

## Maharashtra Rural Water Supply and Sanitation Program Maharashtra, India

## Summary

With an intention to provide safe and continuous drinking water to inhabitants of rural districts in Maharashtra, Maharashtra Rural Water Supply and Sanitation Program (MRWSSP) has been initiated in 2014 with the financial support from World Bank and Government of Maharashtra. The main objective of the program is to build institutional capacity with regards to drinking water supply and improve access to quality and sustainable services in peri-urban villages and in water-stressed and water quality-affected areas. To meet the desired targets, the program has invested considerable amount of effort in physical aquifer mapping and community based aquifer level groundwater management. In addition, the program expects to strengthen water quality laboratories in 6 regions of Maharashtra. Similarly, another component of program is focused to software investment through installation of groundwater level monitoring network, real time groundwater level monitoring and strengthening of hydrometeorological stations. Overall, after the accomplishment of program on 2020, approximately 0.59 million people living in semi-urban villages is expected to get high-quality water services while about 0.34 million will get piped water connections to their houses. Similarly, the interventions in water purification could benefit 0.47 million people inhabiting in water-stressed or water quality-affected areas.

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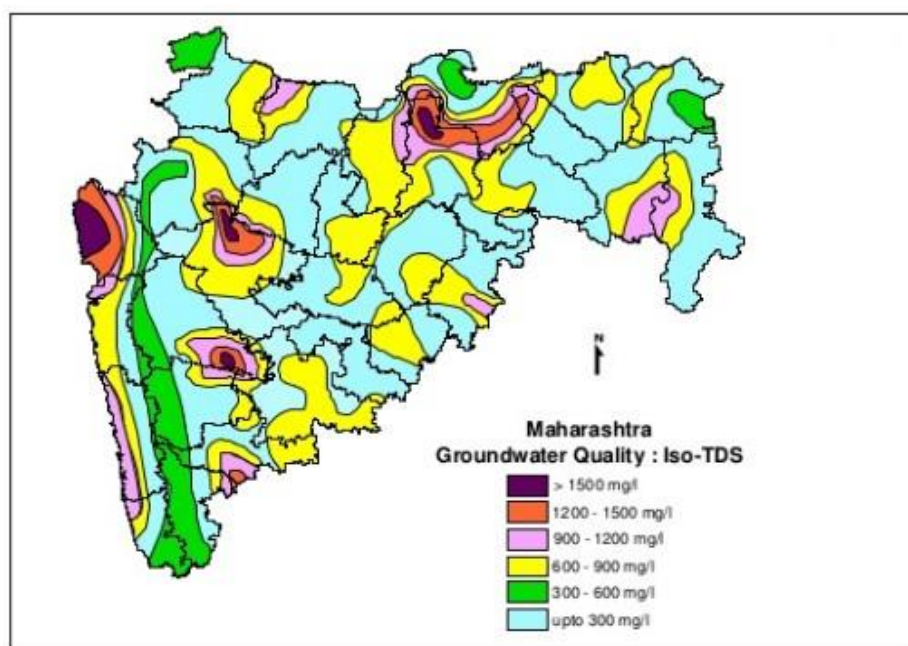
## Acronyms and Abbreviations

<b>AWMA</b>	Aquifer Water Management Associations
<b>DLI</b>	Disbursement Linked Indicator
<b>ERR</b>	Economic Rate of Return
<b>ESSA</b>	Environmental and Social Systems Assessments
<b>GDP</b>	Gross Domestic Product
<b>GoI</b>	Government of India
<b>GoM</b>	Government of Maharashtra
<b>GSDA</b>	Groundwater Surveys and Development Agency
<b>GM</b>	Gram Panchayat
<b>HMS</b>	Hydrometeorological Station
<b>IBRD</b>	International Bank for Reconstruction and Development
<b>IDA</b>	International Development Association
<b>M&amp;P</b>	Monitoring and Evaluation
<b>MJP</b>	Maharashtra Jeevan Pradhikaran
<b>MRWSSP</b>	Maharashtra Rural Water Supply and Sanitation Program
<b>NBA</b>	Nirmal Bharat Abhiyan
<b>NRDWP</b>	National Rural Drinking Water Program
<b>RO</b>	Reverse Osmosis
<b>USD</b>	US Dollars
<b>WSSD</b>	Water Supply and Sanitation Department
<b>WHO</b>	World Health Organisation
<b>ZP</b>	Zilla Parishads

## 1 Introduction

Though India is one of the fastest growing economies in the world at present, its statistics indicate slowing down economy. The Census of 2011 presented that about 70 percent of India's 12 billion people inhabited in rural area. Another prediction estimates that the gross economic impact of inadequate water supply and improper sanitation concerns USD 53.8 billion per year which is approximately 6.4 percent of India's Gross Domestic Product (GDP) during 2006 (The World Bank, 2014). Thus, it is an immediate concern for Government of India (GoI) to improve access to water and sanitation services.

Maharashtra is the second largest state in India in subjects to population where about 112.4 million people reside. Among those, 61.8 million (approximately equal to 55%) inhabit in rural areas. The overall lead agency that determines the policies and raises resources for uplifting performance of drinking water at the state level is Water Supply and Sanitation Department (WSSD). Though more than 98,000 inhabitants in the state are covered by current water supply system, the state continuously faces significant challenges during service delivery because of technical complexities. The major challenges include poor house connections, intermittent water supply, low water pressure and poor water quality. Thus, the Government of Maharashtra (GoM) aligned with GoI's National Rural Drinking Water Program (NRDWP) for water supply and Nirmal Bharat Abhiyan (NBA) for sanitation so as to have access to safe drinking water and sanitation services to rural communities. The Maharashtra Rural Water and Sanitation Program (MRWSSP) is subjected to the tenure of 6 years from 2014 to 2020. An amount of USD 165 million is committed to funding from World Bank while USD 70 million will be funded by Government.



*Figure 1: Maharashtra Groundwater Quality (Source: GSDA)*

The program aims to bridge the professional as well as non-professional skill gaps, system gaps (such as planning, evaluating, monitoring, procurement, auditing, financial management, etc.) and physical infrastructure gaps (such as buildings, furniture, equipment, etc.). In addition, the project would include good global practices with a focus on service delivery using a blend of traditional and engineering management interventions. Thus, the program intends to build institutional capacity for planning, implementation and monitoring of sector through strengthening water

testing laboratories in state, district and sub-district levels, strengthening Groundwater Surveys and Development Agency’s (GSDA) capacities on groundwater management and improving water supply and sanitation service through construction, rehabilitation, augmentation and extension of existing water supplies, scaling up of sustainable groundwater management and construction of water systems in water-stressed areas.

*Table 1: Overview of Maharashtra Rural Water Supply and Sanitation Program*

Items	Description
<b>Project Name</b>	: Maharashtra Rural Water Supply and Sanitation Program
<b>Type</b>	: Water Supply
<b>Donor Name</b>	: i. World Bank, ii. Government of Maharashtra (GoM),
<b>Project rationale and objectives</b>	: i. To improve the performance of Maharashtra as sector institutions in planning, implementation and monitoring of its Rural Water Supply and Sanitation program ii. To improve access to quality and sustainable services in peri-urban villages and in water-stressed and water quality-affected areas
<b>Project Fund</b>	: Total: USD 235 million World Bank: USD 165 million Government of Maharashtra: USD 70 million
<b>Project Duration</b>	: March 2014 – March 2020

## 2 Technical and Technological Brief

The scope of program is broadly divided into two categories, one for institutional capacity building and the other for water supply physical investments. The overall objective of the program is to improve the performance of planning, implementing and monitoring of rural water supply and sanitation as well as improve access to quality water in peri-urban villages of Maharashtra. Since groundwater is the most readily available source of water supply, it is extensively used for domestic, agricultural and industrial purposes. However, occurrence of hard rock formations on about 93% of geographical area limits water yielding capabilities of hard rock compared to alluvial aquifers. Also, practices of growing crops like sugarcane, fruit crops, etc. that need surplus water has depleted underground water.

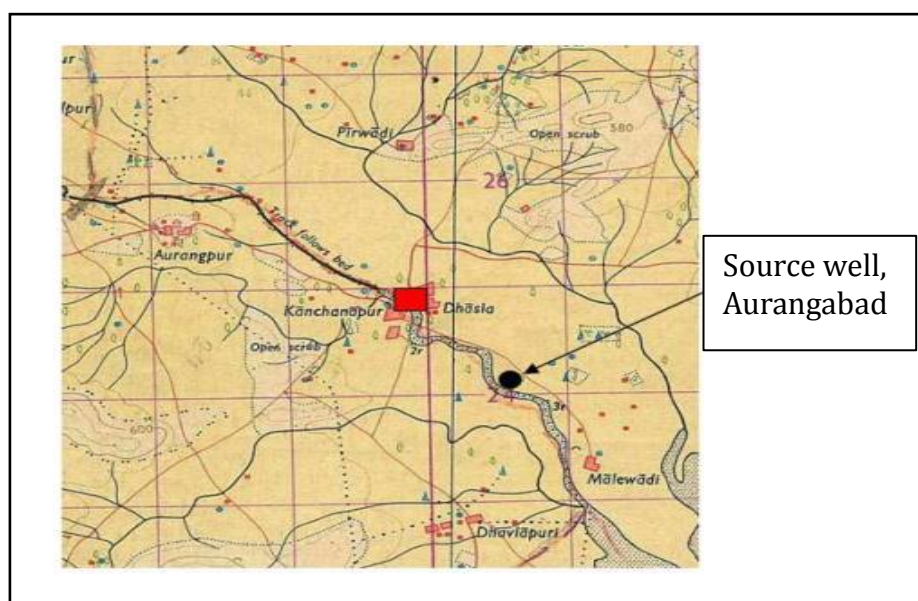


*Figure 2: Water Purification Center*

To solve those problems, the program has proposed different approaches. The technical liabilities associated with these approaches are divided into six components.

- 1) Aquifer Mapping and Community-based Groundwater Management
- 2) Mitigation measures to address water quality issues in water quality affected areas, along with service improvements
- 3) Strengthening of six regional groundwater quality testing laboratories
- 4) Establishing Groundwater Level Monitoring Network in all villages of the state
- 5) Real-time Groundwater Level Data Monitoring
- 6) Strengthening of Hydrometeorological Station (HMS)

The GSDA intends to make groundwater resource maintained at a certain level to enhance sustainability of groundwater based drinking water sources using physical interventions through aquifer mapping from 22 watersheds in 7 districts (namely Pune, Satara, Ahmadnagar, Jalgaon, Aurangabad, Amravati and Buldhana). Likewise, for safe and secure drinking water, different technological options such as Reverse Osmosis (RO) or Nanotechnology have been presented (Groundwater Surveys and Development Agency, 2014). Also, in cases of scanty rainfall or areas with infeasible recharge of storage, a distinct safe source would be selected such that water drawing could be easier. Similarly, for monitoring of drinking water quality, 6 regional groundwater quality testing laboratories are to be set up ensuring the data generated are scientifically reliable. In addition to this, a total of networks of 3920 groundwater monitoring wells would be set all over the state with assessment carried out for four times a year. Technically, chemical contamination and parameters of iron, fluoride, salinity, nitrate and arsenic would be assayed. The data obtained would be collectively used for prediction of water availability and purity. Two districts namely Aurangabad and Chandrapur would be set up for pilot scale implementation of the activities. Eventually, the program also expects to strengthen the existing hydro-meteorological station (HMS).



*Figure 3: Site map of Groundwater Monitoring well in Aurangabad (Source: GSDA)*

### 3 Financial brief

The MRWSSP has been financed by World Bank through International Bank for Reconstruction and Development (IBRD) and International Development Association (IDA) to a total sum of USD 165 million. Of the amount, USD 11.55 million has been disbursed at an interest of 0.2%. The economic rate of return (ERR) is estimated to be 19.14%. Also, the cost during six years of program implementation period has been allocated at 3%, 35%, 44%, 10%, 3% and 5% respectively for each year. As a norm or developing country, a standard conversion factor of 0.9 has been applied to project costs for program evaluation. Also, with no time and cost overrun assumption in implementation phase, the program is supposed to have some savings in total expenditure and time to delivery period. The remaining financial essence of the project will be covered up by GoM which accounts to USD 70 million.

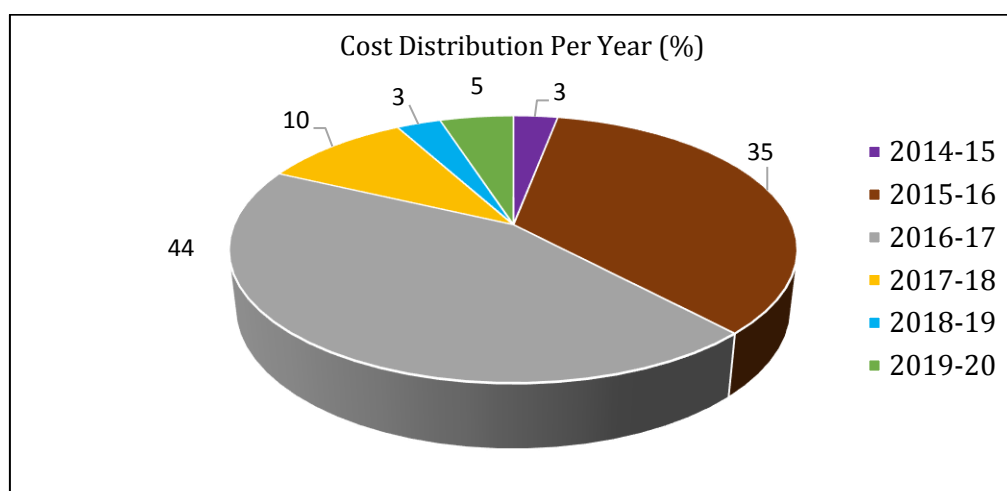


Figure 4: Cost distribution per year

Likewise, the specified amounts to be funded by World Bank have been contracted to be released only after the implemented results are verified and certified by GoM. The amount distribution as per Disbursement Linked Indicators (DLIs) is represented in Table 2.

Table 2: Amount distribution by World Bank as per DLI (Groundwater Surveys and Development Agency, 2014)

DLIs	Description	Amount (USD, in millions)	%
DLI 1	Strengthened M&E System	34	21
DLI 2	Strengthened Capacity of Key Sector Institutions	36	22
DLI 3	Number of House Connections to Commissioned Water Supply System	40	24
DLI 4	Number of House Connections to Sustainable Water Supply System	25	15
DLI 5	Number of Community Safe and Secure Water Systems	30	18
<b>Total</b>		<b>165</b>	<b>100</b>

## 4 Project Features

### 4.1 Technical and technological features

Among the two categories of the MRWSSP, the first one focuses on the institutional capacity building while the other aims in technological development for easier access to drinking water. The major target to sustainable drinking water supply has been expected to be covered up by implementation of aquifer management activities working in coordination with Zilla Parishads and Gram Panchayats. Different sectors such as Aquifer Water Management Associations (AWMA), GSDA and Water and Sanitation Support Organization (WSSO) would involve in selection of aquifer areas such that various structural (physical interventions) and non-structural (demand management/conservation) measures would be taken into consideration. Nevertheless, all the structural interventions such as earthen bunds, weirs, water retaining structures and structures for recharging groundwater that have been supposed to be installed at particular sites will be clearly planned and implemented with the active involvement of community people. At the later stage of program, it expects to supply water from aquifer to individual houses via piped connections.

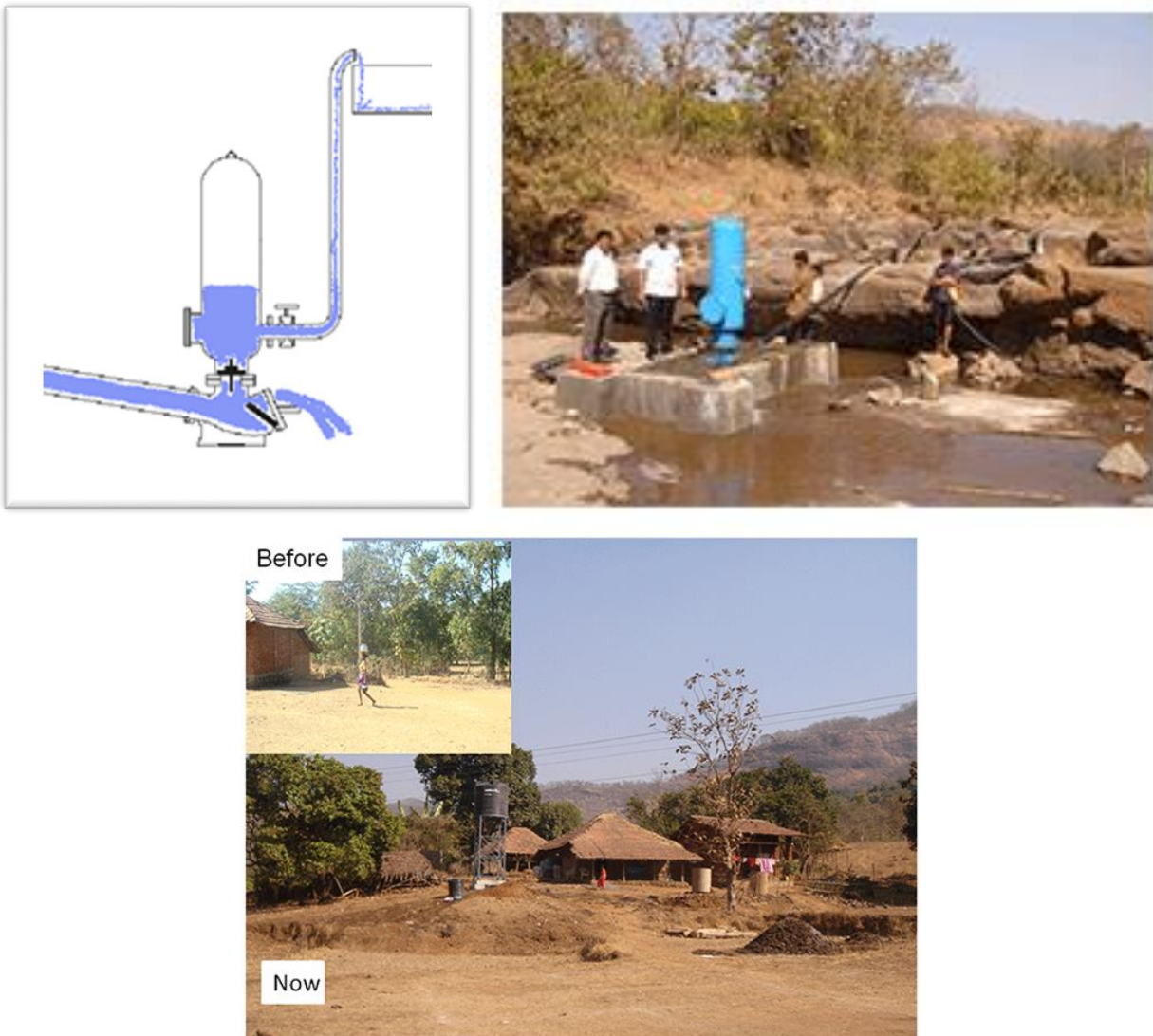


Figure 5: Schematic diagram of hydraulic pump for lifting water (top left); Hydraulic pump installed in Raigad district (top right); Storage tank at Raigad district (bottom) (Source: GSDA)



## **4.2 Economic and financial features**

65 to 80 percent of the annual expenditure on the rural water supply and sanitation sector is expected to be spent through the lowest administrative department of Government of Maharashtra called as Gram Panchayat (GP). However, the balance is spent predominantly through Maharashtra Jeevan Pradhikaran (MJP) running under Government of Maharashtra which covers all large/multi-village schemes. The ultimate financial flow occurs through defined route from the Finance Department of GoM to the expenditure making units such as MJP, GSDA, Zilla Parishad (ZP) and GP.

According to the economic analysis, the improved water supply is supposed to eradicate any needs of water collection and long-term storage which certainly saves time thereby aiding to local income (The World Bank, 2014). In addition, the program will support the governmental efforts for improving and expanding the access of safe water and hygienic sanitation in target areas which justifies the current economic cost associated with the program. To the possible extent, the range of economic benefits associated with safe drinking water and sanitation may rationalize the number of direct beneficiaries in near future.

## **4.3 Social and environmental features**

The program has featured Environmental and Social Systems Assessments (ESSA) working closely with Bank for analysis of GoM's program information, data of field reviews, field study and consultations. In the process, it is expected to interact closely with the local people about the impacts. Moreover, this resource suggests the program be more effective, efficient and transparent. The program critically reviews the risks associated with society and environment and work in close vicinity with regulatory authorities, monitoring units and government officials. The probable risks that could occur during implementation process could be as a result of improper location, planning, execution or management. Thus, the source sustainability, water quality, contamination risks through poor designs, water quality treatment plants, impacts on nearby natural and cultural heritage sites, occupational and public safety risks, dam safety in particular cases, water wastage, etc. would be thoroughly assessed. Moreover, the program would anticipate healthy community participation in construction works, creation of arrangements accountable for service delivery and social audits for promotion of good governance mechanisms. In addition, inclusion of women and girls, as well as economically weakened individuals would support the goals of GoM in enhancing decentralization. Likewise, efforts would be made to minimize community stakeholder's perception in weak participatory decision-making. Any limited negative impact associated with land requirement would be properly compensated to the owner under government program ensuring no significant loss of livelihood were done.

## **5 Project Benefits**

Since Maharashtra is a rapidly urbanizing state with many large villages (i.e. population more than 10,000), there is a higher demand for water services. With the government facing challenges in meeting the needs of water-stressed and water quality affected areas, this program would boost up the management linked to drinking water security during droughts and scanty rainfall. Under this scheme, GoM would expect to expand the frontiers in the sector with a focus on increasing total house connection coverage such that continuous water supply with adequate pressure and minimum quality standards are met. In addition, the program estimates to benefit each individual in rural population group in having access to safe water and basic sanitation. Thus, a total of about one million people of 12 selected districts are expected to benefit from program interventions. An estimation of about 0.59 million people living in semi-urban villages is expected to get benefits from high-quality water services. Also, at least 0.34 million will get

piped water connections to their houses. Similarly, the interventions in water purification and rainwater harvesting could benefit 0.47 million people inhabiting in water-stressed or water quality-affected areas. In addition to these direct benefits, various social and gender groups are expected to be benefitted through institutional capacity building interventions as a part of the program. The overall social impact of the program is also expected to be positive since the time spent in collection of water by women and minorities can be utilized in productive works. The effective information dissemination, improved health and personal hygiene, increased public participation, etc. signify positive outcomes of the program.

## **6 Implementation status of the project**

After about three years of implementation of the program, significant advancements have been made as per the objectives. However, due to earlier delays because of several reasons, there has been slight hindrance in the progress. Nevertheless, the program development objectives, program boundary and overall results are still exact and technically sound. Some adjustments are proposed so as to incorporate revised targets, requested re-allocations on DLIs and maintain exchange rate fluctuations. The monitoring and evaluating (M&E) system as a component of the program has included three core modules like sector performance, contract management and financial management in four districts as a testing phase by March 2017. Other features would be fully developed and tested in later half of 2017 and the pilot had been expected to be completed by May 2017. With additional 20 schemes for home connections to a commissioned water supply system, the revised target has been proposed of 78,500 in numbers. Similarly, in terms of improved planning processes, the testing has been carried out in 2 districts for planning and 4 districts for piloting M&E. However, 10 districts are expected to adopt the system by September 2017 and their verification to be done by December 2017. For attaining sustainable water supply, no significant achievements have been made since the peri-urban scheme implementation has not been effective at the moment. Also, no housed connections and meter connections at present are under construction but as soon as the schemes are completed, progress is started to pick up as soon as possible.

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