latur, Hingoli & Beed districts

<sup>3</sup> Vidarbha includes Akola, Washim, Amravati, Yavatmal, Wardha, Nagpur, Bhandara, Gondia, Chandrapur & Gadchiroli districts.

Number of rivers originate from Sahyadri at about 500 to 700 m elevation and flow westward to Arabian Sea through the Konkan strip. Damanganga, Surya, Vaitarna, Ulhas, Karla, Kundalika, Kal, Savitri, Vashishthi, Shastri, Gad, Karli, Tillari and Terekhol are the prominent rivers. These rivers are of shorter length holding fair amount of water during monsoon but run totally dry during summer. The natural calamities such as land erosion, salt water intrusion, land subsistence etc. are often inflicted upon Konkan.

Tapi and Narmada are the two west-flowing rivers coming from Madhya Pradesh and flowing down to Gujarat State through Maharashtra. Narmada forms 54 km long common boundary of the State along northern border. Total length of Tapi in Maharashtra is 208 km. These rivers and tributaries have rendered the land of Khandesh<sup>4</sup> fertile.

Wainganga flows in north-south direction. The length of Wainganga in Maharashtra is 476 km. Godavari is the principal east-flowing and longest river in Maharashtra (968 km).

South-east flowing Bhima and mainly north-south flowing Krishna are the major rivers of South Maharashtra. The length of Bhima in Maharashtra is 451 km. It joins Krishna on the Karnataka-Andhra Pradesh boundary near Raichur.

Krishna rises near Mahabaleshwar. Krishna is 282 km long in the State.

**Basin-wise water availability – (Maharashtra – India)**

Sr. No	Basin	Geographical Area (Mha)	Culturable Area (Mha)	Average Annual Availability (BCM)	75% Dependable Yield (BCM)	Permissible Use As Per Tribunal Award (BCM)
1	Godavari	15.430	11.256	50.880	37.300	34.185
2	Tapi	5.120	3.731	9.118	6.977	5.415
3	Narmada	0.160	0.064	0.580	0.315	0.308
4	Krishna	7.010	5.627	34.032	28.371	16.818
5	West flowing Rivers	3.160	1.864	69.210	58.599	69.210
	Total:	30.88	22.542	163.820	131.562	125.936

**Sub-basinwise planning**

As per the recommendations laid down in the National Water Policy – 2002 and Maharashtra Water and Irrigation Commission’s Report, the State Water Policy has been adopted by GOM in 2003.

The objectives of the Maharashtra State Water Policy are to ensure the sustainable development and optimal use and management of the State’s water resources, to provide the greatest economic and social benefit for the people of the State of Maharashtra and to maintain important ecological values within rivers and adjoining lands.

The Maharashtra State Water Policy mentions that -

‘To adopt an integrated and multi-sectoral approach to the water resources planning, development and management on a sustainable basis taking river basin/sub basin as a unit.’

<sup>4</sup> Khandesh includes Dhule, Nandurbar and Jalgaon districts.

The water resources of the State shall be planned, developed, managed with a river basin/ sub basin as a unit, adopting multisectoral approach and treating surface and sub-surface water with unitary approach.'

The geographical area of the State is 308 lakh ha and cultivable area is 225 lakh ha. This geographical area is divided mainly into five major river basins of Godavari, Krishna, Tapi, Narmada and basin groups in Konkan. There are 22 narrow basins of west flowing rivers in Konkan.

The Maharashtra Water and Irrigation Commisison has proposed delineation of five river basins basically into 25 distinct sub basins for planning of water resources development in the State. The categorisation of sub basins proposed is solely on the basis of natural availability of water. The basic characteristics of sub basins are dictated by the hydrological regime, which in turn, is a function of climate, rainfall distribution and the draining area.

The sub basins are as follows:

Sr. No.	River Basin	Names of Sub basins	Abbreviated name	Categorisation for planning on the basis of availability of natural water
I	Godavari	1) Upper Godavari (Upto Paithan Dam)	Upper Godavari	Normal
		2) Lower Godavari (D/S of Paithan Dam)	Lower Godavari	Deficit
		3) Purna (including Dudhana)	Purna Dudhana	Deficit
		4) Manjra	Manjra	Deficit
		5) Godavari-Sudha-Swarna	Remaining Godavari	Normal
		6) Painganga	Painganga	Normal
		7) Wardha	Wardha	Normal
		8) Middle Wainganga	Middle Wainganga	Surplus
		9) Lower Wainganga	Lower Wainganga	Abundant
II	Tapi	10) Purna (Tapi)	Purna Tapi	Deficit
		11) Girna	Girna	Deficit
		12) Panzara	Panzara	Normal
		13) Middle Tapi	Middle Tapi	Deficit
III	Narmada	14) Narmada	Narmada	Surplus
IV	Krishna	15) Upper Krishna (West)	Upper Krishna (W)	Abundant
		16) Upper Krishna (East)	Upper Krishna (E)	Highly Deficit
		17) Upper Bhima (Upto Ujjani)	Upper Bhima	Normal
		18) Remaining Bhima	Remaining Bhima	Normal
		19) Sina-Bori-Benetura	Sina-Bori-Benetura	Highly Deficit
V	West Flowing Rivers in	20) Damanganga-Par	Damanganga-Par	Abundant
		21) North Konkan	North Konkan	Abundant

Sr. No.	River Basin	Names of Sub basins	Abbreviated name	Categorisation for planning on the basis of availability of natural water
	Konkan	22) Middle Konkan	Middle Konkan	Abundant
		23) Vashisthi	Vashisthi	Abundant
		24) South Konkan	South Konkan	Abundant
		25) Terekhol – Tillari	Terekhol – Tillari	Abundant

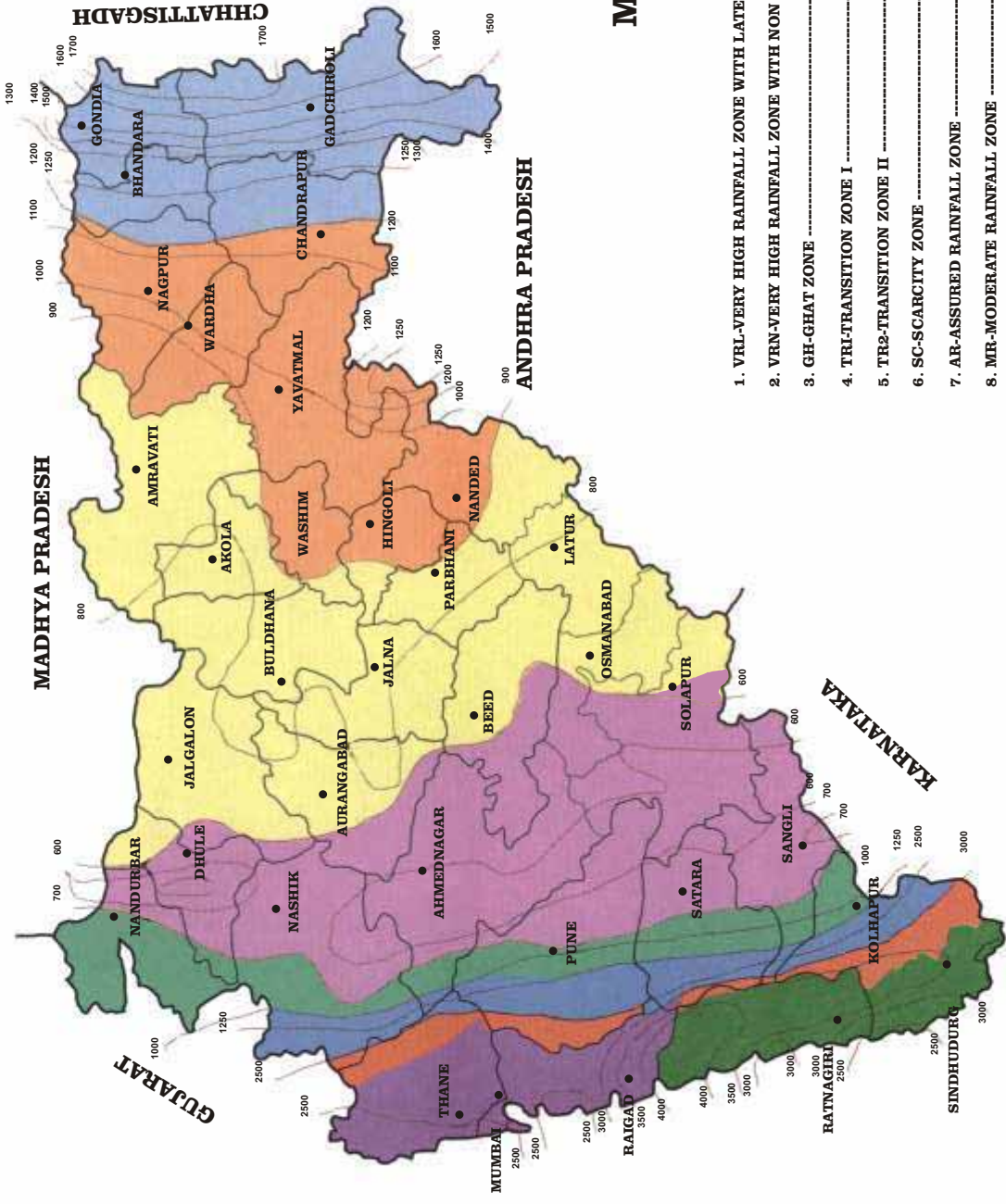
Categorisation of sub basins for planning, on basis of naturally available quantum of water, is given below :

Sr. No.	Plan Group	Per ha availability (m <sup>3</sup> )	Percent of cultivable area of State
i)	Highly Deficit Area	Below 1500	13
ii)	Deficit area	1501-3000	32
iii)	Normal area	3001-8000	34
iv)	Surplus area	8001-12000	06
v)	Abundant area	Above 12000	15

A graph showing basinwise availability of water is appended herewith.

The performance of a circle (herein called service provider) very much depends upon the availability of water, which in turn is governed by the type of sub-basin in which the project is located. Some circles are having projects located in more than one category of plan group of sub-basins. Therefore, these circles will appear more than once, in graphical representation of indicators.

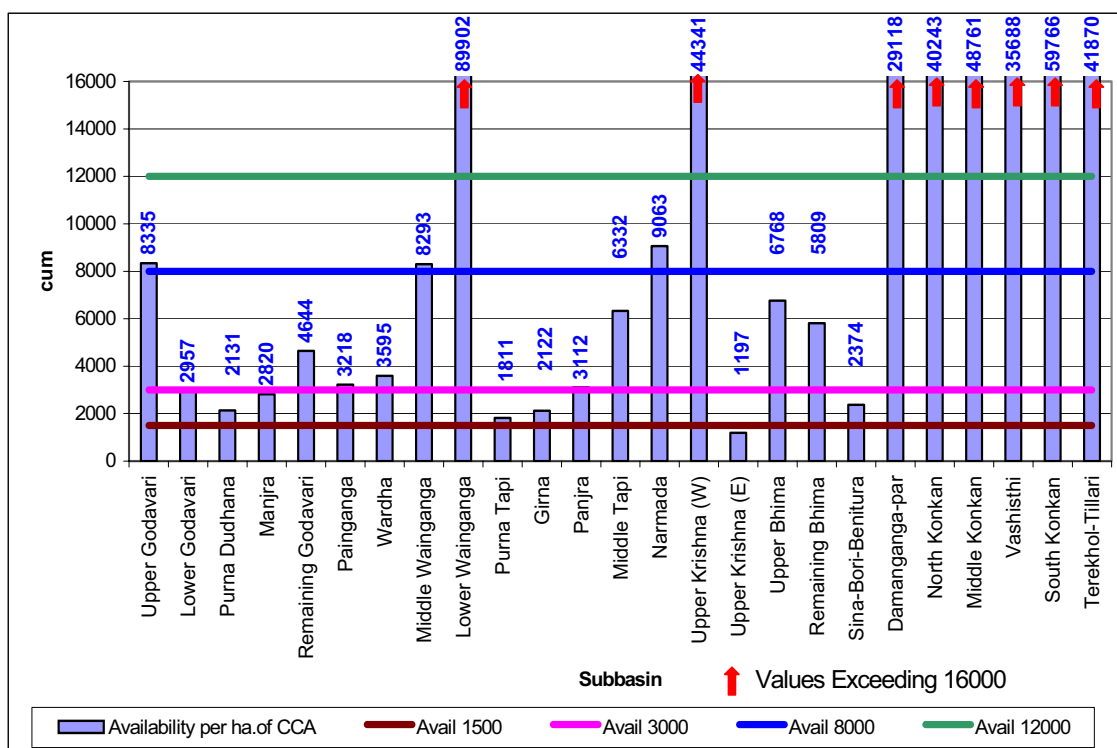
# MAP SHOWING AGRO-CLIMATIC ZONES



## MAHARASHTRA STATE

1. VRL-VERY HIGH RAINFALL ZONE WITH LATERITIC SOILS
2. VRN-VERY HIGH RAINFALL ZONE WITH NON LATERITIC SOILS
3. GH-GHAT ZONE
4. TR1-TRANSITION ZONE I
5. TR2-TRANSITION ZONE II
6. SC-SCARCITY ZONE
7. AR-ASSURED RAINFALL ZONE
8. MR-MODERATE RAINFALL ZONE
9. HRM-HIGH RAINFALL ZONE WITH SOILS FROM MIXED PARENT MATERIAL

## Water Availability per ha of Culturable Area



### Climate

Maharashtra is having mostly a seasonal climate. Four distinct seasons are noticeable in a year viz. (1) Monsoon: The rains start with the south - west winds. Mainly it rains during the four months from June to September, but it often extends up to October. (2) Post-monsoon season: October to mid December is a fair weather season with meagre rains. These are the initial months of the post-monsoon, *Rabi* crops and the condition of later depends upon the weather during these months. (3) Winter: It is generally a period of two or two-and-a-half months, from mid-December until end of February. Most of the *Rabi* crops are harvested during these months. (4) Summer: It lasts for at least three months - March to May.

There is considerable variation in weather and rainfall among the five different geographical regions of Maharashtra.

1 The coastal districts of Konkan experience heavy rains but mild winter. The weather, however, is mostly humid throughout the year.

The maximum and minimum temperatures here range between 27°C and 40°C and 14°C to 27°C respectively. The relative humidity is 81% to 95% during June to August while 30% to 65% during January - February.

2 The western parts of Nashik, Pune, Satara and Kolhapur districts show a steep reduction in rainfall from the mountainous regions towards the East. The maximum temperature ranges between 26°C to 39°C and the minimum temperature between 8°C to 23°C. The relative humidity is 81% to 99 % in August and only 20% to 39% in March.

3 The eastern part of the above four districts together with Ahmednagar, Sangli, Solapur, Aurangabad, Jalna, Beed and Osmanabad districts fall under the rain

shadow of Sahyadri Mountains and therefore the beginning and end of the rainy season is quite uncertain in these parts. The rainfall is also meagre. The climate is extreme. The summer temperature is high (maximum temperature 36<sup>0</sup>C to 41<sup>0</sup>C) but winter temperature is low (minimum temperature. 10<sup>0</sup>C to 16<sup>0</sup>C). The relative humidity in August is between 82% to 84% but only 19% to 26% in April. The rainfall increases as we go towards east viz. Parbhani, Nanded and Yavatmal. Many a times the eastern winds during the end of monsoon cause precipitation here.

4 Likewise the Tapi basin, the southern parts of Satpuda ranges and Dhule-Jalgaon districts towards west is low rainfall part like that of rain shadow region. But towards east Buldhana, Akola and Amravati districts experience a heavy rainfall. Summer temperature in this region is quite high (39<sup>0</sup>C to 43<sup>0</sup>C) and minimum winter temperature is found to be 12<sup>0</sup>C to 15<sup>0</sup>C. Relative humidity between May to August is 82% to 87% whereas in March-April it is 12% to 31%.

5 The Wainganga basin on east of Maharashtra and the hilly region still farther east is, on the whole, a zone having good rainfall, but as it is some what low lying area, the climate is even more extreme. The summer temperature is very high (39<sup>0</sup>C to 45<sup>0</sup>C) while it is cooler in winter as compared to other regions (12<sup>0</sup>C to 14<sup>0</sup>C).

### **Rainfall**

Maharashtra gets rain both from the south-west and the north-east monsoon winds. The proportion of the rainfall derived from the north-east monsoon increases towards east.

The average rainfall of the State is approximately 1360 mm. Nearly 88% of the total average rainfall occurs between June to September, while nearly 8% occurs between October to December and 4% after December. There is a considerable variation in the reliability of the rains in different parts of the State.

The steep decline in the rainfall to east of Sahyadri is strikingly noticeable. In the 30 to 50 km wide belt the average rainfall is observed to be less than 650 mm (as low as only 500 mm at some places). Thereafter, the rainfall increases steadily towards east and the average rainfall in the easternmost districts is observed to be 1400 mm.

The pre-monsoon rain during March to May is maximum in Western Maharashtra (5%) while in Marathwada it is 4%, in Vidarbha it is 3% and the minimum is in Konkan (1%).

The number of average annual rainy days is maximum 95 in Konkan, 55 in Vidarbha, 51 in Western Maharashtra and the minimum 46 in Marathwada.

Out of the total cultivable land in Maharashtra about 53% is under *Kharif* and about 30% is under *Rabi* crops. These mostly comprise of food grains and oilseeds. The rainfall during June to September affects both the *Kharif* and the *Rabi* crops. That is why the regularity of rainfall during this period is of importance. But it is seen that there is considerable fluctuation in the number of rainy days as well as the amount of rainfall from year to year. The fluctuation in rainfall is observed to be 25%, 40% and between 20% to 30% in Konkan, Central Maharashtra and Vidarbha respectively. Crop management on fields during this period thereby becomes quite difficult.



**Appendix-VIII**

**Abstract of Water Rates for Irrigation Domestic and Industrial Use for the year 2004-05**

	<b>Irrigation</b>	<b>Rate Rs./ha. (From 1-7-2004)</b>
<b>1</b>	<b>Flow Irrigation Crops</b>	
A	<b>Kharif</b> Seasonals & paddy (Agreement) Groundnut,Hy.Seeds etc.	238 476
B	<b>Rabi</b> Seasonals (except Wheat and Groundnut) Wheat Cotton,Groundnut,Paddy etc.	358 476 724
C	<b>Hot Weather</b> Seasonals	724
D	<b>Two Seasonals</b> Kharif and Rabi Rabbi & Hot Weather	357 605
E	<b>Perenial</b> Sugarcane,Banana	6298
<b>2</b>	<b>Lift Irrigation (water lifted from)</b>	Rs/ha
A	<b>Canal</b> Kharif Crops Rabi Crops Hot Weather Crops Perenial (Sugarcane, Banana) Other Perenial Crops	85 120 240 1810 1200
B	<b>Reservoir</b> Kharif Crops Rabi Crops Hot Weather Crops Perenial Other Perenial	40 60 120 910 605
C	<b>River</b> Kharif Crops Rabi Crops Hot Weather Crops Perenial Other Perenial	35 35 60 450 310
<b>3</b>	<b>Lift Irrigation (Volumetric basis )</b> From canal at minor head	Rs./Thousand m <sup>3</sup>
A	Kharif	47.60
B	Rabi	71.40
C	Hot Weather	144.80
D	If water users contributed for construction (Royalty) for all seasons	23.80
<b>1</b>	<b>Non Irrigation water rates</b> <b>Domestic Supply</b>	<b>Rs/10000 Litre.</b>
A	From reservoirs, canals and rivers downstream of dams	4.80
B	In case Capital Investment is done by user or contributed in proportion of water use	0.90
<b>2</b>	<b>Industrial Supply</b>	Rs/10000 Litre.
A	For Colddrinks,breverages,mineral water etc. From reservoirs, canals and rivers downstream of dams	360.00
B	In case Capital Investment is done by user or contributed in proportion of water use	48.00
<b>3</b>	<b>Other use</b>	Rs/10000 Litre.
A	From reservoirs, canals and rivers downstream of dams	108.00
B	In case Capital Investment is done by user or contributed in proportion of water use	14.50

## Chapter - 6 BENCHMARKING OF

### WATER AND LAND MANAGEMENT INSTITUTE (WALMI), AURANGABAD

#### 6.1.0 Introduction

WALMI Aurangabad (Maharashtra) is a premier training institute of its kind in India established on 1<sup>st</sup> October 1980 as an autonomous registered society under Water Resources Department, Government of Maharashtra for imparting the training in IWM.

#### 6.1.1 Objectives

The main objectives of the institute are:

- ◆ To provide in-service training of interdisciplinary nature to staff engaged in Irrigation Water Management and Land Development in Water Resources and Agriculture Departments
- ◆ Action and adaptive research pertaining to Irrigation Project Commands.
- ◆ Providing consultancy services, production of training materials (in print and electronic media), conducting seminars / workshops and organizing farmers' training programmes

Training is imparted by highly qualified, experienced and well-trained faculty members. WALMI has five faculties:

- ◆ Faculty of Engineering
- ◆ Faculty of Agriculture
- ◆ Faculty of Science (Computer Applications & Hydraulics)
- ◆ Faculty of Social Sciences
- ◆ Faculty of Integrated Watershed Development & Management

An optimal mix of core faculty and senior field officers on deputation to WALMI constituting the faculty, is one of the vital factors of this institute's strength and performance.

#### 6.2.0 Performance Indicators

The benchmarking of WALMI, is carried out by developing following performance indicators based on the activities of the institute. The performance is also compared with the requirement wherever possible.

- 1) Institutional performance
- 2) Qualitative performance
- 3) Financial indicators
- 4) Environmental aspects

#### 6.2.1 Institutional Performance

The institutional performance is assessed based on the following four indicators:

##### a) Strength of Teaching Staff

The strength of teaching staff is compared with the potential sanctioned positions and available positions over the period of last five years.

##### b) Annual Training Workload (Traineedays)

The annual training workload is compared with the planned training workload and achievement for last five years.

##### c) Annual Training Workload of Long Term Courses (Participants)

The number of participants actually participated in long term courses (25/21 week's duration) are compared with the potential strength of the long term courses for last five years.

**d) Annual Farmers' Training Workload (Participants)**

The number of participants actually participated in different farmer's training programmes are compared with the expected participants.

**6.2.2 Qualitative Performance**

The overall quality of institute's activities are assessed based on the following indicators:

- a) End of Course evaluation (i) L.T.C. (ii) S.T.C.
- b) Research activities
- c) Revisions & Development of publications
- d) Papers presented & published (state, national & international level)

**6.2.3 Financial Indicators**

This is assessed based on the actual expenses of the institute:

- a) Cost of training per traineeday
- b) Central Assistance for training programme

**6.2.4 Environmental Aspects**

Environmental indicators give information about involvement of participants in the training activities to acquire the knowledge, skills and attitudes for their jobs. It also indicates the conduciveness of environment in the institute.

- a) Referencing WALMI Library
- b) Visitors in WALMI

**6.3.0 Assessment Of Performance (Year 2004–05)**

**(i) Strength of teaching staff**

The strength of teaching staff shows a declining trend in last five years because of the retirement of core faculty. The shortfall is covered by increase in deputationists from GOM.

**(ii) Annual training workload (trainee days)**

Achievement in last five years is more than the planned training workload except for the year 2001-02 where actual training workload was little lower than the planned training workload because of no induction course was conducted though planned. The assessed annual training workload of the institute is about 45000 traineedays whereas the average planning of the last five years is about 28000. This is because of the faculty strength lower than the sanctioned strength. However, the average of achievement during last five years is 31475. The marginal increase in the achievement is mainly due to nominations received and actual attendance. The planning of the annual training workload mainly depends upon availability of the core faculty. Since the core faculty is declining, the planning also changed accordingly. Sometimes, changes in planning may occur due to some courses suggested by GOM even after preparation of the annual training calendar.

**(iii) Annual training workload of long term courses (participants)**

The annual workload is continuously increasing and achievements are higher than the planned. This is mainly due to the compilation of database of the management section officers and the mandatory requirement of training.

**(iv) Annual Farmers' training workload (participants)**

This indicator shows that the number of farmers participated in the courses are much higher than the expected participants. The workload is kept on changing because these courses are mostly sponsored by the local project authorities and therefore depending upon their responses, the courses are organised on the project sites. Due to this reason, the decline is observed in planning and achievements.

**(v) End of course evaluation**

In the method of end of course evaluation, the trainee officers are asked to give rating for various questions related to training. The average rating of end course evaluation for long term courses and short term courses (having period more than 4 days) during the year is around four, which indicates that overall quality of training is excellent. The decline in end of course evaluation from 4.39 to 4.08 is mainly due to infrastructural facilities. With the improvements in infrastructural facilities, improvement in this indicator is expected in future.

**(vi) Research activities**

There is a continuous improvement from the year 2003–04. Research studies are now accelerated so that experience gained during these studies will be shared through lectures, presentation of case studies in training courses. The performance of research activities is just 25 percent and there is no rise in the number of completed studies over last year. This is because these studies are of long term nature, an average tenure of these studies is about two years. However, from this year onwards, WALMI is trying to give more emphasis on the research activities.

**(vii) Revisions & Development of publications**

This can not be assessed exactly on yearly basis.

**(viii) Papers / Articles Presented & Published (State, National & International level)**

The numbers are in increasing order and is highest during the year 2003–04 in comparison to other years. The faculties are being motivated in this regard. The decline in papers and articles presented and published is mainly due to the decline in core faculty, as most of the contributors are from core faculty.

**(ix) Cost of training per trainee day**

This includes the expenditure on administration and maintenance of institute's estate. The cost of training is expected to be around Rs. 2000 per trainee day. The cost norm for training per traineeday is not fixed, it changes from year to year depending upon the budget allocation.

**(x) Central assistance for training programme**

There is a substantial achievement during the year 2004–05. The actual disbursement is more than the target in some years because of the central assistance and national courses reimbursed by Government of India.

**(xi) Referencing WALMI Library**

The decline in reading material issued through the library during 2001-02 and 2002-03 is due to changes in the duration of short term courses, as most of the short term courses are of one week duration and reading materials are not issued to the participants of these short courses.

**(xii) Visitors in WALMI**

The visitors in WALMI are increasing year after year which is a good indicator for the capabilities of the WALMI.

