

# Malkapur 24 X 7 Water Supply Scheme

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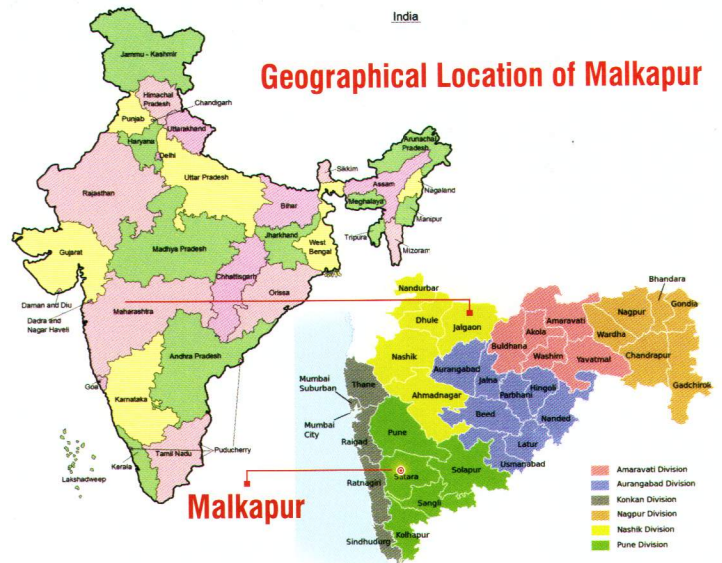
# I N D E X

Sr. No.	Particular	Page No	
		From	To
01	Introduction	04	04
02	Scheme Details	05	05
03	Key Plan	06	06
04	Strategy Adopted	06	07
05	Impact of initiatives	07	13
06	Role of various stake holders	13	14
07	Benefits resulting from the project	14	20
08	Scope of sustainability	20	20
09	Replicability	21	21
10	Awards	21	22

# SUCCESSFUL IMPLEMENTATION OF 24X7 WATER SUPPLY CONCEPT IN MALKAPUR WATER SUPPLY SCHEME

## Introduction

Malkapur town is situated along NH-4 adjacent to the area of 'Historical Agashiv Hills' situated on the boundary of town Karad in District Sarata of Maharashtra state. Malkapur is fast growing town because the adjoining Karad city does not have sufficient land available. Also Malkapur has industrial as well as business establishments, such as Krishna Hospital, Emerson Industries, Educational Institutes, some big hotels, co-op societies etc. Hence people prefer to settle at Malkapur now a days.



Original combined water supply scheme for Malkapur & Nandlapur village was executed in year 1988, for projected population of 14000 @ year 2010 by adopting Koyana River as perennial source . In addition to this, the extended Malkapur town area was supplied water through 11 borewells. The rate of water supply was 40 LPCD.

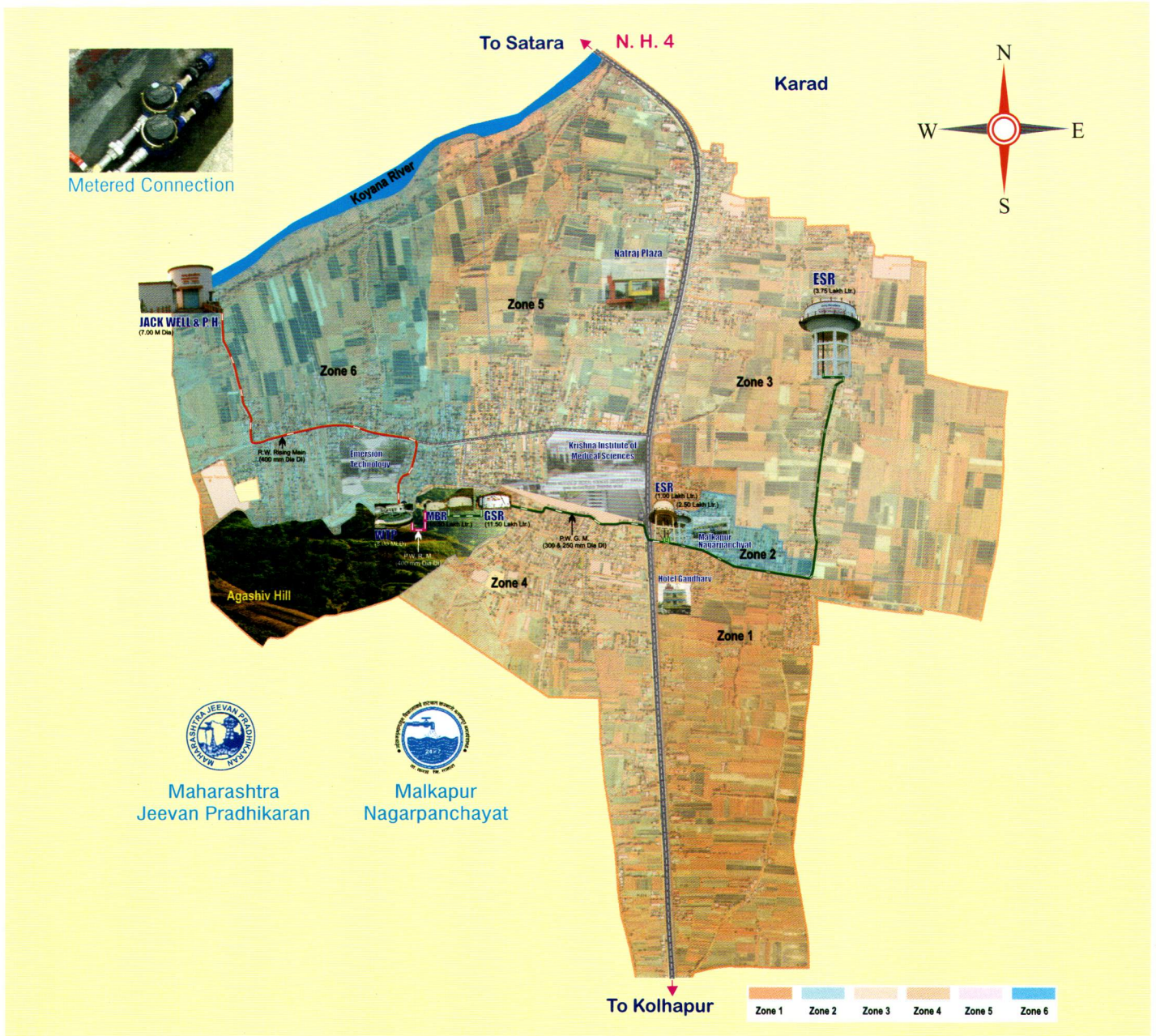
The above mentioned existing water supply scheme was found insufficient to cater the increased water supply need. Hence as per the demand of people of Malkapur Grampanchayat, it was decided to plan and execute 24x7 Water Supply Scheme by adopting Koyana River as perennial source and accordingly the proposal was framed for a projected population of 67196 for year 2037 and submitted to Govt. for approval.





Scheme Details		
<b>1</b>	<b>Cost</b>	
	Original	Rs 947.54 lakh ( Adm. Approval dt. 9/6/1999)
	Revise	Rs. 1225.13 lakh ( Adm. Approval dt. 3/8/2008)
	Re-revise	Rs. 1402.92 lakh ( with Govt.)
<b>2</b>	<b>Financial Pattern</b>	
	Govt. share	90%
	Popular contribution	10% (122.00 lakh collected till date )
<b>3</b>	<b>Population</b>	
	Year 2011	31713
	Year 2037	67196 ( ultimate )
<b>4</b>	<b>Rate of water supply</b>	70 LPCD
<b>5</b>	<b>Pumping hours</b>	12 (daily )
<b>6</b>	<b>Work executed</b>	
	<b>A)Head works</b>	
	Intake well	3.00 m dia (RCC)
	Inspection well	3.00 m dia (RCC)
	Connecting Pipe	750 mm dia (CI) L - 55 m
	Approach Bridge	45 m. Length (RCC)
	<b>B) Pumping Machinery</b>	
	Raw water	150 HP (VT) Discharge- 3.25 Lakh Ltr./Hr
	Pure water	75 HP (VT) Discharge- 3.08 Lakh Ltr./Hr
	<b>C) Rising main</b>	
	Raw water	400 m.m. DI L- 1840 m.
	Pure water	400 m.m. DI L - 155 m
	<b>D) Water Treatment Plant</b>	Capacity - 8.00 MLD
	<b>E) Gravity Main</b>	400 to 250 mm DI L- 3520 m
	<b>F) ESR/ GSR</b>	Total - 06 nos, Cap- 36.75 Lakh Ltrs.
	<b>G) Distribution System</b>	
	300 To 150 mm D.I.	L - 8.06 km
	140 To 75 mm HDPE	L - 67.17 km
	Domestic water connection (MDPE pipe & with AMR water meter )	Nos - 5997
<b>7</b>	<b>Total expenditure incurred</b>	<b>Rs. 1398.45 Lakh</b>





## Strategy Adopted

The Malkapur water supply distribution was planned, designed, constructed and is being operated with following strategy in mind.

- 1) **The consumer shall get the water whenever he opens the tap** - This strategy provides for the service availability whenever consumer desires. The consumer in different trades needs water at different times of the day. The intermittent system provide water at fixed hours or at varying hours (if the scheme is in chaos like Malkapur). This requires citizens to adjust their schedule according to the time at which water is available. It leads to missing economic opportunities or any other opportunity during that period. It was, therefore, thought to make available water at the tap of the consumer 24 x 7. The strategy is also aimed at making redundant the concept of storing of water and throwing it away the next day when fresh water is received and to stop the investment required in storage vessels / tanks.



- 2) **Provide good health to the citizens through good quality potable water** - Every piped water supply system endeavor to provide good quality potable water. The intermittent systems, in non supply hours, gets depressurized resulting in outside contaminants entering the pipes from the spots where leakages have occurred. The 24 x 7 pressurized systems do not fall pray to this situation, thus the quality of water delivered is assured all the time.
- 3) **Consumer pay as they use** - This principle of consumer paying as per their usage provide the incentive for resource conservation. The metered water supply system provide an opportunity to charge as per the volumes of water consumed, unlike in un-metered flat rates, where quantity consumed is not the criteria. This makes the consumer in metered system try to minimize the usage by closing their taps no sooner their requirement is fulfilled. This helps the pressure in pipes to be maintained and the consumer located at higher elevation do not suffer. This tries to establish equity amongst consumers.
- 4) **Pay at higher rate when using higher per capita water** - The telescopic rates adopted requires the higher per capita usage of water to be paid at higher rates. The minimum required water is provided at affordable rates. Thus the poor are taken care, while they also enjoy the benefit of 24 x 7 water availability. This recycles the wealth from the rich to the poor. This strategy is enforceable through the micro mapping of number of persons in each house and the AMR meters provided in the system.
- 5) **The service to work on no loss basis** - The water supply service was advised not to be run in loss. The rates were to be determined accordingly. Great care was also needed to keep operational expenditure to its minimum.

## Impact of Initiatives

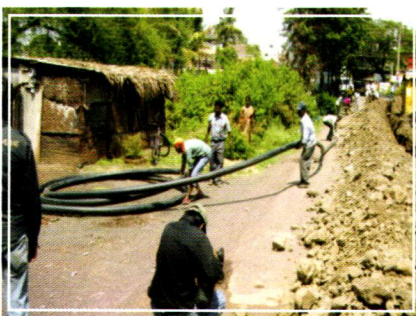
The augmentation to the water supply system was approved on 9th June 1999 for Rs.947.54 Lakhs. However the work could not be started till 17th Dec 2002, due to paucity of funds. The system is designed to provide 55 LPCD water for population of 67196 souls expected in year 2037. The bulk water system consisted of water abstraction from perennial river Koyna, pumping it to water treatment plant at the rate of 3.25 Lakh ltr/hr (8 MLD), through D.I.K-9 pipeline of 400 mm dia. The pumps are of 150 HP. The W.T.P. having conventional alum dosing, flocculation, coagulation sedimentation filtration and disinfection by chlorine is adopted. The treated water is pumped to the Master Balancing Reservoir located on the hill. The treated and disinfected water from this tank is transferred to the 5 service reservoirs covering six zones of distribution. The treated water pumps are of 75 HP. The system up to ESR was ready by Jan 2005 and the water supply through the existing distribution system was started.

The last of the work but important from the point of view of service delivery was distribution network. The approved project provided distribution system in PVC pipes. This work being directly



related to the consumer satisfaction, the latest concepts in distribution network were discussed with the elected representative of the Village Panchayat (now Nagar Panchayat). They were provided information about the 24 x 7 water supply system, the pipe materials, which are useful in helping the system to operate 24 x 7. The house service connection material and methodology, the metered delivery of water and charging the consumer on volumetric basis were also explained. The Sarpanch and the elected representatives were taken to Badlapur near Mumbai, where effort to convert existing intermittent system into 24 x 7 was started by MJP in some wards. They visited and experienced for themselves and got the feedback from the consumers of Badlapur. After having satisfied they were eager to deliberate the matter in their council, and agree for 24 x 7 system with metered water supply and tariff as per actual consumption. The village Panchayat met and resolved accordingly vide their resolution in Gramsabha dated 26th Jan., 2007.

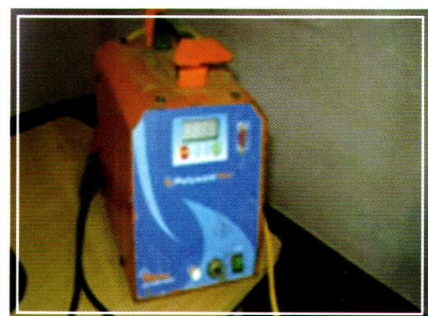
The Panchayat was explained about the HDPE pipes of very good quality to be used for distribution network. They were also made aware that the pipes will come in roll of length 50 m to 100 m and there will be reduced number of joints which will help in reducing the number of possible leakage spot in the pipeline. They were also transparently informed that 20 to 25 years back HDPE pipes were used in Maharashtra but failed in large percentage due to quality of pipes and jointing procedure. They were also informed how the new methods and equipments of jointing can make leak proof pipeline. The Village Panchayat was also given idea about how the service connection on the HDPE pipes will be taken by fusion welded tapping tee provided with ferrule and followed by leak proof compression fitting, a single length MDPE blue pipe from ferrule to the meter in the premises of consumer, the AMR meter, its method of taking reading etc. The complete transparency by MJP could make Panchayat fully aware of the quality, workmanship, the equipments and the results that are going to be achieved.



**HDPE Pipe in coil**



**Jointing of Pipes Electro fusion coupler**



**Electro-fusion Machine**

After having agreed to the system, the distribution network was designed using “Water Gems” software. This software apart from design for steady state flow, also models the system according to the given pattern of usage of water at the different time of the day in the 24 x 7 availability. This gives the design of the system as a whole i.e. ESR and distribution network. The software uses Darwin designer which is a generic algorithm. It provides multi criteria optimization. The criteria being



performance and cost. The solutions provided by the software are ranked. This allows the user to choose the best solution which suits to his requirement of pressure and availability of money.

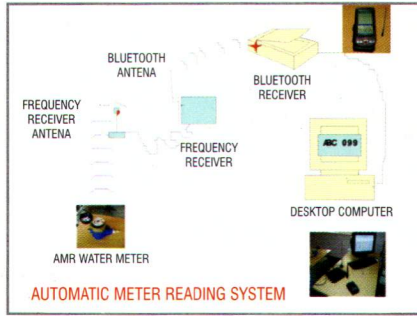
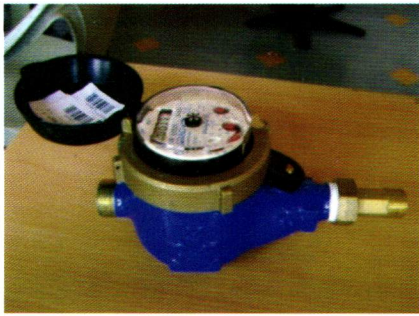
Post design & estimate, a comprehensive tender for distribution network in HDPE pipe, house service connection in MDPE pipe with AMR meter, bulk water meters of AMR type was invited from the large scale manufacturers of HDPE pipes, having collaboration with the manufacturer of AMR meters. The criterion for performance was also kept in terms of the leakage in distribution network. An incentive/ penalty clause with bench mark leakage level of 5% was kept. On completion of the system it is to be operated by the manufacturer for a period of 2 years and the leakage level have to be reported every month.

The work was awarded to M/S Kimplas Piping System, Nashik through competitive bidding. Kimplas apart from manufacturing quality P.E. pipes also manufactures the P.E. couplers, specials and tapping tee suitable for fusion welded joints. The AMR meters of M/s. ARAD of Israel was agreed to by M/S Kimplas. The work order was given on 7th Dec 2007 and the actual work was started on 8th Mar 2008. The resin to be used for manufacturing the pipes was specified in tender of Borealis Co., which is one of the best resins in the world. The tender condition was incorporated that resin shall be tested by "Bodykote", the international agency for testing resins and test certificate to be given before using. A visit of elected representatives of the village Panchayat was arranged to factory at Nashik, prior to starting of manufacturing. They were shown all the facilities including quality assurance and quality control methodology, the resin to be used etc. This gave a complete transparency. Before starting the manufacture, the engineers of MJP and of village Panchayat jointly verified the imported resin, its batch number and correlated with the batch number mentioned on the test certificate. While the manufacturing was going on, the representatives and engineers of MJP used to be present in the factory to confirm that the resin imported for Malkapur is only being used for manufacturing the pipes. The third party inspection was also kept essential as per the tender clause and the agency namely "Iteng" inspected the pipes and issued their certificate. These pipes were conforming to IS 4984 for HDPE PE 100 pipes and ISO 4427 for MDPE blue pipes for connections.

The AMR meters were shown by M/s. ARAD to the village Panchayat representatives and the MJP engineers. The working of the meter was explained and how the readings on the meter can be remotely read through the handheld device using Radio Frequency was demonstrated. All the queries of the engineers and elected representatives were answered. These meters were also third party inspected by "Macharot" of Israel for first lot and by "SGS international" for second lot.

Each water connection has been installed with automatic meter readers(AMR), which take meter reading with the help of radio frequency within the radius of 200 m. It is not necessary to go to the meter for taking readings. The data is fed into computer and accordingly water bill is processed. Since there is no any manual interference to take readings, the billing is accurate.





**WATER TREATMENT PLANT  
(8.00 MLD)**

**DOMESTIC WATER  
METER**

The actual work in the Malkapur town was started in Mar 2008 and the programme for completing each zone in all respect was chalked. Accordingly the pipelines were laid and zone by zone the system was commissioned as below.

- Zone No. 5 (Part).....Aug 2008
- Zone No. 5 (complete) and Zone No. 6..... Dec 2008
- Zone No. 2 and Zone No. 3.....Mar 2009
- Zone No. 1 and Zone No. 4.....May 2009

Accordingly the projected demand of Malkapur city for year 2037 for population 67196 was calculated @ 70 LPCD and the scheme was framed, designed and approved by Govt of Maharashtra. The distribution system network was designed hydraulically by adopting 'Water Gems' Software as per the requirement on proposed distribution nodes. The distribution system was divided in six zones, topographically and accordingly scheme was executed and commissioned in Aug- 2008.





The distribution system was laid by adopting HDPE pipes, available in 50-100 m coil lengths, which reduced into lesser joints, the jointing was done by electrofusion method.

The consumer connections with ferrule were done by adopting continuous MDPE pipes using electrofusion method.

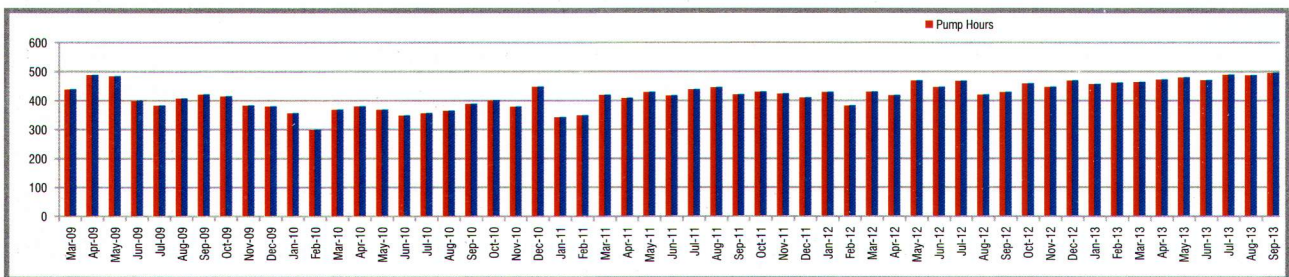


**Various difficulties were faced during the implementation of the project which included following major difficulties.**

- i) The Gram Panchayat was upgraded to Nagar Panchayat, resulting in dissolution of the elected body. This led to unavailability of people's representative to co-ordinate. The Govt. of Maharashtra, through an order, formulated a committee of all party representatives to help the project go ahead.
- ii) During the election of newly formed Nagar Panchayat, 37 consumers denied to fix the meters. There was no go till the election was over. Consequent to election, all these 37 themselves requested to fix the meters.
- iii) The number of consumers in the system before starting the project were 2950 and the project included transferring these connection on the new pipelines using AMR meters, MDPE pipes tapping tee, ferrule etc. However, during the project period 222 No. of additional connections were given by the Panchayat and around 450 new connections were lined up, hence additional money was required for these meters. The same was agreed partly through the project and partly from the MPLAD programme where Hon. Central minister Shri Prithviraj Chavan, allocated these funds.
- iv) Consequent to commissioning some zones in 24 x 7 water availability, it was not possible to implement metered tariff for these zones, while keeping flat rates in the 'still to be commissioned un-metered areas'. The project was therefore accelerated and all the zones were commissioned by 5/09.
- v) It was experienced that the number of hours of pumping was getting increased when system was operating 24X7 in commissioned zones but still in the flat rate tariff regime. The people started



using excessive water. No proper float stop cocks for overhead tanks etc. was leading to overflow of water and also wastage of water. The drive was therefore taken to convince people either to fix the proper stop cocks to the overhead tanks or simply by pass them, as the pressure is adequate to bring the water directly to the tap even at the third floor. The continuous water supply was maintained even though it was overflowing or misused by the people. This was essential to make them assured that “now there will be no outage in water supply”. The continuous experience could convince them that fixing proper stop cocks to the overhead tanks is essential. The team of Panchayat employees and MJP engineers visited all the houses and listed such places where these problems occurred. They convinced them not to use the over head tanks at all, as the quality of water provided through the 24 x 7 system is far superior and it may get contaminated if the over head tanks are not covered properly OR the children playing on the terrace may put some dust in it OR the birds may try to use the water if they are un-covered. They were also informed about the washing of overhead tank etc. and if it is not carried out timely then the water get contaminated. This drive of making people aware yielded success and the people chose to fix ball stop cocks or by pass their over head tanks. This started reducing number of pumping hours.



**(Graphical Representation of Reduced Pumping Hours)**

- vi) Then came the issue of setting of proper water tariff so as to curb excessive utilization of water by the consumer. Telescopic tariff with Rs.7/- per 1000 liters up to first 70 LPCD, Rs.10/- per 1000 liters for consumption between 70 to 100 LPCD and Rs 14/- per 1000 liters for consumption beyond 100 LPCD was proposed by MJP; to the elected representatives of Nagar Panchayat. There was informal discussion in which there was a school of thought to keep less number of steps than three and decrease the rate. It was explained by the MJP that, having gone through the phase, when the flat rate tariff was there, and the water was 24 x 7; there was continuous increase in hours of pumping. Unless the higher consumption is curbed by keeping higher rate; the water supply system capacity may stand insufficient to the excessive demand by the citizen and in that case there will be no 25th hour in a day.



The elected representatives could appreciate this situation and agreed for 3 slabs. However they modified slabs and reduced the rates as :

## Current Telescopic Tariff

### Domestic

- |  |                   |
|--|-------------------|
| 1) Monthly consumption up to 12600 lit | Rs 04=50/1000 Lit |
| 2) 12601 to 22500 lit                  | Rs 07=00/1000 Lit |
| 3) Above 22500Lit                      | Rs 10=00/1000 Lit |

(The consumers who so ever consume water less than 9900 Lit in a month are eligible for getting 15% discount.)

### Commercial

- |                               |                   |
|-------------------------------|-------------------|
| 1)Only Hotels                 | Rs 09=00/1000 Lit |
| 2)Hotels with dining          | Rs 14=00/1000 Lit |
| 3)Star Hotels, Hospitals etc. | Rs 20=00/1000 Lit |

The image shows a water bill from Malapur Nagar Panchayat. The bill includes fields for consumer name, address, meter number, and consumption details. Below the bill is a collage of educational advertisements, including one for 'चाटे कोचिंग क्लासेस' (Chate Coaching Classes) and another for 'दहावी' (Dahavi) coaching.

They also made a very good suggestion and implemented it. The suggestion was 'who so ever uses water @ 55 LPCD or less, will be given a 15% discounted rate'. Rates for commercial connections were decided as Rs 9, 14, and 20 per 1000 lit depending on type of activity. The elected representative and MJP engineers formed teams and conducted ward wise meetings of consumers and ladies in particular and explained them the benefits of having 24 x 7 water supply. They were also explained that the telescopic rates will help them in avoiding the wastage of water. The charges will be only for the water they use actually as read by meter as against the earlier flat rates, where people who conserved water was not getting reward. This mass awareness campaign and telescopic tariff put together, reduced the consumption to such an extent that the 19-20 hrs. of pumping is reduced to 13 hours and the 24 x 7 water supply is possible at average LPCD of 110.

## Role of Various Stake Holders

It can be seen that by accepting and agreeing to the 24 x 7 metered water supply concept, the Village Panchayat/Nagar Panchayat elected representatives played an important role to implement the idea. The MJP played the most vital technical role. Its Chief Engineer, right from conceiving the idea, bringing it on drawing board, implementing it, and then strategically pushing the decisions in a manner that the transformation becomes continuous & sustainable, played an unparalleled commendable role. The MJP's engineers on the site played important role in keeping the complete transparency with the Panchayat in executing the project and operationalizing the plan as per the micro detailing and directives of the Chief Engineer. The Panchayat and MJP whole heartedly pursued the initiative as a single team. The Govt. of Maharashtra provided full support for making this pilot - project a success, by upholding the ideas and providing the necessary funding through ARWSP of Govt. of India and from Govt. of Maharashtra. The Member Secretary, MJP helped in imparting the



education for using the “Water Gems” software and designing the system himself when he was Chief Engineer. The P.E. pipes industry, M/s. Kimplas helped in keeping complete transparency by allowing the elected representatives, the engineers of MJP to visit their factory and explained their manufacturing and quality. They also allowed representatives of MJP and Panchayat to remain present while the manufacturing of pipes was going on, so as to satisfy them of the fact that the resin imported for Malkapur is only being used. The after sale support from M/s. ARAD Meters, Israel and M/s. Kimplas is notable. The media also played an important role in providing the factual information to the citizens and consequently to whole of the Maharashtra about the initiative. The technical forums like international conference of IWWA and the Monthly, “Asian water” of Singapore also helped the concept to be put in front of international audiences and readers. The visual media channel CNBC also made documentary for international display. The important role played is by the people of Malkapur who remained very active throughout the project implementation, commissioning and sustainability phase. They tried to understand the ideas, importance of the 24 x 7 availability of water, appreciated the quality of water, kept a watch on quality and workmanship of the works getting executed. The ladies in numbers came forward to attend the ward wise meeting and understand the concept of paying for water whatever they use and in turn conserving the water. The citizen could fully appreciate the logic of telescopic rates, and after having completely understood, they themselves have now become the champions for such systems while answering to the queries of their relatives coming to them from distant places. The role of the ex-MLA and veteran freedom fighter, Shri Bhaskarrao Shinde was of the continuous inspiration. His confidence in the team of MJP and Panchayat, his persuasion for the difficulties to be sorted out at all the levels could only achieve the fete. The Panchayat played very important role consequently in agreeing the ideas of MJP Chief Engineer for automating the pump ON-OFF system using GSM, putting the whole distribution system on GIS map, making the rate contract for the AMR meters, with same manufacturer so as to have a similarity, installing the pressure sensor to calibrate hydraulic model, computerized billing etc.

### **Benefits resulting from the project**

The project has not only succeeded in giving benefits to the Malkapur citizens in the below listed aspects but has also provided the state and nation, a success story on 24x7 water supply for whole of the town (unlike the other towns where some wards are 24X7) for the first time in India which can be seen and replicated by other Municipal Councils.

#### **1) Improvement in delivery time and services**

Pre-Project, the town Malkapur used to depend on bore wells, tankers and meager water supply through earlier piped water supply system which was only for old Gaothan. The timings of the services were unpredictable and the people had to rush for water at any time when it was made available, which included late night hours as well. This used to disturb the time management of the citizens. Now the water is available to the taps any time it is opened 24 x 7. This has totally



removed the constraints of attending to irregular water services and thus the citizens have been freed of any special time to be allocated for water supply.

The beneficiary feedback is video captured and all the citizens of Malkapur are very happy and feel proud of their system which is the only one in India where the whole town is provided with 24 x 7 water supply. The feedback also specifies the time saved by them and the wastage of water stopped due to throwing away the water filled earlier day. The ladies are especially very much happy that they do not have to fetch the water from long distance and they can get water whenever they want by just opening the tap.

## **2) Quality of Water**

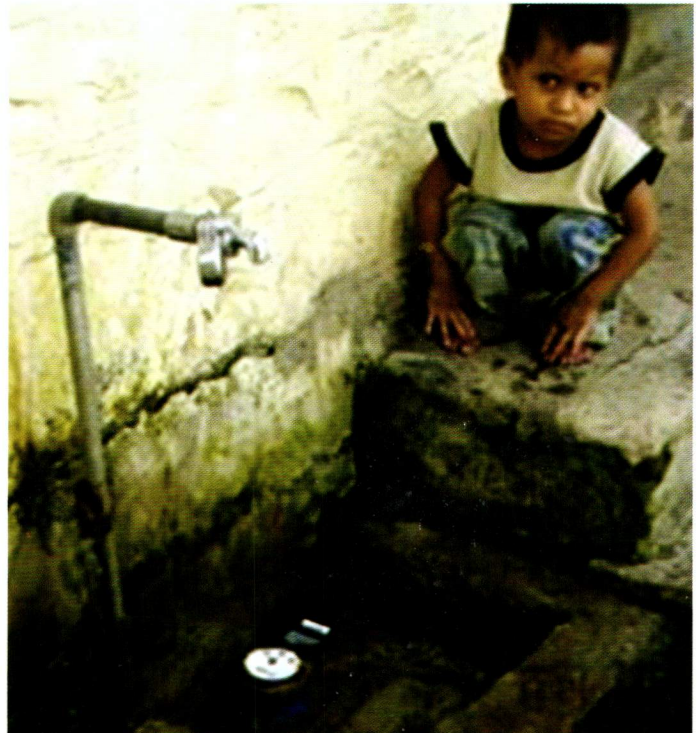
The quality of water as delivered to the citizens through the tap is now guaranteed as the pipes are pressurized throughout day and night 24 x 7. This does not allow outside dirt to enter in the pipes. People are happy to get assured good quality water as they open the tap. The 'Krishna Medical College, Karad' carried out a study on the quality of water after commissioning of the 24 x 7 system and they have reported that 100% of the samples are potable and free from contamination.

## **3) Decrease in water borne illnesses in children**

The survey carried out by Anganwadi Sevika indicated that the water borne diseases in the children have reduced remarkably to near zero level.

## **4) Reduction in wastage of water**

Wasteful use of water is remarkably reduced and the reduction is to the extent of 30%. The demand management by making the people aware of the system and the telescopic tariff structure made this possible. In the initial period when some zones were working 24 x 7 while others were intermittent and therefore flat tariff was retained, led to 19-20 hours of pumping in the system. Consequent to demand management exercise by mass awareness and implementation of telescopic tariff reduced the pumping requirement to 13-14 hours when all the zones are now getting 24 x 7 water supply.





## **5) Shifting control of the distribution system from Valve man to the Consumer**

When the supply was meager, and many valves were to be operated for giving water to the people at different time of day and night, "Valve man" used to be key person dictating the water supply. Now no valves are required to be operated in the distribution network and the consumer is the "King" and can open tap and get the water at any time of the day or night. Thus 22 Valve man and their misconduct is now a part of history.

## **6) Simplification of billing procedure**

The AMR type water meters installed, can be read remotely by driving through the streets using hand held device & radio frequency and hence the meter reading procedure is simplified. There is no problem even if the door is locked, and of average reading. The data is free from the errors of manual handling. The readings can be downloaded from the handheld i-paq (A hand held device) to the computer and bills can be generated immediately. Thus the earlier annual billing procedure is now monthly billing and thus the cash flow of the Municipal Council is improved. So also for consumer paying a large sum at the end of year used to find it difficult than small sum every month now.

## **7) Saving in Electricity & helping clean development initiatives**

Prior to the project, households and people living in 2 / 3 storey buildings used to pump the water from ground floor to the tanks on terrace, some of them also used to operate power pumps on bore wells, the M.C. also used to operate 11 Nos. of power pumps on bore wells for supplying water to the respective areas. All this is now stopped, as the water is available 24 x 7 with a pressure that can fill the terrace tank on the 3rd floor without pumping. This has saved electricity to the tune of 330336 KWH / year. This is as per the actual electricity billing data pre and post project. This exercise was carried out for submitting the proposal for 'Energy Conservation Award' to MEDA. The energy saved is equivalent to reduction in 450 tons of carbon dioxide in the atmosphere.

## **8) Increased prestige & pride for Citizens leading to increase in revenue recovery**

The ideal service made available has increased the prestige of people and they are now experiencing pride that their town is owner of such a good system. At the same time the revenue recovery in the water is improved from 60% earlier to 80% and is improving day by day.

## **9) Reduction in operation cost**

The simple system automation like operating the raw water pumps from water treatment plant using GSM technology has reduced the cost of operation as the raw water pumping station is now operated un-manned. This has eliminated the requirement of 2 pump operators there.



## 10) A successful pilot

It has achieved its aim as a pilot project. Many Municipal Councils, MLAs and others aspiring to implement 24 x 7 water supply system are visiting the town and understanding the methodology. The Vice President of the Municipal Council along with the Chief Engineer of MJP and field engineers of MJP are delivering lectures jointly to the aspiring municipalities / technocrats and giving them an insight how and where to implement 24 x 7 system and the role of technocrats, beneficiary people and people's representative as a homogeneous team in achieving the success.

## 11) Reduction in NRW

The system is provided with AMR type bulk meters to all the zones and all the consumers in the zone. Hence it is possible to take all the readings by driving in the town within ½ an hour and thus using these snap reading of the meters it is possible to have day to day water audit in the system. The measured NRW in the system is between 8-12%, which is far less than the 25-40% commonly found in most of the towns in India.

**The impact, as discussed in the above paras, is summarized below table.**

Sr.No.	Result Area	Pre Project	Post Project
01	Timeliness of service delivery.	No definite time. Water supply 2-3 days alternate.	Water supply available 24 hrs. a day 7 days a week to the citizens.
02	Water Quality	Water quality could not be guaranteed.	Guaranteed water quality with 100% samples potable.
03	Time management of consumer	Wastage of time of consumer.	Consumer can utilize his time as per their will since water is available 24 x 7.
04	Saving in water	After 24x7 but before charging on metered basis, the water was required to be pumped for 19-20 hrs. People used to overuse & waste large quantity of water and the flow from gutters used to be high which was getting into one of the private land making it like a pool of waste water.	Post 24x7 complete commissioning with demand management efforts water to the extent of 30% is conserved. Now 13-14 hrs. pumping is sufficient to keep 24 x 7 operational. Now the land where the pool was; has become dry.



Sr.No.	Result Area	Pre Project	Post Project
05	Reduction in electricity consumption	11 bore wells with power pumps of M.C. and many power pumps, small pumps for lifting water from ground to terrace was working.	Now these pumps are totally stopped with reduction in electricity consumption by 27528 KWH per month.
06	Reduction in cost of operation.	I) For operating pumps at head works separate operators were required.	I) With automation using GSM technology pumps are operated from WTP & the Head works is un-manned. Reduction in cost by Rs. 9000 per month
		ii) 22 valve men used to operate the valves in distribution network & the bore well valves so as to provide water to the consumer at different times of day and night by zoning method.	ii) There is no need of valve man as the water is available 24 x 7 throughout the town and no valves are to be operated. Reduction in cost by Rs. 66000 per month
			Valve actuators have been installed near service reservoirs which are fed by gravity through MBR. When water level in the tank reaches full tank level, the water supply through gravity main is cut off and when it is empty water supply is restarted. This maintains water supply 24x7 available in distribution network.
			Electronic Pressure sensors have been installed in MBR to control the water levels. As soon as the water levels in the tanks get reduced to the level of 30 % of total height, the pumps installed in pure water pump are started automatically. As soon as water reaches to full capacity of tank, the pumping is stopped. Because of this the water supply in the distribution system is maintained 24x7.



Sr.No.	Result Area	Pre Project	Post Project
		<p>iii) Ordinary meters would have required 3 meter readers to collect the meter readings.</p> <p>Leakage level in India varies from 25-40%</p>	<p>iii) Due to use of AMR no meter reader is required. The data handling error are also not there.</p> <p>Measured leakage level in Malkapur is 8-12%</p> <p>As per the sanctioned scheme, it was proposed to install 2950 water connections with AMR water meters. The same were executed at cost Rs. 6560/- per no. and the expenditure was done through Govt grant. After commissioning of the scheme, new consumers were given water connections including AMR water meter at Rs. 14600/- per no.. The rate included the cost of AMR meter, ferrule, MDPE pipe, brick chamber. The complete rate as above includes the cost of AMR meter at Rs. 9300/-, the 50% of which is borne by Malkapur Nagar Panchayat &amp; 50% by consumers. The above rate of Rs.14600/- is fixed by Malkapur Nagar Panchayat by inviting annual rate contract.</p>
07	System leakage level		<p>20 no of pressure sensors are installed at various node points on distribution system, which record loss in the pressure, due to leakages. This control is done by GSM network system with remote wireless operation, with the help of computer installed @ WTP.</p>
08	Recovery of water tariff	60% recovery	<p>Now 94% recovery and still improving targeted to be 100%.</p>



## Status of Domestic water connections

Year 2008	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014 (upto 8/2014)
2650	3033	3539	4037	5129	5756	5997

Year	Expenditure	Demand	Recovery	% of Recovery
Year 2008-09	48.00	22.65	17.00	75.05
Year 2009-10	50.81	60.78	56.57	93.07
Year 2010-11	57.49	60.37	57.88	95.87
Year 2011-12	51.34	78.58	75.34	95.88
Year 2012-13	62.78	95.83	90.21	94.13
Year 2013-14	85.99	103.10	97.35	94.42

### Scope of sustainability

The initiative is sustainable both physically and financially. The water availability in the source "River Koyna" is sufficient for all 365 days of year and years together for the small quantity required by this town. As per the historical data and as per the water release schedule of Koyna Dam which is one of the major dams in the high rainfall zone of Sahyadris there will be no constraint in availability of water. The system capacity is also sufficient to take care of fluctuation in demand for another 10-15 years. The present requirement can be met by 12-13 hrs pumping. Thus water resource and system capacity point of view the initiative is sustainable. Financially the initiative is sustainable as the operation cost and the revenue are closely matching and the Municipal Council has decided to increase the rates every year and to keep the sustainable rate. In fact they have constituted a committee of ruling party, opposition party, experts and those who were opposing the initiative or requesting for lower rates. The committee is given task to propose the rates in such a manner that there will be no loss in operating the system. The recovery levels are also increasing. 60% of the connection holders have tried successfully to keep their consumption within limit so that the water is affordable to them. Some of the big houses who have rented their premises to many families have now started charging them for water in addition to rent just like electricity bills. Thus the consumption that is charged in higher slab for such houses rented to many families is offloaded to the hirers of the premises. All these minutest planning and convincing the Municipal Council by the nominee and positive orientation of Municipal Council has made the initiative physically and financially sustainable.



## Replicability

The initiative is replicable where the availability of water is sufficient for all the 365 days of the year. It is replicable with the system capacity sufficient to cater for the increased demand by the people in the transition phase of complete town getting switched over to 24 x 7 and effective demand management is done through mass awareness and telescopic rate implementation. The smaller system capacities can not satisfy this increased transition stage requirement and the initiative gets nipped in bud. The peri-urban areas where the distribution net work is to be laid totally a fresh are the best areas where the system can be replicated successfully.

## AWARDS

This initiative got "Prime Ministers Award for Excellence in Public Administration" for the year 2009-10 on account of successful planning, designing & executing 24x7 Malkapur water supply scheme. This has also earned National Urban Award for year 2010.



National Urban Award for year 2010



Prime Ministers Excellence Award year 2009-2010





Use of recent modern technology is being incorporated successfully to run 24x7 Malkapur Water Supply Scheme and the scheme has tested to its 100% efficiency and satisfaction of the people. In future it is planned to pay water bills by adopting SMS systems on consumer mobile.

**The proper & effective combination of high political will power, successful Government Machinery & public contribution, has yielded excellent and successful 24x7 Water Supply Scheme, such as Malkapur & Malkapur only, which is a path finder & mile stone for all water supply schemes which are proposed to be executed in future.**



# Malkapur 24 X 7 Water Supply Scheme

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