



# **International Journal of Advanced Research in Education and Technology (IJARETY)**

**Volume 12, Issue 2, March-April 2025**

**Impact Factor: 8.152**



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# Improvement in Water Supply System in Saline Track Area Case Study of 105 Villages R.R. Water Supply Scheme in Amravati District

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**ABSTRACT:** 105 Villages R.R. Water supply scheme is a multi-villages water supply scheme commissioned by MJP in year 2012 under Bharat Nirman Program of government of India. The M & R of this scheme is towards MJP including recovery of water tax. Most of the included villages in this scheme are quality affected & from saline track area. This scheme was designed with 40 LPCD rate of water supply. Since last few year villagers are not satisfied from the quantity of water which they are getting through this scheme. Now “Jal Jeevan Mission” program is launched by government of India. Target of the government is to supply water to villagers at 55 LPCD & “Har Ghar Jal”. Under this program MJP is retrofitting this scheme with 55 LPCD rate of water supply. The aim of the proposed research work is to study that increase in rate of water supply by 15 LPCD is sufficient to solve the problem of villager living in saline track area.

## I. INTRODUCTION

The existing water supply schemes drawing water from canals or rivers as a source shall have to be converted to draw water from storage reservoirs with closed conduits in a phased manner. Integrated use of other sources including groundwater shall also be explored. It has been observed that Ground water of some areas in Maharashtra state specially some villages of Amravati, Akola and Buldhana districts comes under saline track area. Some villages of Amravati district i.e. in Daryapur, Anjangaon, Bhatkuli, Amravati, Chandur Bazar & Achlapur tahasil come under saline track area. Underground water of this area is not suitable for drinking purpose or irrigation purpose due to high salinity.

## II. ATTEMPTS TAKEN BY GOVT

Some attempts are already taken by government to convert saline water into potable water. One treatment unit was installed on trial basis at village Waygaon, Tq.Bhatkuli, but results was not so good. Now treatment unit is not in working. It is a major problem to water supply department to solve the drinking water problems of this area. Water supply department of Maharashtra state is implementing piped water supply schemes for this area from last few decades. Some water supply scheme was implemented to solve the problems of saline track villages of Amravati district.

### EXECUTION OF SCHEME:

As per the terms & conditions included in administrative approval implementing agency is MJP. M & R of the scheme will be done by MJP after completion of the scheme as earlier. After completing the tender procedure work is entrusted to contractor for execution of the scheme including providing all types of pipes, material & labours etc. Time period as per tender condition is 2 years for execution of work & 1 year M & R after execution. Work order is issued to contractor on 15 July 2022 & date of starting of work was 18 July 2022. Execution of the scheme is in progress.

### COMPLETION OF SCHEME: -

As per tender condition scheme is commission in March 2012 & started the water supply to villages one by one. Most of villages started up to May 2012. While execution of the scheme 4 villages (Alangaon, Rohankhed, Donand, Nandura Laxkarpur) are deleted as these villages are affected due to construction of Lower Pedhi Irrigation Project, Tq. Bhatkuli. The scheme was maintained by contractor up to October 2014. From November 2014 MJP is doing M & R of the scheme & recovery of the water tax from consumers through another contractor.

#### BENEFIT OF SCHEME: -

Most of the villages included in this scheme are under saline track. The scheme commissioned in 2012 was as per 40 LPCD and there was no provision for other demand i.e. cattle demand, institutional demand and hospital demand except domestic demand. Scheme was designed for ultimate year 2023 which is already crossed therefore people are not getting sufficient water to fulfill their requirements now scheme is designed as per 55 LPCD for ultimate year 2055 hence people will get more water from this scheme after completion of the work.

### III. PROPOSED METHODOLOY

#### Materials and Methods: -

Objective of the research is to study the DPR of 105 Villages R.R. Water supply scheme (Retrofitting) which is prepared by MJP & Administrative approval is given by government of Maharashtra.

#### Methods: -

1. To obtained DPR by MJP.
2. To carry out socio economic survey in some villages.
3. To get information of local sources if any.
4. To study what are the actual water requirements of villagers and what is paying capacity of villagers against water tax.
5. To know expectations of villagers from water supply scheme.

#### POPULATION: -

The scheme is designed on the basis of population villages as per census 1971 to

2011. Village wise population is shown in table No. 3.1. Total population of included villages is as below.

As per census	2011	:-	207815
Immediate stage	2024	:-	228779
Intermediate stage	2024	:-	261761
Ultimate stage	2054	:-	299269

### IV. RATE OF WATER SUPPLY

As per CPHEEO manual & norms of *Jal Jeevan Mishan* Retrofitting scheme is designed at the rate of 55 LPCD. Now there is a additional provision for Institutional demand, cattle demand and demand for hospitals and dispensaries etc.

#### WATER DEMAND: -

Particulars	2024	2039	2054	Unit
Population	238600	273487	313189	Souls
LPCD (Rural / Urban)	55 / 135	55 / 135	55 / 135	Liters
Domestic Demand	13.909	15.980	18.339	MLD
Institutional Demand	1.457	1.676	1.927	MLD

Cattle Demand	1.594	1.753	1.929	MLD
<b>Total Net Demand</b>	16.960	19.409	22.195	<b>MLD</b>
Demand at ESR (Considering 10% Losses)	18.844	21.566	24.661	MLD
Demand at MBR (Considering 1% Losses)	19.034	21.784	24.910	MLD
Demand at WTP (Considering 1% Losses)	19.226	22.004	25.162	MLD
Demand at Headwork (Considering 3% Losses)	19.821	22.685	25.940	MLD
<b>Say</b>	<b>19.90</b>	<b>22.70</b>	<b>26.00</b>	<b>MLD</b>
<b>Yearly Requirement</b>	<b>7234.66</b>	<b>8280.02</b>	<b>9468.10</b>	<b>MLD</b>
	<b>7.235</b>	<b>8.280</b>	<b>9.468</b>	<b>MM<sup>3</sup></b>

#### REVISED (Retrofitting) WATER SUPPLY SCHEME

##### 4.1 GENERAL: -

Proposed (Retrofitting) water supply scheme means the multi villages (RR) water supply scheme which is administrative approved by Govt of Maharashtra on 11.01.2022 vide

G.R. No. J.J.M.-2021/Pra.Kra.171 /W.S-13, Mantralaya Mumbai and which was technically sanctioned by Chief Engineer, MJP Region, Amravati on 08.12.2021 vide letter No. CE/MJP/Amt/DB/TS/2224/2021. The work order is issued to contractor by Executive Engineer, MJP water Management Division Amravati vide letter No. TC/3328/2022 dated 15.07.2022. This scheme is named as “*Augumentation to 105 Villages R.R. Water supply scheme*” though the No. of included villages in this scheme are one hundred & seventeen. The sanctioned cost of this scheme is Rs.141.35 Crore (Net) and Rs.158.31 Crore gross including 12% GST charges i.e. Rs.16.96 Crore.

*Jal Jeevan Mission* is a ambitious & time bound programme of Government of India and it is being in implementation at a time all over in India. Therefore there is a shortage of pipes, material, and skilled labours required for construction of water treatment plants, ESRs, pipelines of large diameter etc. It becomes necessary to revise the scheme due to following reasons.

1. Due to shortage of DI Pipes it becomes necessary to replace the DI pipes by using other types of pipes i.e. PCCP, BWSC, HDPE pipe etc.
2. Rate of GST is increased from 12% to 18% hence cost is increasing.
3. Contractors offer is 31.81% above on tender cost.
4. Five more villages are included in the scheme as per demand of public representative .
5. Proposed land required for construction of Water Treatment Plant was not available, hence it is decided to construct the Water Treatment Plant at nearby available land of department.
6. Proposed land required construction of RCC ESRs at some villages is not available hence respective Grampanchayat changed the spot of ESRs.

##### COVERAGE: -

This scheme covers the 117 villages of 4 talukas of different categories. Talukawise & category wise description of included villages are as below.

Taluka	No. of included villages in Existing Scheme	No. of villages added	No. of included villages in Proposed Scheme
Chandur Bz.	23	4	27
Bhatkuli	57	4	61
Achalpur	4	0	4
Amravati	21	4	25
<b>Total</b>	<b>105</b>	<b>12</b>	<b>117</b>

FINANCIAL PATTERN: -

This scheme is under Jal Jeevan Mission of Govt. of India but it was not fully funded by Central Government. Financial pattern is as below.

Sr. No.	Name of Scheme	No. of included villages	Cost of Revised Scheme	Share of GOI	Share of GOM	Public Contribution
1	105 Villages R. R.W.S. Scheme (Revised)	117	186.14	93.07	93.07	10% cost of ESR & Distribution system shall be deposited in separate a/c of G.P 7 to be used for M& R
				186.14		2.92

SOURCE: -

There is no change in the source of the scheme and Purna medium project at Vishroli village Tq. Chandur bazar is surface source of this scheme.

POPULATION: -

The scheme is designed on the basis of population villages as per census 1971 to

2011. Village wise population is shown in table No. villages is as below.

3.1. Total population of included

As per census	2011	:-	219953
Immediate stage	2024	:-	246788
Intermediate stage	2024	:-	280022
Ultimate stage	2054	:-	316217



**RATE OF WATER SUPPLY: -**

As per CPHEEO manual & norms of *Jal Jeevan Mishan* Retrofitting scheme is designed at the rate of 55 LPCD. Now there is a additional provision for Institutional demand, cattle demand and demand for hospitals and dispensaries etc.

**WATER DEMAND: -**

Particulars	2024	2039	2054	Unit
Population	246788	280022	316217	Souls
LPCD (Rural / Urban)	55 / 135	55 / 135	55 / 135	Liters
Domestic Demand	14.360	16.340	18.505	MLD
Institutional Demand	1.444	1.584	1.739	MLD
Cattle Demand	1.669	1.837	2.018	MLD
Hospital Demand	0.106	0.116	0.127	MLD
<b>Total Net Demand</b>	<b>17.579</b>	<b>19.877</b>	<b>22.389</b>	<b>MLD</b>
Demand at ESR (Considering 10% Losses)	19.532	22.086	24.877	MLD
Demand at MBR (Considering 1% Losses)	19.752	22.334	25.156	MLD
Demand at WTP (Considering 1% Losses)	19.976	22.588	25.442	MLD
Demand at Headwork (Considering 3% Losses)	20.681	23.385	26.340	MLD
<b>Say</b>	<b>20.700</b>	<b>23.400</b>	<b>26.400</b>	<b>MLD</b>
<b>Yearly Requirement</b>	<b>7548.56</b>	<b>8535.52</b>	<b>9614.10</b>	<b>MLD</b>
	<b>7.549</b>	<b>8.536</b>	<b>9.614</b>	<b>MM<sup>3</sup></b>

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## International Journal of Advanced Research in Education and Technology

**ISSN: 2394-2975**

**Impact Factor: 8.152**