



## Road Map towards 24x7 Water Supply in Class 'A' Municipal Councils in Maharashtra

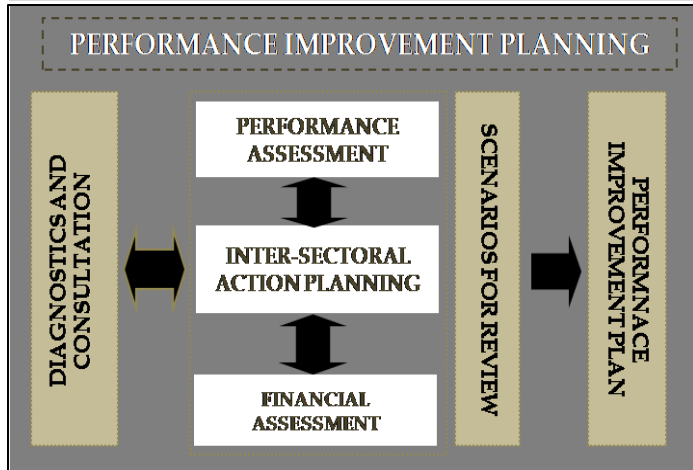
# Introduction

# Context

- Government of Maharashtra (GoM) in the workshops held with Chief Secretary, commissioners and chief officers of class 'A' municipal councils requested support of PAS Project in two key areas:
  - *For implementing 24x7 water supply system*
  - *Open Defecation Free (ODF) cities*
- The improvement areas were in line with the Government of India's Service Level Benchmarking (SLB) initiative and GoM's Maharashtra Sujal Nirmal Abhiyaan (MSNA) programme
- The PAS Project has, as suggested by GoM, provided support to all 15 class 'A' cities with the focus on two above mentioned areas
- The PIP exercise began in mid 2011. A performance improvement framework was developed as part of this exercise

# Performance Improvement Framework

Basic framework for performance improvement and tools for performance improvement has been developed for urban local governments focusing on citywide approaches



PAS Project

## Performance Assessment

*Performance indicators for each sector are the main basis for assessing actual service performance*



## Inter Sectoral Planning

*Actions include both traditional capital intensive infrastructure as well as other no/low cost actions such as policies and process changes*



## Financial Assessment

*Overall plan is developed through a rigorous financial feasibility assessment with respect to present Municipal finance status*

# PIP Activities for Class 'A' Cities of Maharashtra

## Data Collection and Verification

Data Collection through site visits and discussions with ULB officials

Initial ideas on PIP were discussed with the ULB staff



## Data Analysis and Action Planning

Data Analysis under guidance of sector experts and Municipal Officials

Focus on 24x7 and ODF

Identification of Key Improvement Areas, prioritisation of actions and financial assessment



## Cost Estimates in consultation with GoM, ULBs and Sector Experts

Cost estimates for all high and low-cost actions suggested through analysis

PIP Workshops for inputs from GoM

To explore funding options for undertaking improvement actions

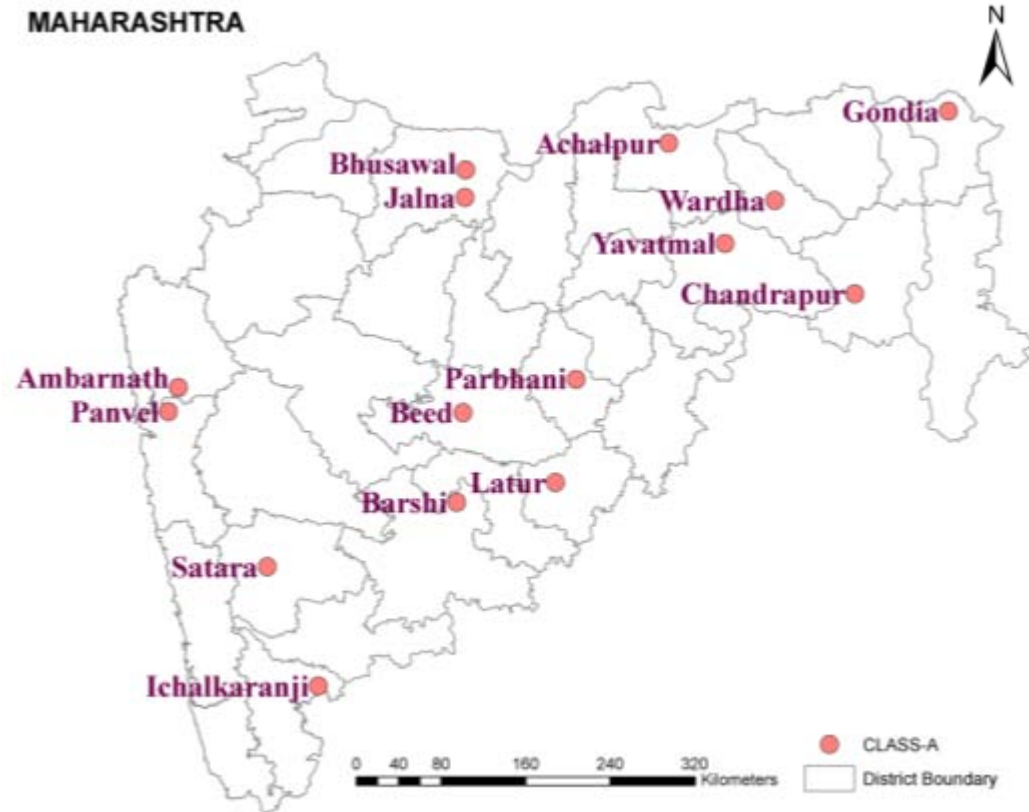


# Situation Assessment

*Class 'A' Cities of Maharashtra*

# Demography

City Name	Area (sq.km)	Population (2011)	Number of HHs (2011)
Latur	33.0	382,754	71,871
Chandrapur	56.3	321,036	73,035
Parbhani	57.6	307,191	56,067
Ichalkaranji	29.8	287,570	60,889
Jalna	81.9	285,349	53,126
Ambernath	38.0	254,003	54,948
Bhusawal	13.4	187,750	38,439
Beed	8.3	146,237	28,510
Gondia	18.1	132,889	27,787
Satara	8.2	120,079	27,056
Barshi	36.3	118,573	24,430
Yavatmal	10.2	116,714	25,670
Achalpur	16.0	112,293	21,689
Panvel	3.6	111,906	28,319
Wardha	7.4	105,543	23,532

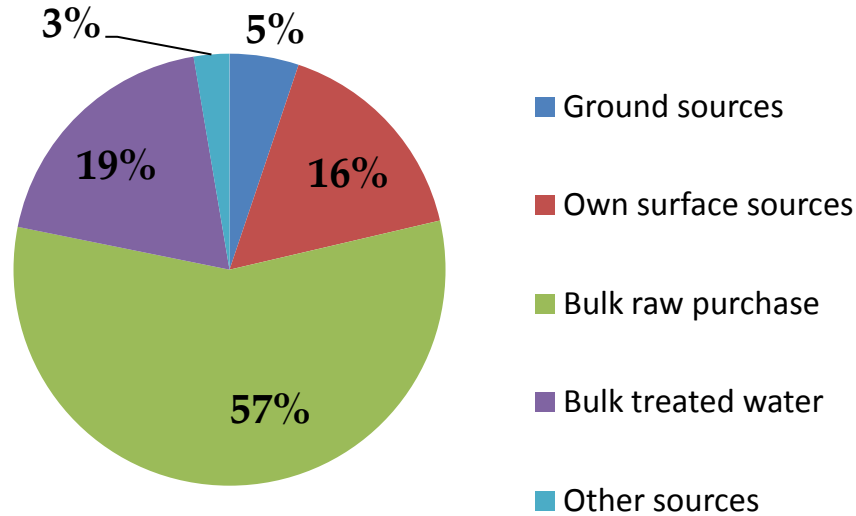


Source: PAS data 2010-11



# Water Supply Sources

Proportion of various water sources



- ❑ Major source of water supply is bulk purchase, which includes around 57% bulk raw water and 19% bulk treated water
- ❑ The dependency on groundwater sources is limited to only 5 % of the total water quantity
- ❑ Jalna pumps water from the farthest distance (130 kms) followed by Barshi and Latur that pump water from 65 and 60 km respectively.

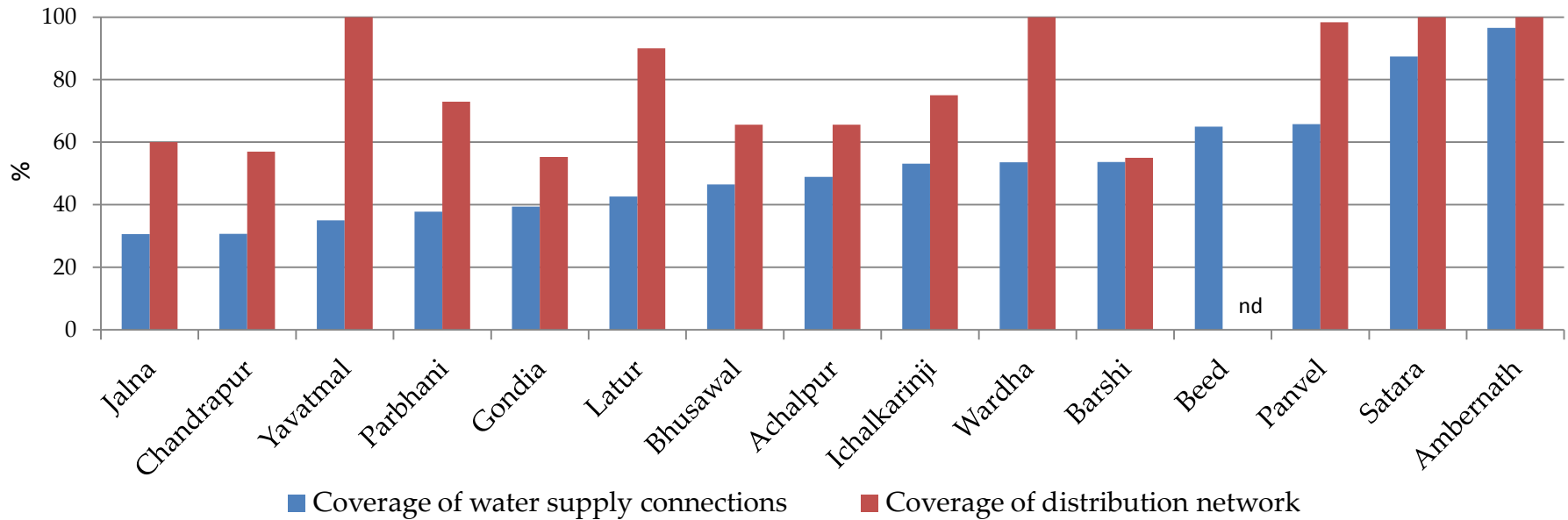
Cities	Approx. distance from farthest water source (km)
Jalna	130.0
Barshi	65.0
Latur	60.0
Yavatmal	25.0
Chandrapur	22.0
Ichalkarinji	18.0
Parbhani	17.0
Panvel	16.0
Gondia	16.0
Wardha	11.0
Satara	6.5
Ambernath	3.5
Bhusawal	1.5
Achalpur	Groundwater
Beed	nd

Source: PAS data 2010-11



# Water Supply Coverage

Coverage of water supply connections and distribution network

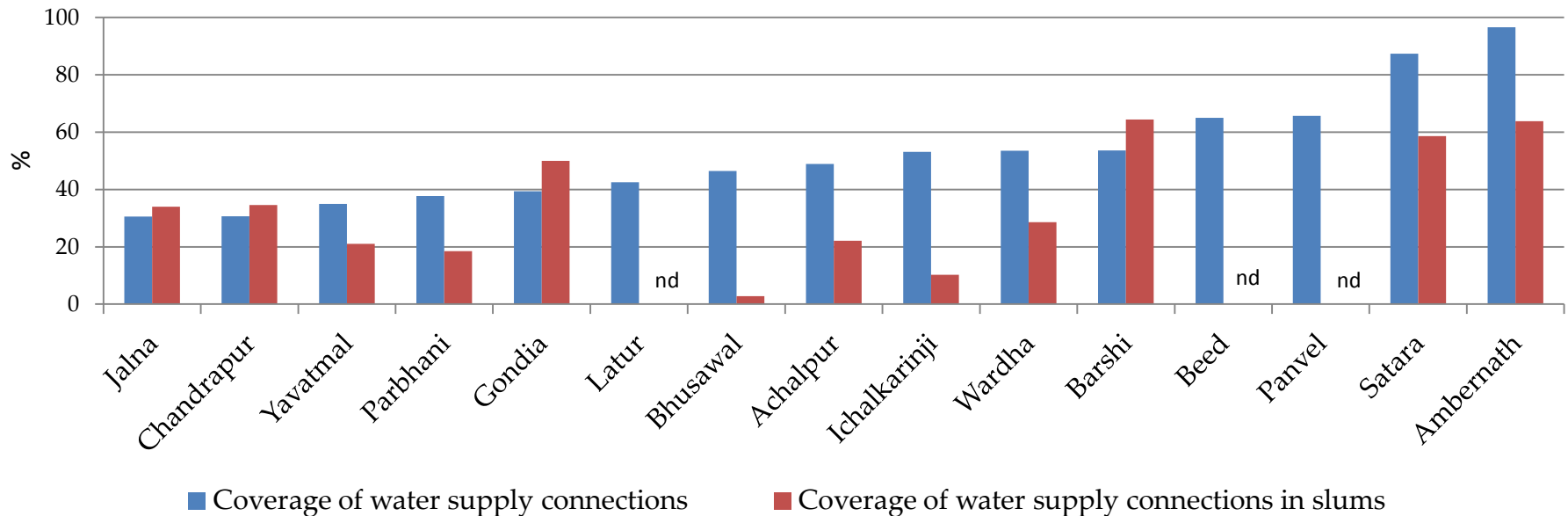


Source: PAS data 2010-11

- ❑ Apart from 3 cities, all the other cities have a gap of more than 10% between distribution network and HH level connections
- ❑ Ambernath has 100% area covered with distribution network and 97% HH level coverage
- ❑ Yavatmal, Latur, Wardha and Panvel have more than 80% area covered under distribution network but less than 60% HH level connections

# Water Supply Coverage

Coverage of water supply connections at city and slum level

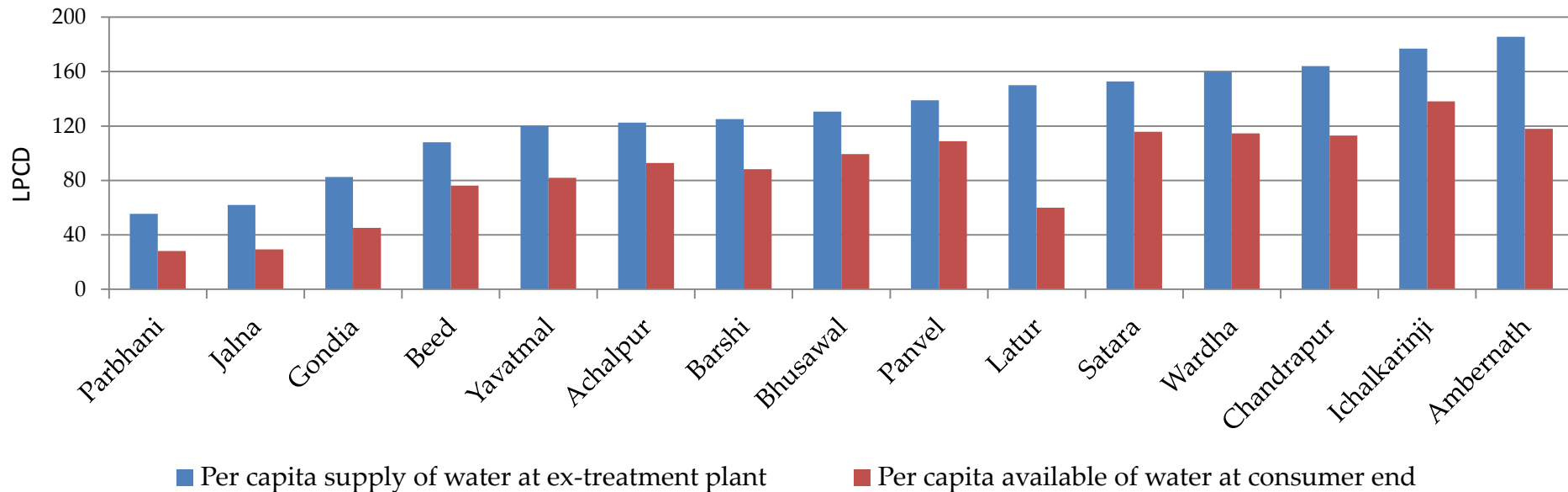


Source: PAS data 2010-11

- ❑ Apart from 4 cities, all the other cities have more than 15% gap between water supply connection in slums and at city level
- ❑ Jalna, Chandrapur, Gondia and Barshi have higher coverage of household connections at slum level than overall city level
- ❑ Bhusawal and Ichalkarinji have the highest gap between slum level coverage of water supply connections and overall city level coverage

# Quantity of Water Supply

Per capita supply of water at ex treatment plant and at consumer end



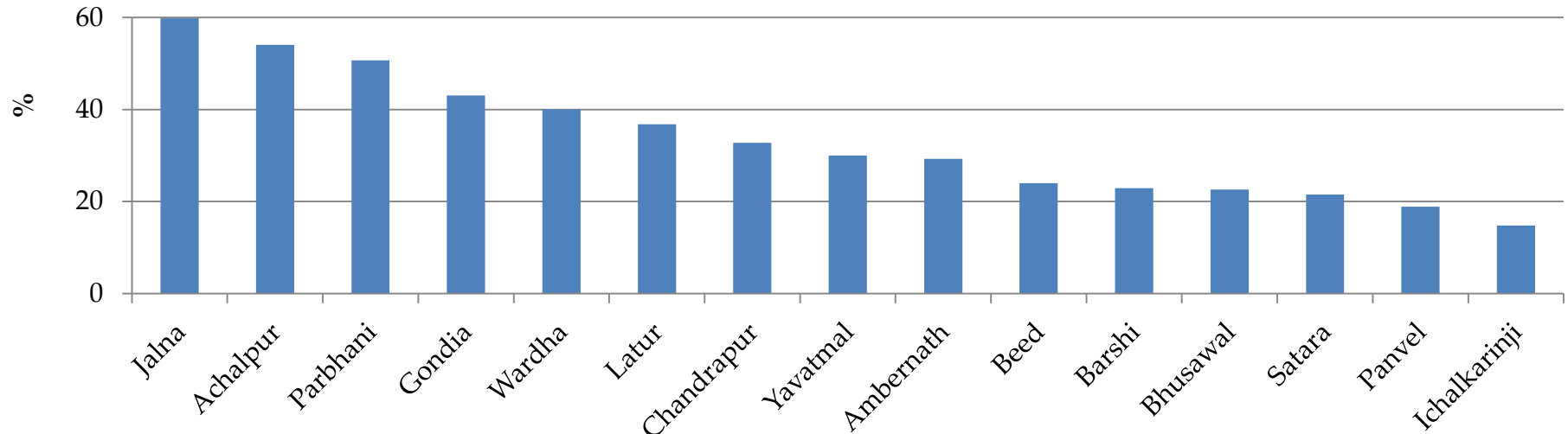
Source: PAS data 2010-11

- ❑ The quantity of water supply needs to be adequate to run a 24x7 water supply network and therefore, some cities need to increase water supply even to attempt 24x7 pilot project
- ❑ 6 cities report more than 100 lpcd at consumer end. Ichalkaranji has the highest supply at the consumer end at 138 lpcd. Parbhani and Jalna are the lowest in the group with less than 30 lpcd supply. Therefore these two cities will have to increase their water supply to even attempt 24x7 water supply system

# Extent of Non-Revenue Water

Source: PAS data 2010-11

## Extent of Non-Revenue Water (Estimated)



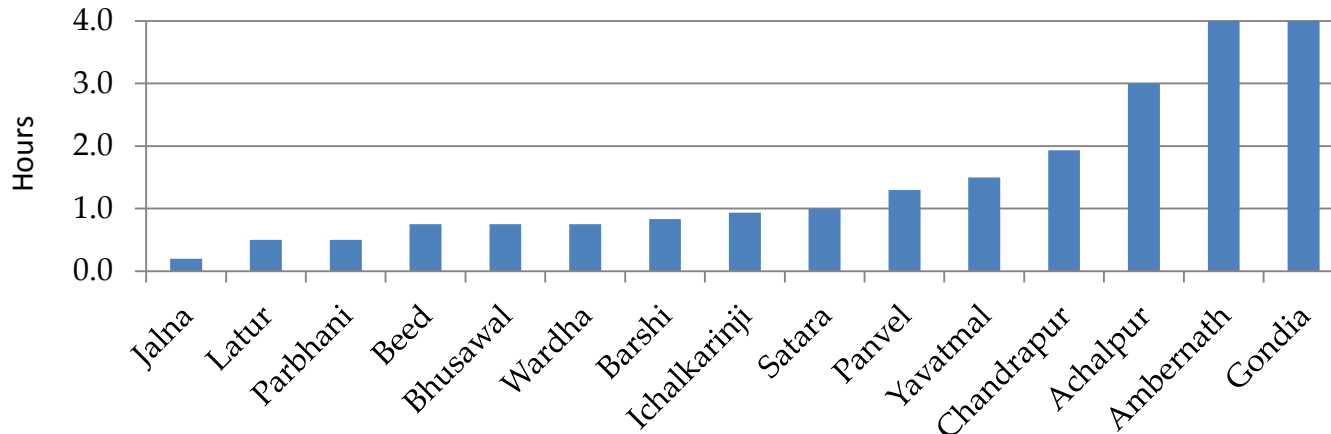
Source: PAS data 2010-11

- ❑ To ensure proper functioning of 24x7 water supply network, losses should be minimum and assessed in a reliable manner
- ❑ More than half of the cities have NRW values less than 25%. However, the reliability of these values is very low
- ❑ For all class 'A' cities, except for Panvel (B grade) and Ambernath (A grade), the NRW value for other cities is of grade D reliability due to absence of metering
- ❑ Only 7 cities report consumer water metering. The highest percentage of metering is in Achalpur, Gondia, Yavatmal and Ambernath



# Continuity of Water Supply

## Water supply hours

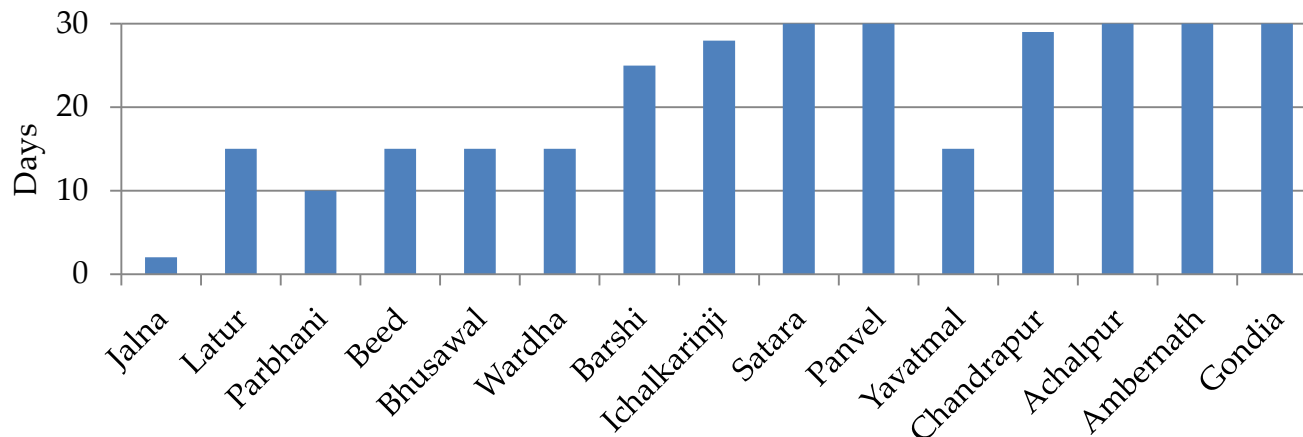


Only 6 cities (*Satara, Panvel, Chandrapur, Achalpur, Ambernath, Gondia*) report daily water supply. The average supply hours are between 1 to 4 hours per day

Among the remaining 9 cities, Yavatmal performs better as it supplies water on alternate days for 1.5 hours per day

Jalna represents the most extreme case with water being supplied only once in a fortnight

## Days of supply



# Shortcomings of Intermittent Supply

## Operation and Maintenance

- ❑ Valves suffer frequent wear and tear
- ❑ Varying pressure also lead to frequent failures in the water supply network
- ❑ Difficult to predict the actual behavior of water supply system
- ❑ Leads to contamination of water supply during non-supply hours

## Resource requirement

- ❑ Large size of pipe mains and storage tank is required
- ❑ Extra dose of chlorine or other disinfectants are required

## Scenario at consumer end

- ❑ Due to uncertainty of supply, consumers store a large quantity of water and waste it before collecting fresh water again
- ❑ Inconvenient supply hours affect poor people due to short of storage capacity

# Need for 24x7 Water Supply

Leads to

- Better service to consumer
  - Continuous water supply at desired pressure
  - Decreased contamination of water supply and improved health outcomes
- Reduction in water losses
- Improved accountability of system (input-supply-consumption)
- Sustainability of system (improved finances, optimised water supply and consumption)



# Moving towards 24x7 Water Supply System

## *Class 'A' Cities of Maharashtra*

# Case study for 24x7 Water Supply

- Malkapur Nagar Panchayat
  - ▣ 7,200 HHs
  - ▣ Entire city is covered under 24x7 water supply scheme
- Pilot zone in Kulgaon-Badlapur Municipal Council
  - ▣ 40,000 HHs
  - ▣ 8 out of 34 wards have 24x7 water supply, covering 30% of city population
- Pilot zones in Amravati Municipal Corporation
  - ▣ 1,35,000 HHs
  - ▣ 4 out of 16 zones have 24x7 water supply, covering 17% of city population

# Steps for 24x 7 Water Supply

## Developing reliable data on distribution network and customers

- ❑ Consumer survey
- ❑ GIS mapping

## Network restructuring

- ❑ Hydraulic modelling
- ❑ DMA demarcation and installation of bulk flow meters

## Control of leakages and energy optimisation

- ❑ Undertaking water audit, energy audit and leak detection survey

## Preparation and implementation of 24x7 water supply project

- ❑ DPR preparation for 24x7 water supply
- ❑ Selection and implementation of pilot zone for 24x7 waters supply
- ❑ Introduced metering and volumetric tariff
- ❑ Scaling up in the whole city

# Need for Reforms

- For efficient and effective operation of urban water supply services, improvements are essential
  
- The technical guidelines suggested by Ministry of Urban Development (MoUD), Government of India towards 24x7 systems provide an approach based on
  - Institutional improvements
  - Technical improvements
  - Commercial improvements

# Technical Shortcomings

- Summary of key technical shortcomings:
  - Reliable data on distribution networks and customers do not exist
  - There is virtually no metering of bulk water produced, transmitted or distributed at any point in the network
  - Pipelines within the distribution system are totally interlinked
  - Control of leakage on a routine, planned basis is impossible
  - It is unusual for a water utility to routinely measure or assess adequacy of system pressure and
  - Customer meters do not function with any predictable accuracy under intermittent supply conditions

# Commercial and Institutional Shortcomings

- Major commercial shortcomings are:
  - Lack of computerised billing and collection system with updated consumer records
  - Many cities have flat rate tariff
- Some of the technical aspects that will require improved managerial skills and automation are:
  - Establishing district metered areas (DMAs)
  - Preparation of appropriate hydraulic models and their application in planning, designing and operation
  - Pressure management
  - Installing and managing control devices for management of continuous supply

# Technical and Commercial Improvements

The technical and commercial constraints mentioned in the MoUD guidelines can be resolved through the implementation of GoM's reform programme of MSNA.

## Shortcomings

- ❑ Reliable data on distribution networks and customers does not exist
- ❑ There is virtually no metering of bulk water produced, transmitted or distributed at any point in the network
- ❑ Pipelines within the distribution system are totally interlinked
- ❑ Control of leakage on a routine, planned basis is impossible
- ❑ It is unusual for a water utility to routinely measure or assess adequacy of system pressure
- ❑ Lack of computerised billing and collection system with updated consumer records
- ❑ Many cities have flat rate tariff

## Improvement measures

- ❑ Consumer survey and GIS mapping of network
- ❑ Hydraulic modelling and creation of DMAs
- ❑ Water audit, leak detection survey and energy audit
- ❑ Computerised water billing and collection system
- ❑ Consumer end metering and introduced volumetric tariff



# Status of Implementation of Water Supply Reforms

Cities	Reduce NRW and increase water supply hours			Metering		Cost recovery
	Consumer survey	Water audit/leak detection and energy audit	GIS mapping and hydraulic modelling	DMA demarcation installation of bulk flow meters	Introduce metering and volumetric tariff	Computerised water billing and collection system
Ambernath						
Gondia						
Satara						
Yavatmal						
Latur						
Chandrapur						
Barshi						
Beed						
Parbhani						
Achalpur						
Bhusawal						
Ichalkaranji						
Jalna						
Panvel						
Wardha						

	<i>Projects in progress</i>		<i>Sanctioned projects</i>		<i>No existing projects</i>
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# Proposed Phase-wise Plan for 24x7

*Class 'A' Cities of Maharashtra*

# Approach to Implement 24x7 Water Supply



Based on diagnostic assessment of 15 class 'A' cities, the cities are divided in 3 groups. City selection parameters for proposing 24x7 water supply:

- Existing performance of service delivery
  - Source availability
  - Network coverage and connections
  - Existing leakages and losses
- Preparedness/implementation of sector reforms
  - Consumer survey
  - Water and energy audit
  - GIS and hydraulic modelling
  - Demarcation of DMAs and installation of bulk flow meters
- Proposed/sanctioned projects
  - Source augmentation
  - Replacement/extension of distribution network

# Approach to Implement 24x7 Water Supply

## Group 1 cities

- Ambernath, Gondia, Satara, Yavatmal
- Cities have already started implementing reforms related to water supply and detailed project reports (DPRs) for continuous water supply have been completed in three out of four cities

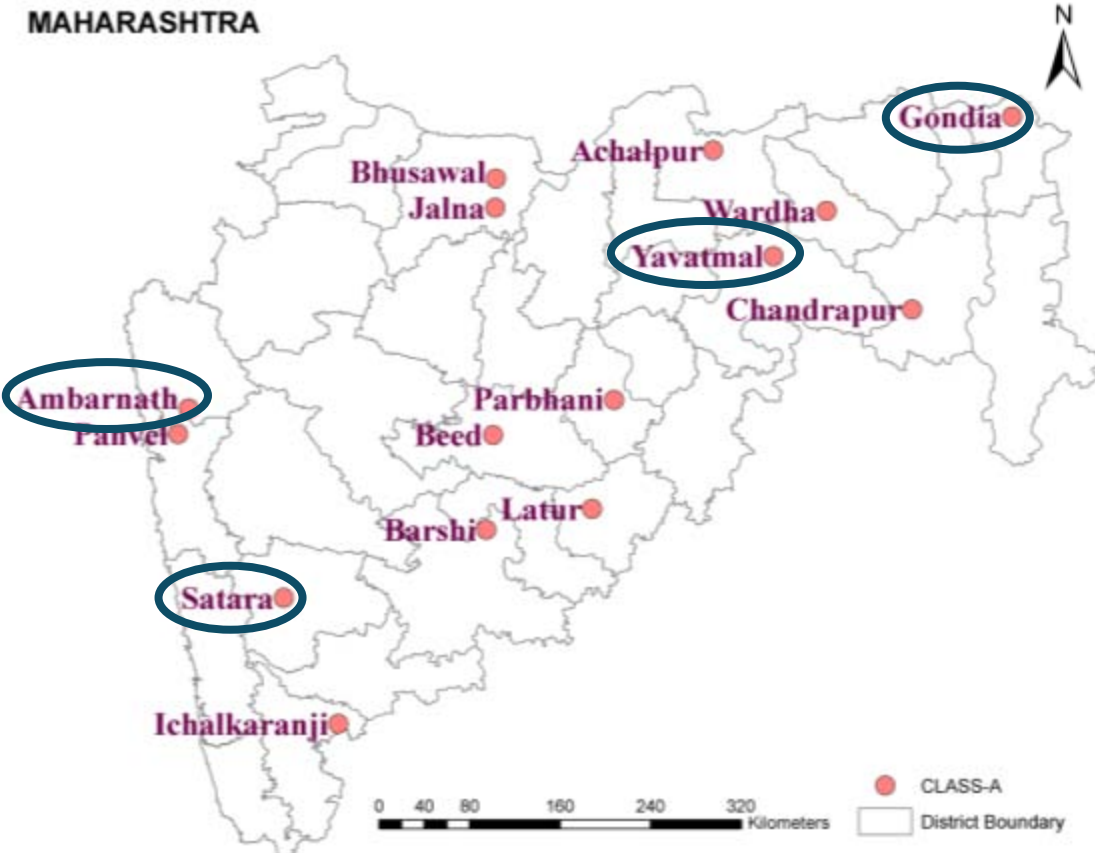
## Group 2 cities

- Achalpur, Barshi, Beed, Bhusawal, Ichalkaranji, Panvel, Wardha
- For few components of water reforms proposed in Barshi, Beed and Chandrapur. Rest of the cities need to initiate reforms as first step towards 24x7

## Group 3 cities

- Jalna, Latur and Parbhani
- Jalna and Parbhani have to assure water source before initiating 24x7. Augmentation of distribution network is going on in Latur
- After completion of source and distribution network augmentation, MSNA reforms should be initiated for further improvement

# Costing for 24x7 Water Supply



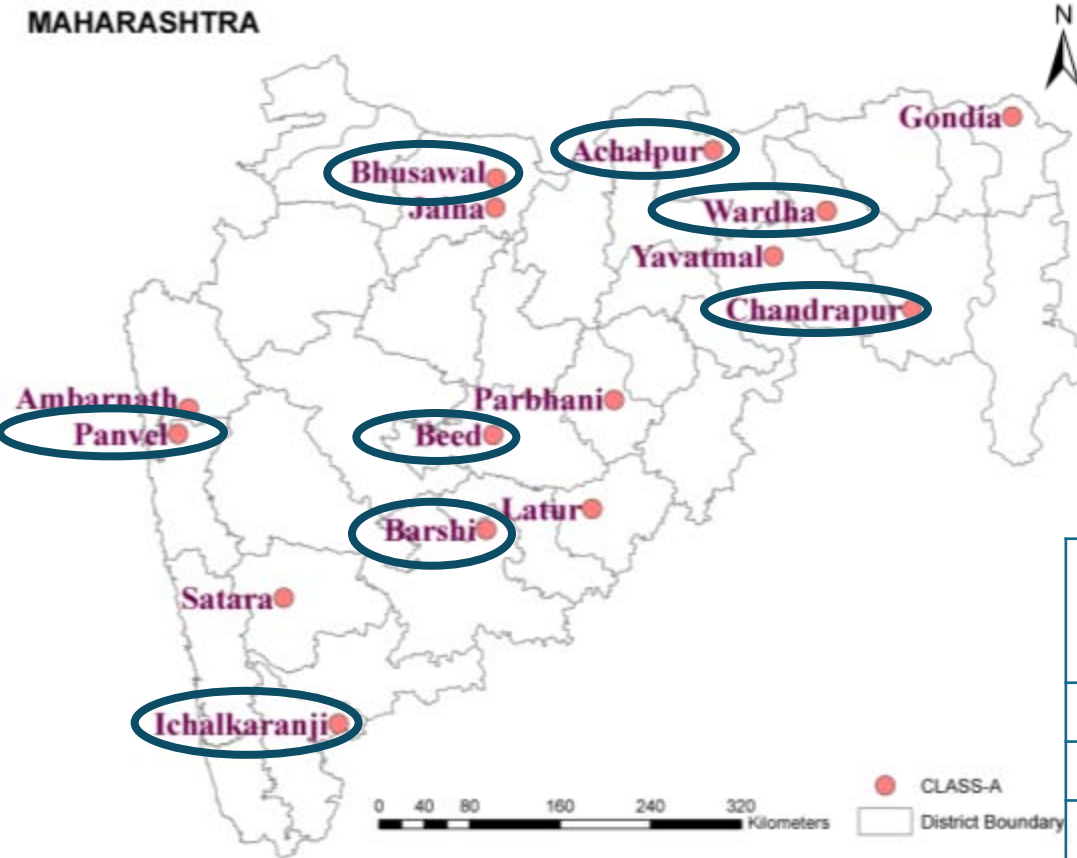
## Group 1 cities

- Ambarnath, Gondia have already prepared DPR for 24x7 water supply
- Yavatmal has prepared draft DPR
- Satara's cost is estimated in consultation with municipal officials
- Except Ambarnath, all cities in this group are covered under UIDSSMT

Cities	Cost for 24x7 Water Supply
Ambarnath	77.0
Gondiya	61.0
Satara	119.5
Yavatmal	40.2

Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project

# Costing for 24x7 Water Supply



## Group 2 cities

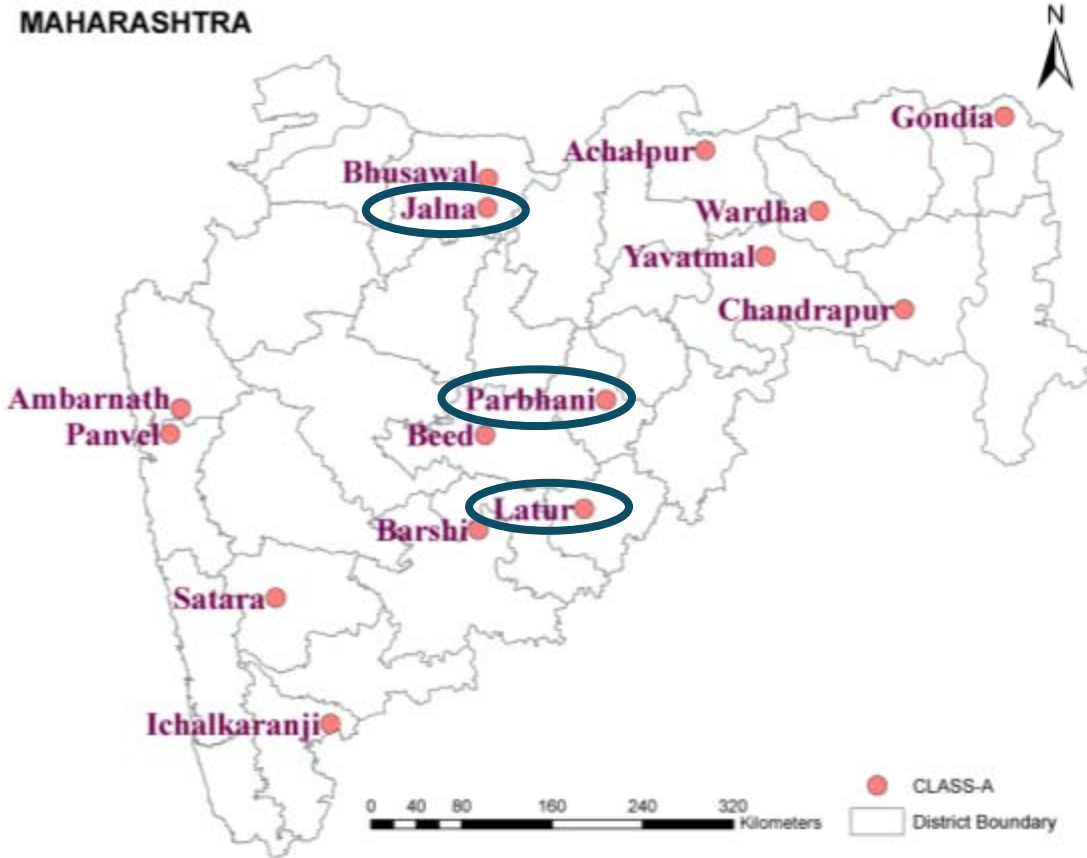
- ❑ Costs for undertaking energy and water audits have been sanctioned under MSNA in Barshi and Beed
- ❑ Cost have been estimated in consultation with municipal officials

Cities	Reform cost	Cost for 24x7 Water Supply	Total cost
Achalpur	3.5	33.9	37.4
Barshi	0.0	26.3	26.3
Beed	1.6	18.1	19.7
Bhusawal	1.1	93.2	94.3
Chandrapur	4.9	149.1	154
Ichalkaranji	5.0	24.9	29.9
Panvel	1.5	23.6	25.1
Wardha	0.8	38.5	39.3

Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project

# Costing for 24x7 Water Supply

MAHARASHTRA



## Group 3 cities

- ❑ In Jalna and Parbhani, source augmentation work is going on and in Latur, augmentation of distribution network is being undertaken
- ❑ After completion of augmentation work, cities will carry out reform work and assess the improvement of water supply scheme

❑ The cities will then implement 24x7 water supply project

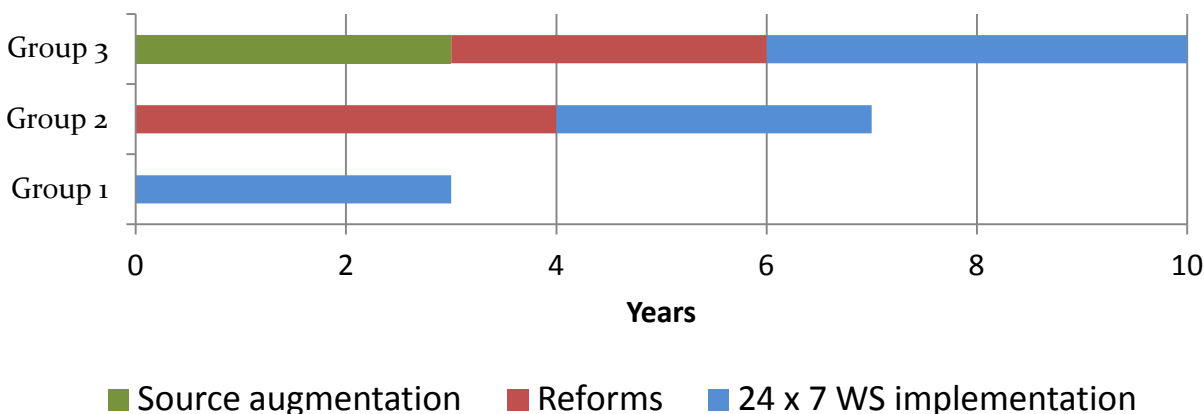
Cities	Augmentation cost	Reform cost	Cost for 24x7 Water Supply	Total cost
Jalna	145.0	1.6	103.9	250.5
Latur	14.1	1.66	110.5	126.2
Parbhani	140.0	1.4	183.2	324.6

Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project



# Phasing and Funding

## Phase wise Implementation Timescale



## Possible sources of funding:

- ❑ Source augmentation work is already funded under UIDSSMT
- ❑ The low-cost reform measures can be funded under MSNA. (Over the past six years, a total of Rs. 448.6 crore has been spent and Rs. 213 crore has been allocated for the FY 2011-12 by the State as part of the MSNA reforms implementation)
- ❑ Implementation of 24x7 water supply can be funded under Maharashtra Swarna Jayanti Nagarothan Maha Abhiyan (MSJNMA)(in 2 years, Rs. 88 crore has been spent). Potential source of funding can be through a new JNNURM, which is expected to focus on small and medium town

## Total Cost for 24x7 Water Supply (in Rs. in crores)

	24x7 water supply (Actual implementation costs)	Reform Measures	Source augmentation costs
Group 1	298		
Group 2	461	18	
Group 3	398	5	299
Total	1157	23	299

Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project

# Way Forward

- To implement and operate a successful 24x7 water supply system, sound water management practices, governance, policy and tremendous political will are required
- There are various models like public private partnership; hybrid model of government, city and civil society etc. *(Source: Achieving 24x7 water and water loss management in intermittent supply environment, IWA Water Wiki)*
- Cities can adopt appropriate model to implement and operate 24x7 water supply system

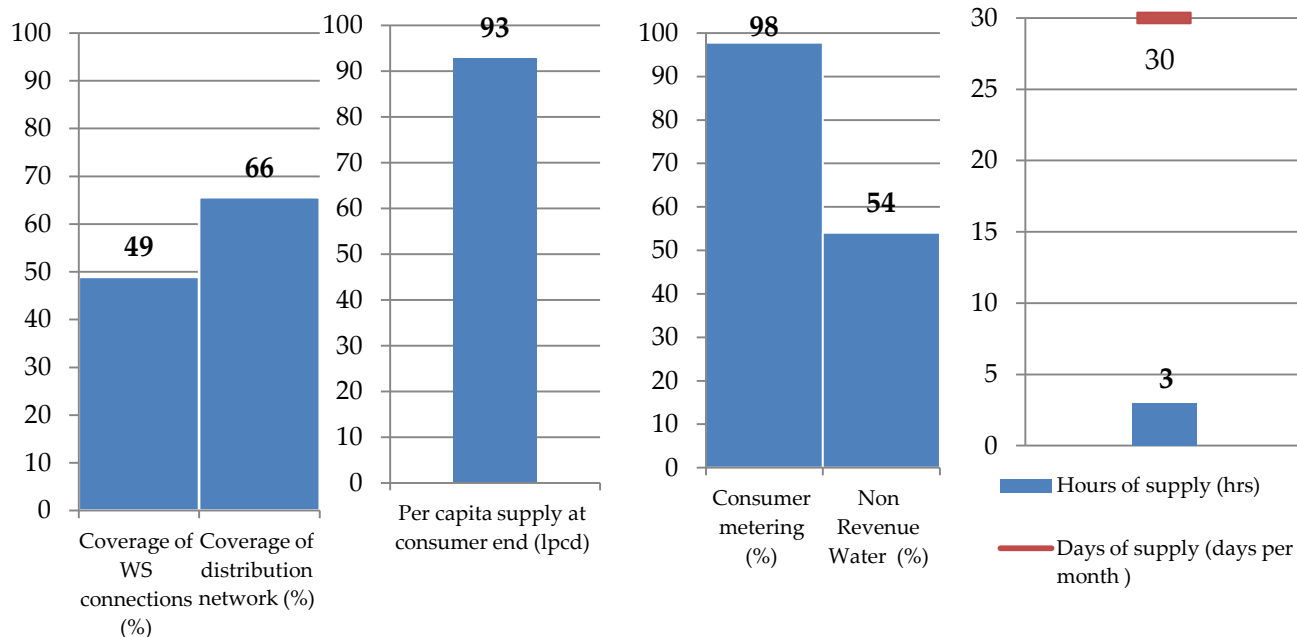
# Annexures

# Achalpur: Existing Situation

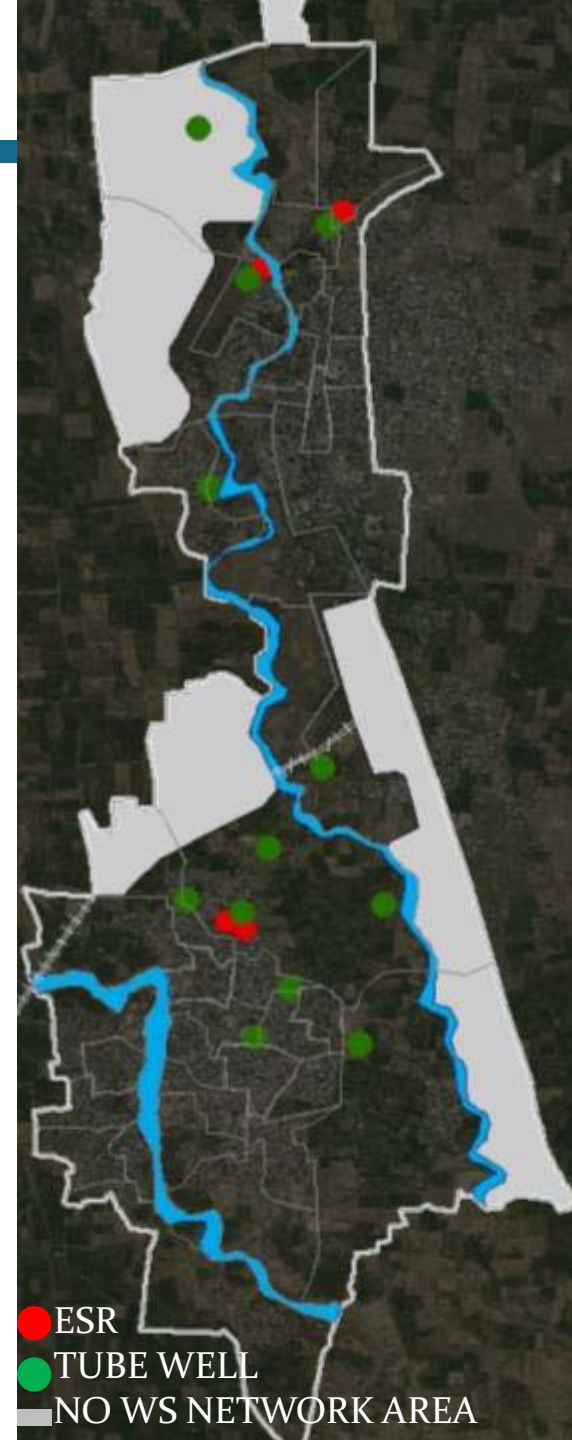
## Background Information

- Area (sq. km): 16.04
- Population: 1,12,293
- Slum population: 53.7% of total population
- Number of slums: 27 notified and 5 non-notified
- Number of wards: 38

## Performance of Water Supply System



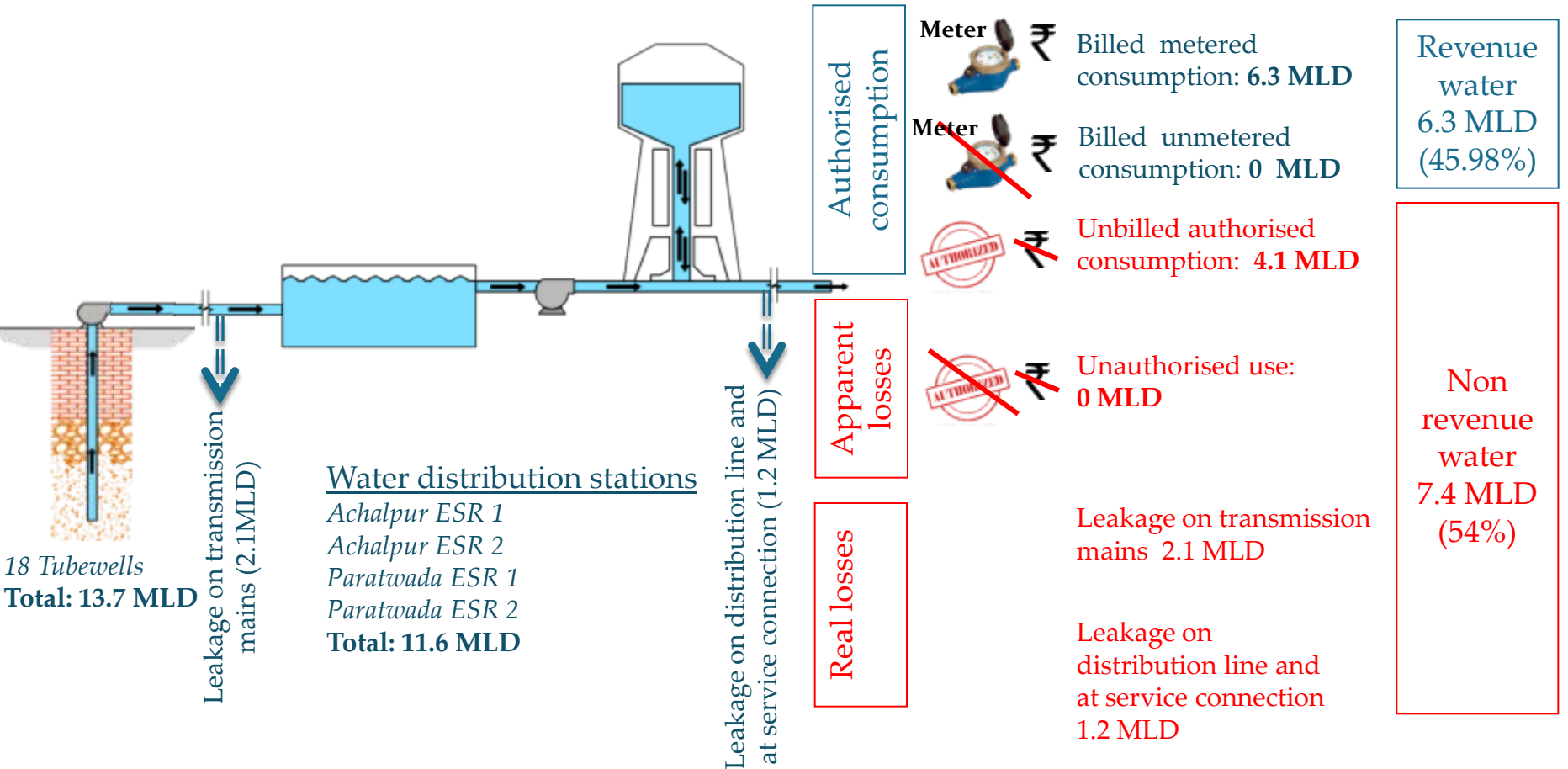
Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project



# Schematic Diagram of Water Supply System: Achalpur

System input volume:  
13.7 MLD

Revenue water:  
6.3 MLD



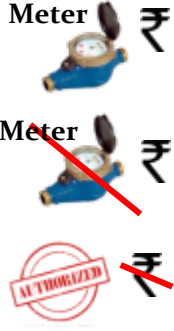
18 Tubewells  
Total: 13.7 MLD

Leakage on transmission mains (2.1MLD)

Water distribution stations  
Achalpur ESR 1  
Achalpur ESR 2  
Paratwada ESR 1  
Paratwada ESR 2  
Total: 11.6 MLD

Leakage on distribution line and at service connection (1.2 MLD)

Authorised consumption



Billed metered consumption: 6.3 MLD  
Billed unmetered consumption: 0 MLD  
Unbilled authorised consumption: 4.1 MLD

Apparent losses



Unauthorised use: 0 MLD

Real losses

Leakage on transmission mains 2.1 MLD  
Leakage on distribution line and at service connection 1.2 MLD

Revenue water  
6.3 MLD  
(45.98%)

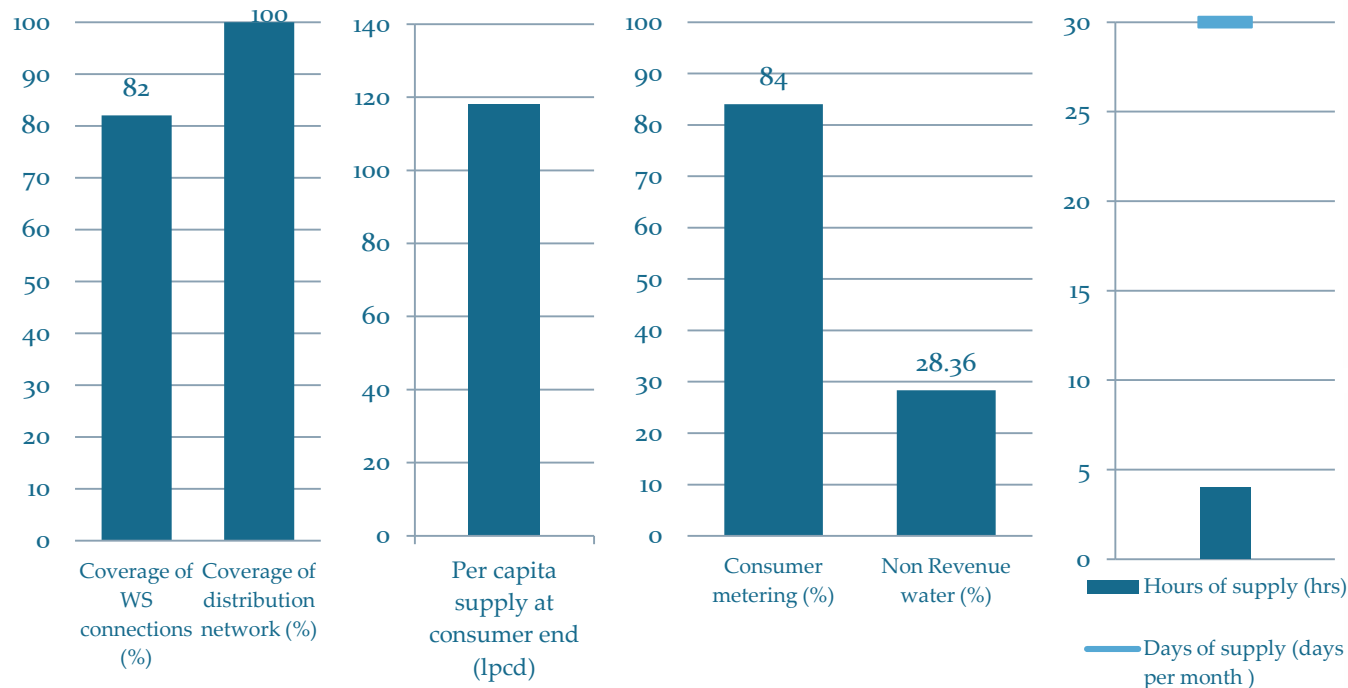
Non revenue water  
7.4 MLD  
(54%)

# Ambernath: Existing Situation

## Background Information

- Area (sq. km): 38
- Population: 2,59,023
- Slum population: 57% of total population
- Number of slums: 52
- Number of wards: 50

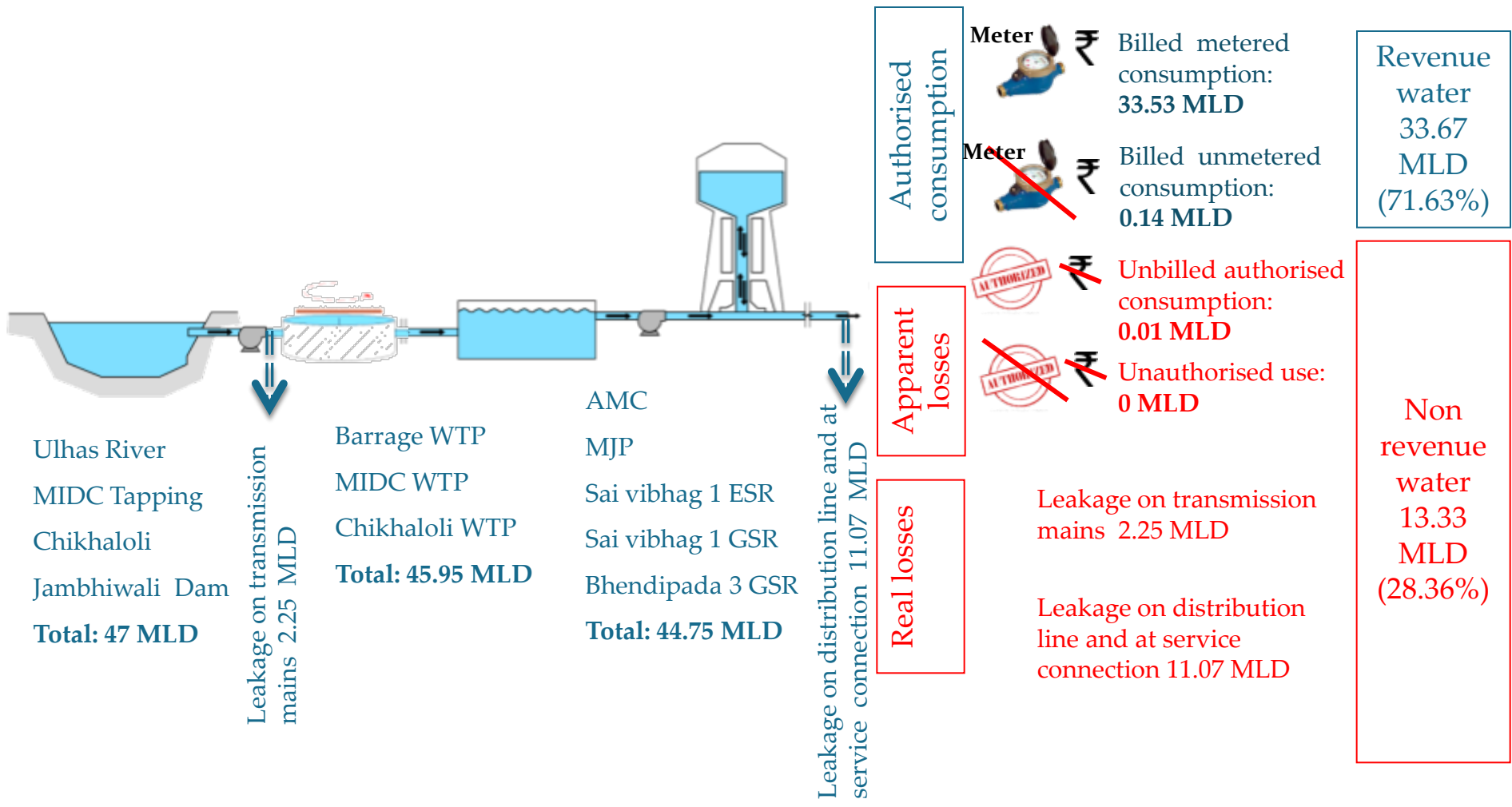
## Performance of Water Supply System



# Schematic Diagram of Water Supply System: Ambernath

System input volume:  
47 MLD

Revenue water:  
33.67 MLD



Ulhas River  
MIDC Tapping  
Chikhaloli  
Jambhiwali Dam  
**Total: 47 MLD**

Leakage on transmission mains 2.25 MLD

Barrage WTP  
MIDC WTP  
Chikhaloli WTP  
**Total: 45.95 MLD**

AMC  
MJP  
Sai vibhag 1 ESR  
Sai vibhag 1 GSR  
Bhendipada 3 GSR  
**Total: 44.75 MLD**

Leakage on distribution line and at service connection 11.07 MLD

Authorized consumption

Apparent losses

Real losses

Meter ₹ Billed metered consumption: 33.53 MLD  
Meter ₹ Billed unmetered consumption: 0.14 MLD  
~~Authorized~~ ₹ Unbilled authorised consumption: 0.01 MLD  
~~Authorized~~ ₹ Unauthorised use: 0 MLD

Leakage on transmission mains 2.25 MLD  
Leakage on distribution line and at service connection 11.07 MLD

Revenue water 33.67 MLD (71.63%)

Non revenue water 13.33 MLD (28.36%)

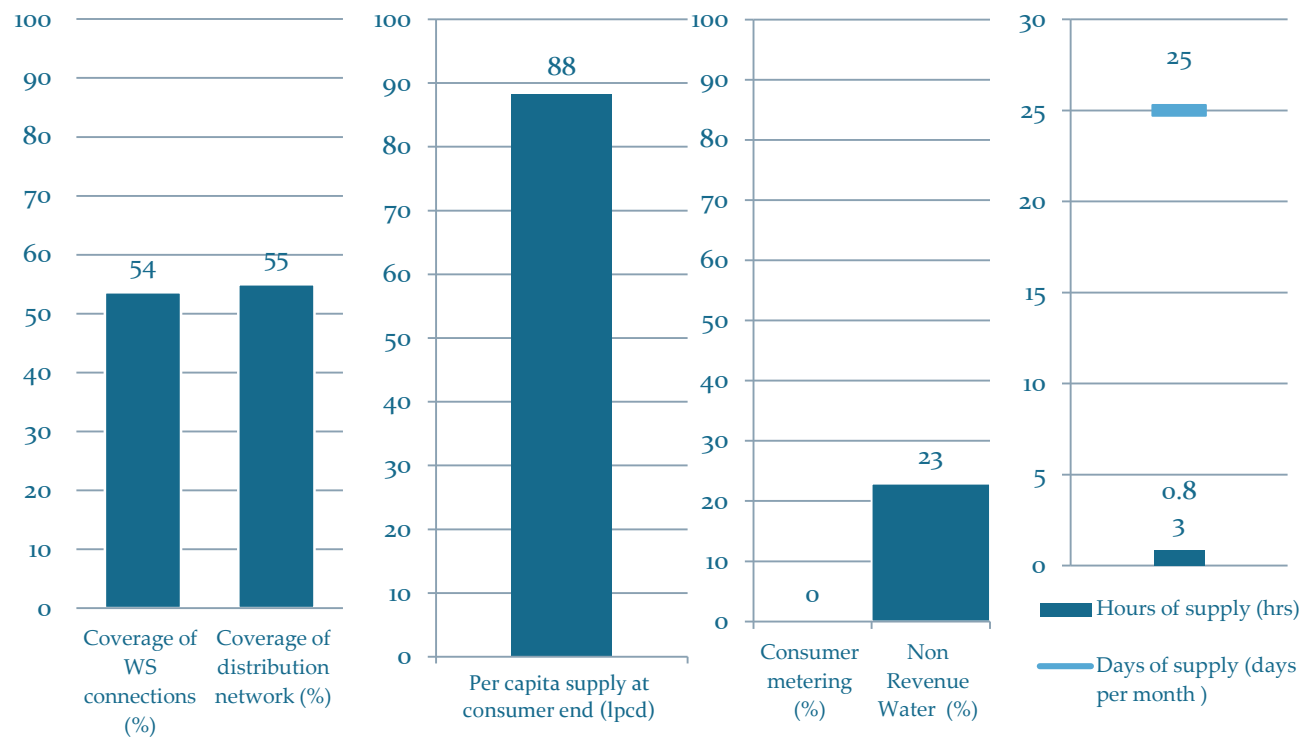


# Barshi: Existing Situation

## Background Information

- Area (sq. km): 36.26
- Population: 1,18,475
- Slum population: 41.02% of total population
- Number of slums: 32
- Number of wards: 38

## Performance of Water Supply System



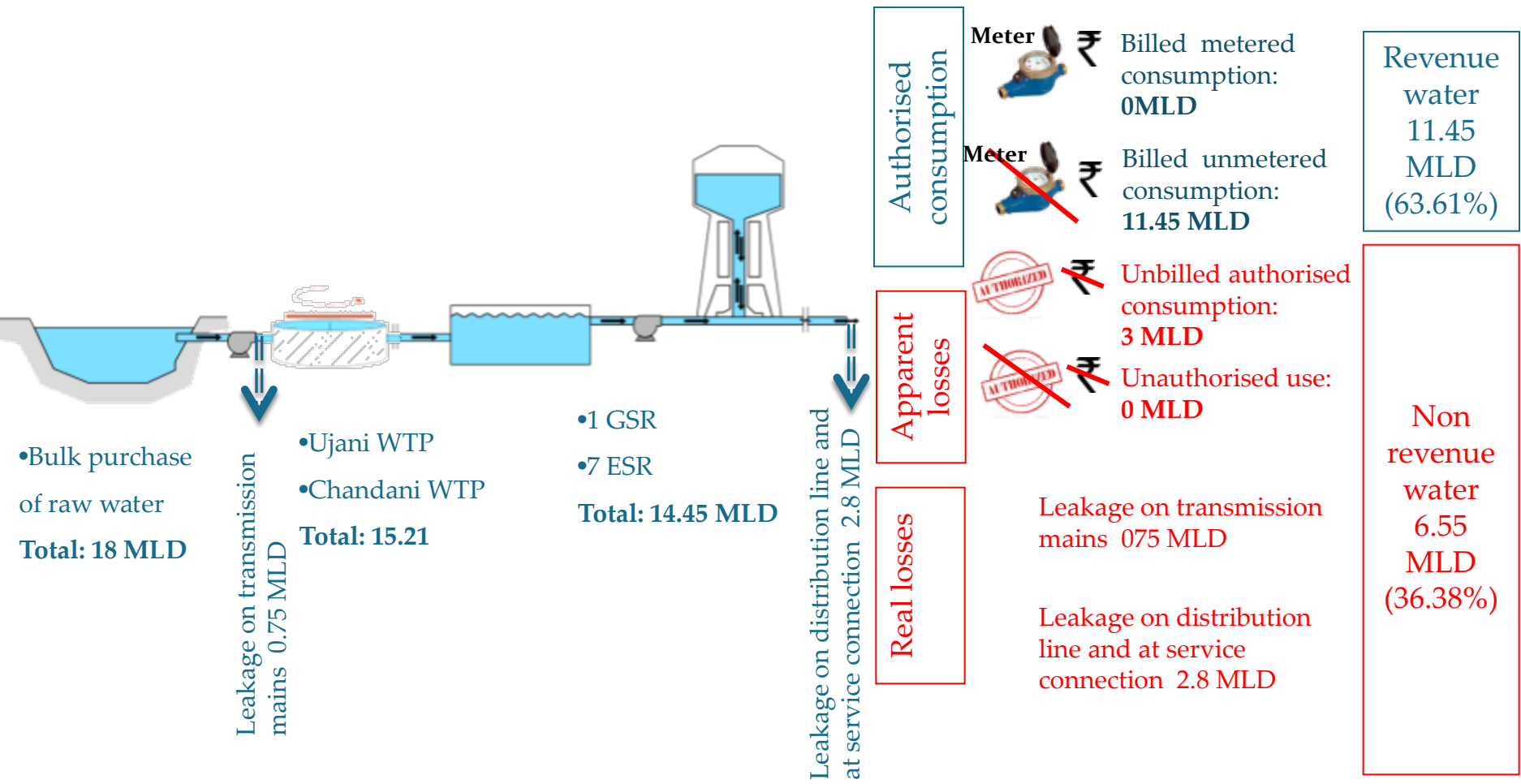
Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project



# Schematic Diagram of Water Supply System: Barshi

System input volume:  
18 MLD

Revenue water:  
11.45 MLD



•Bulk purchase of raw water  
Total: 18 MLD

Leakage on transmission mains 0.75 MLD

•Ujani WTP  
•Chandani WTP  
Total: 15.21

•1 GSR  
•7 ESR  
Total: 14.45 MLD

Leakage on distribution line and at service connection 2.8 MLD

Authorised consumption

Apparent losses

Real losses



Billed metered consumption: 0MLD

Billed unmetered consumption: 11.45 MLD

Unbilled authorised consumption: 3 MLD

Unauthorised use: 0 MLD

Leakage on transmission mains 0.75 MLD

Leakage on distribution line and at service connection 2.8 MLD

Revenue water 11.45 MLD (63.61%)

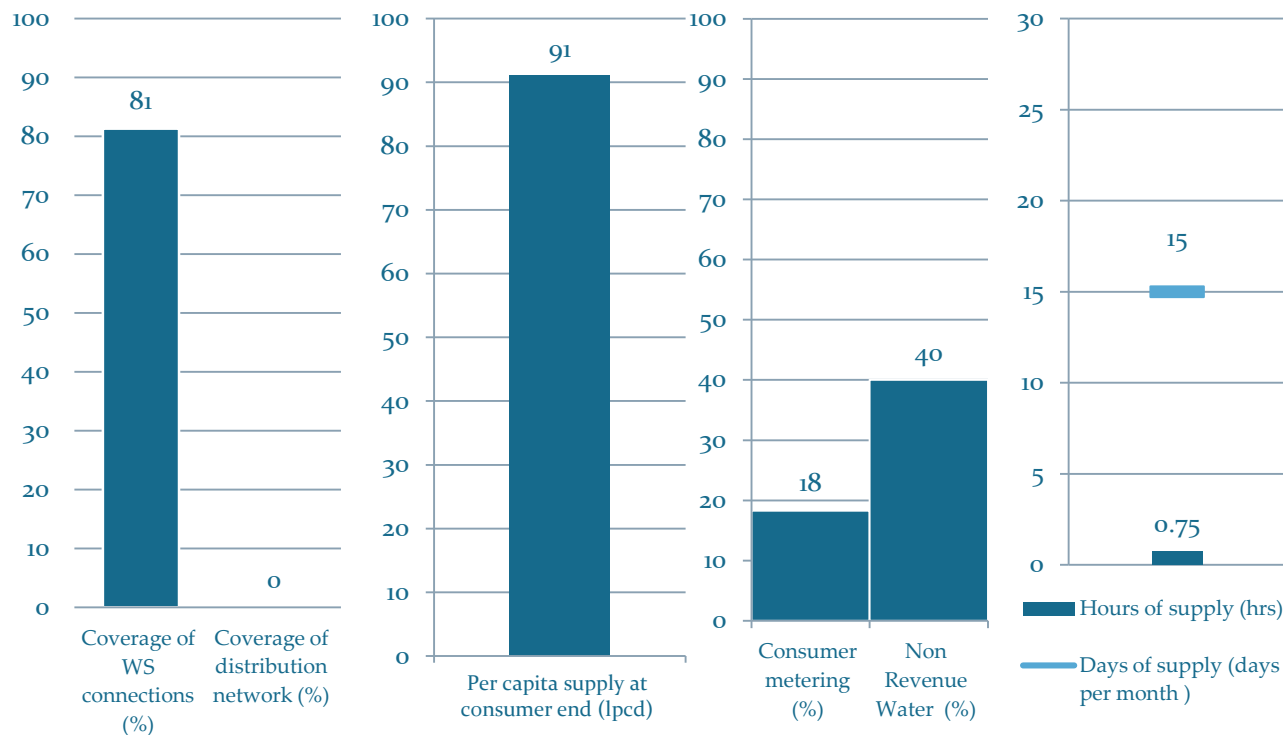
Non revenue water 6.55 MLD (36.38%)

# Beed: Existing situation

## Background Information

- Area (sq. km): 8.29
- Population: 1,86,000
- Slum population: 39.14% of total population
- Number of slums: 20
- No. of wards: 42

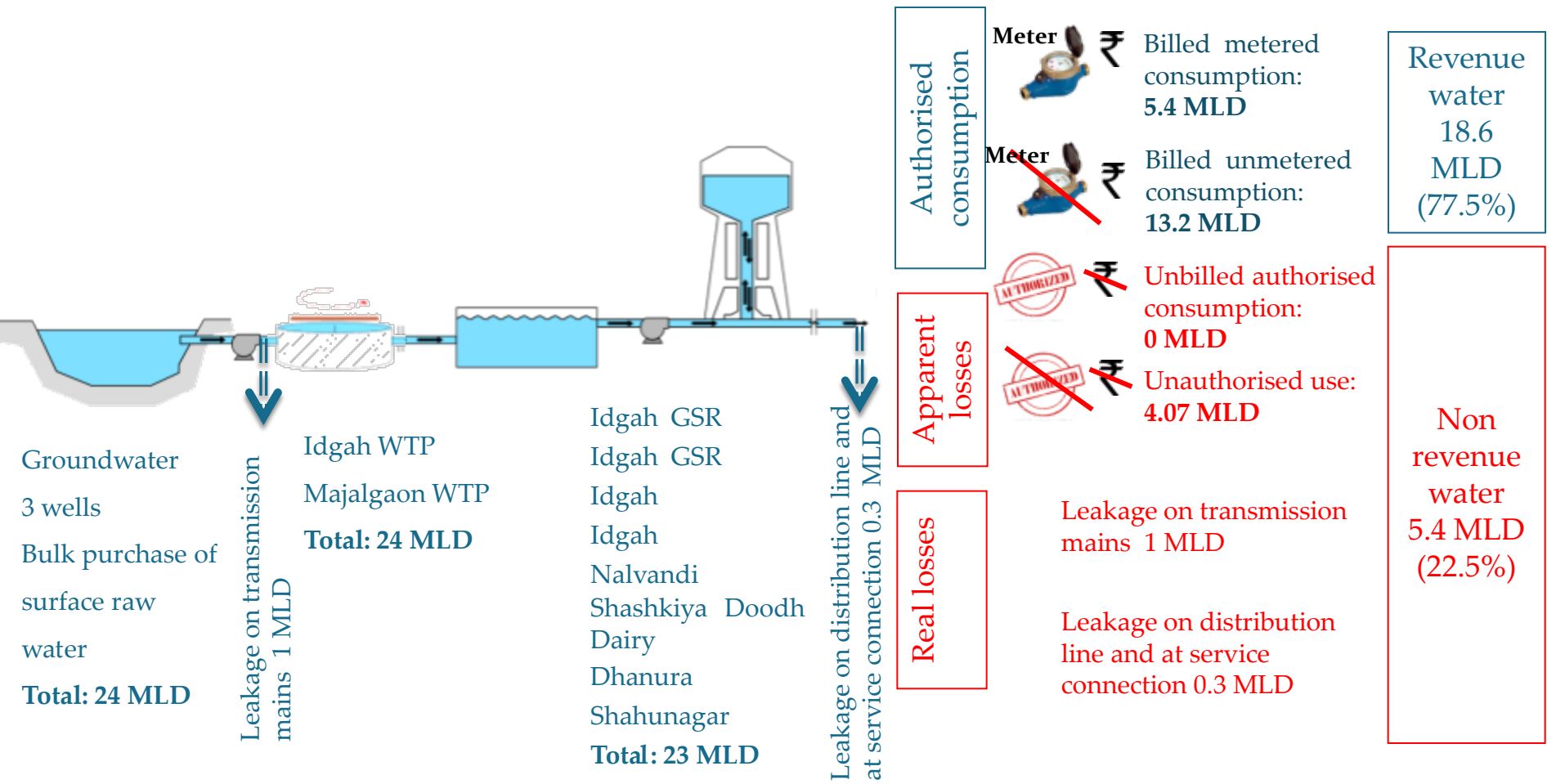
## Performance of Water Supply System



# Schematic Diagram of Water Supply System: Beed

System input volume:  
24 MLD

Revenue water:  
18.6 MLD

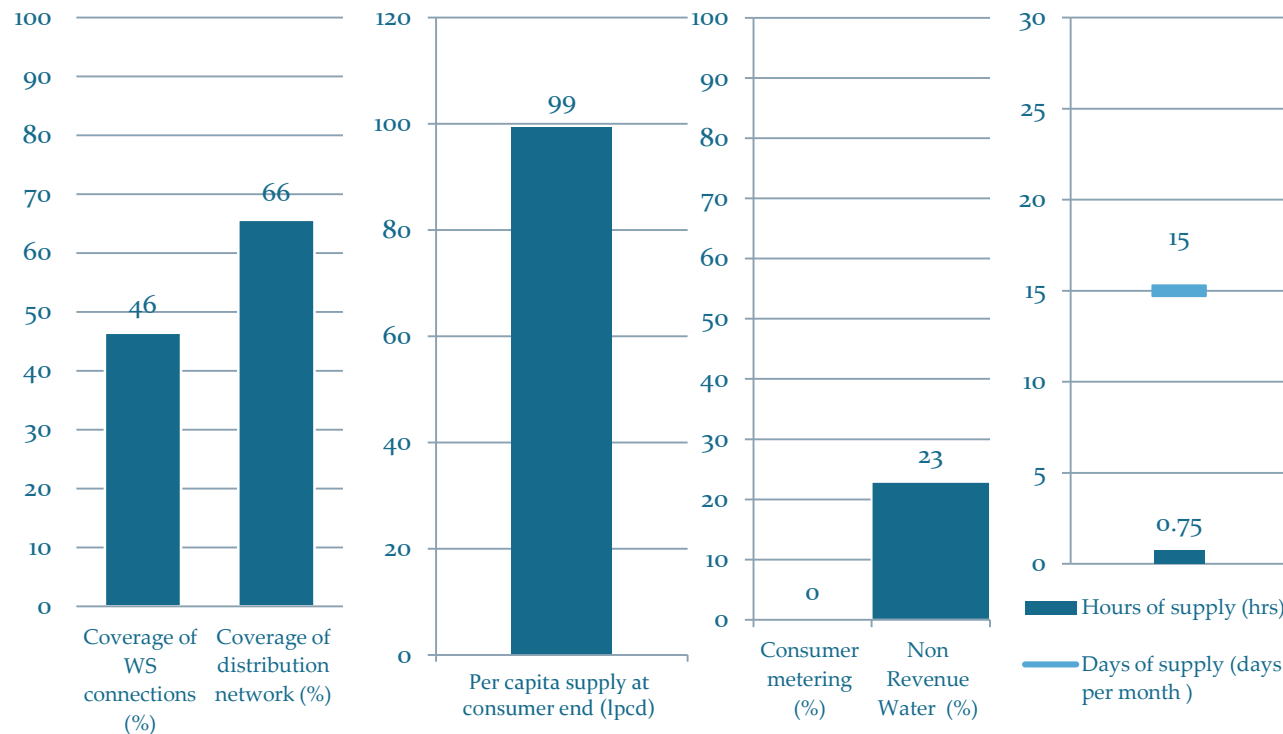


# Bhusawal: Existing situation

## Background Information

- Area (sq. km): 13.38
- Population: 1,86,444
- Slum population: 11.33% of total population
- Number of slums: 17
- Number of wards: 47

## Performance of Water Supply System

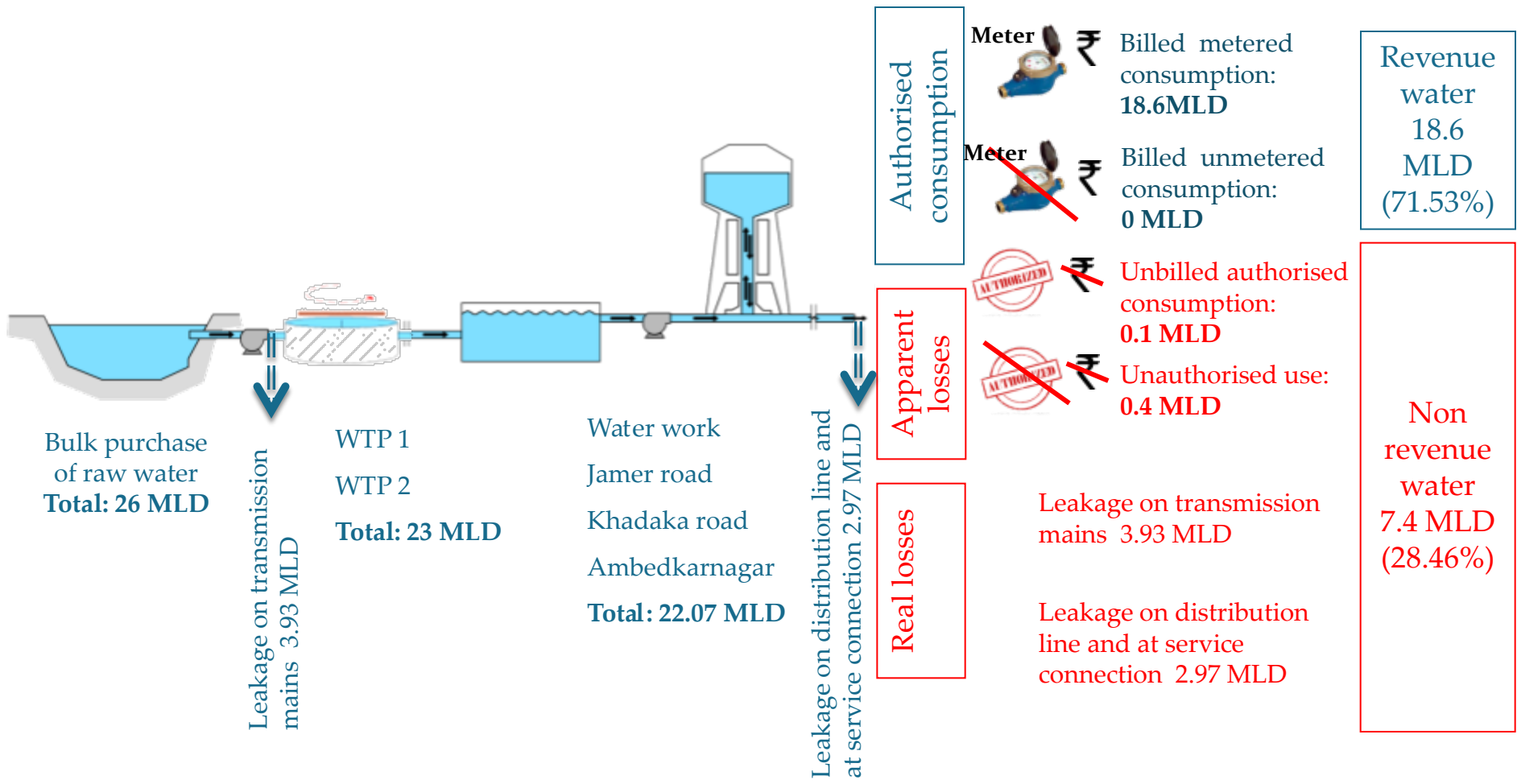


Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project

# Schematic Diagram of Water Supply System: Bhusawal

System input volume:  
26 MLD

Revenue water:  
18.6 MLD



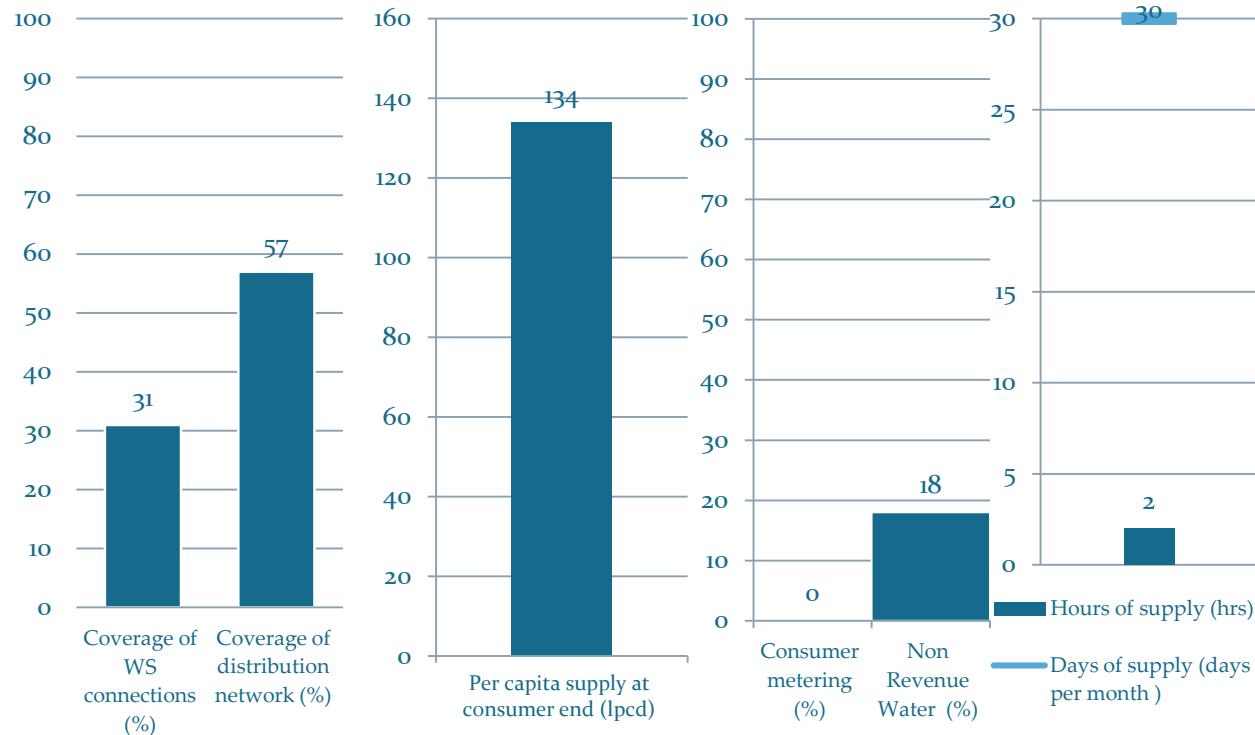


# Chandrapur: Existing Situation

## Background Information

- Area (sq. km): 56.28
- Population: 3,21,436
- Slum population: 11.33% of total population
- Number of slums: 80
- No. of wards: 61

## Performance of Water Supply System

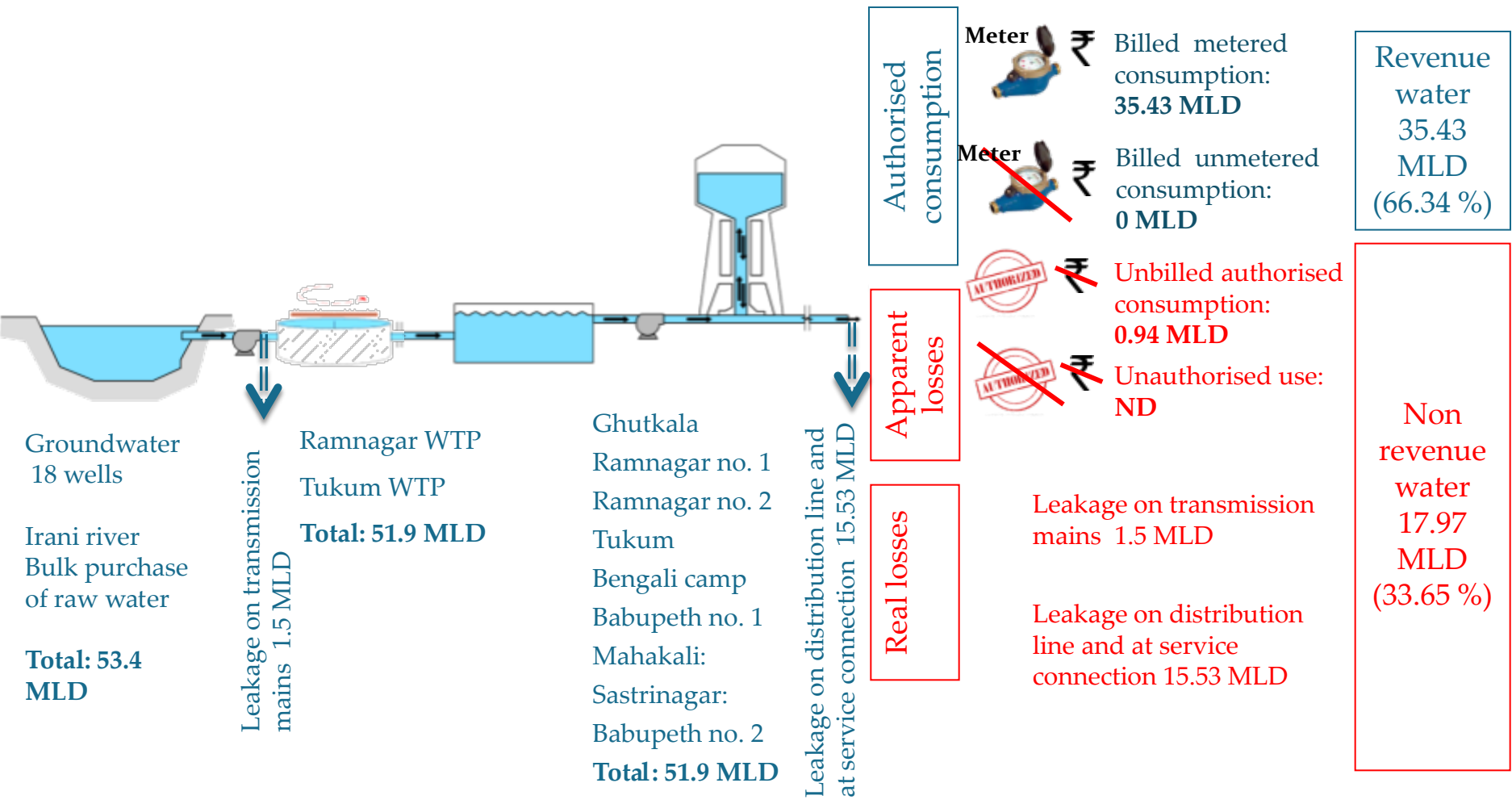


Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project

# Schematic Diagram of Water Supply System: Chandrapur

System input volume:  
53.4 MLD

Revenue water:  
35.43 MLD

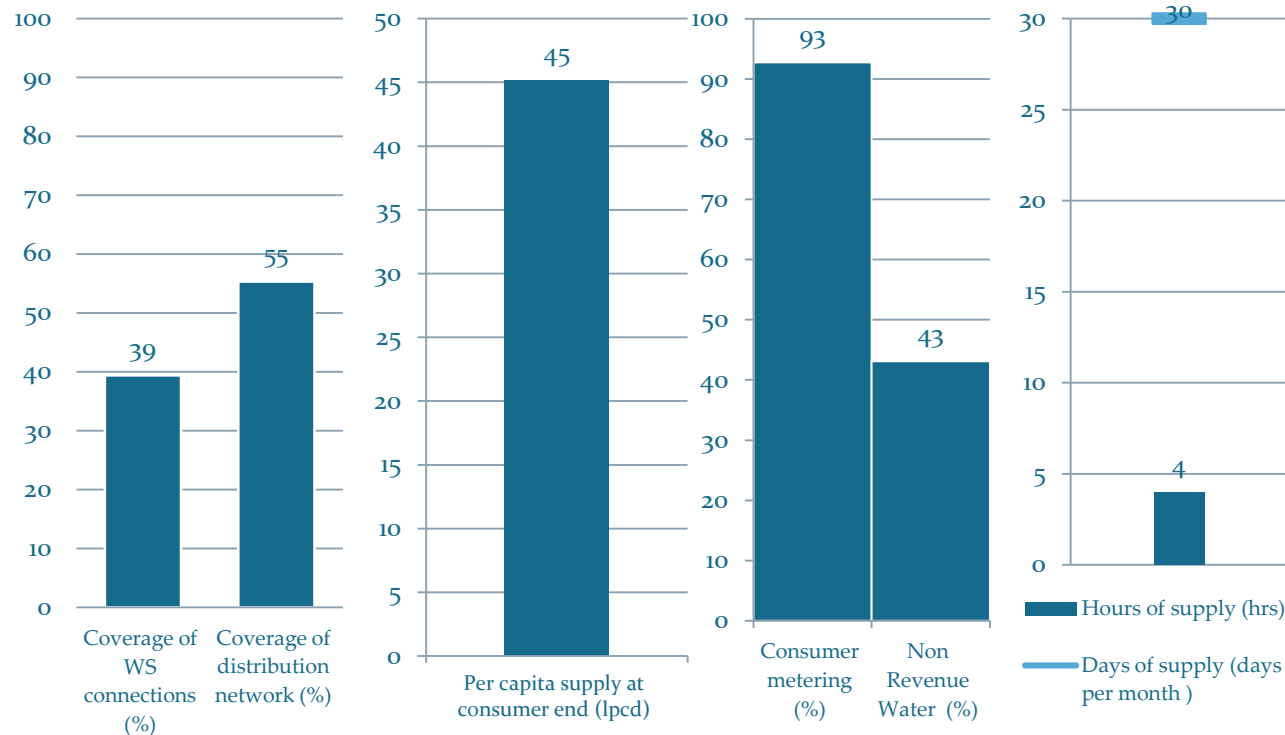


# Gondia: Existing situation

## Background Information

- Area (sq. km): 18.08
- Population: 1,32,889
- Slum population: 33.97% of total population
- Number of Slums: 58
- Number of wards: 39

## Performance of Water Supply System



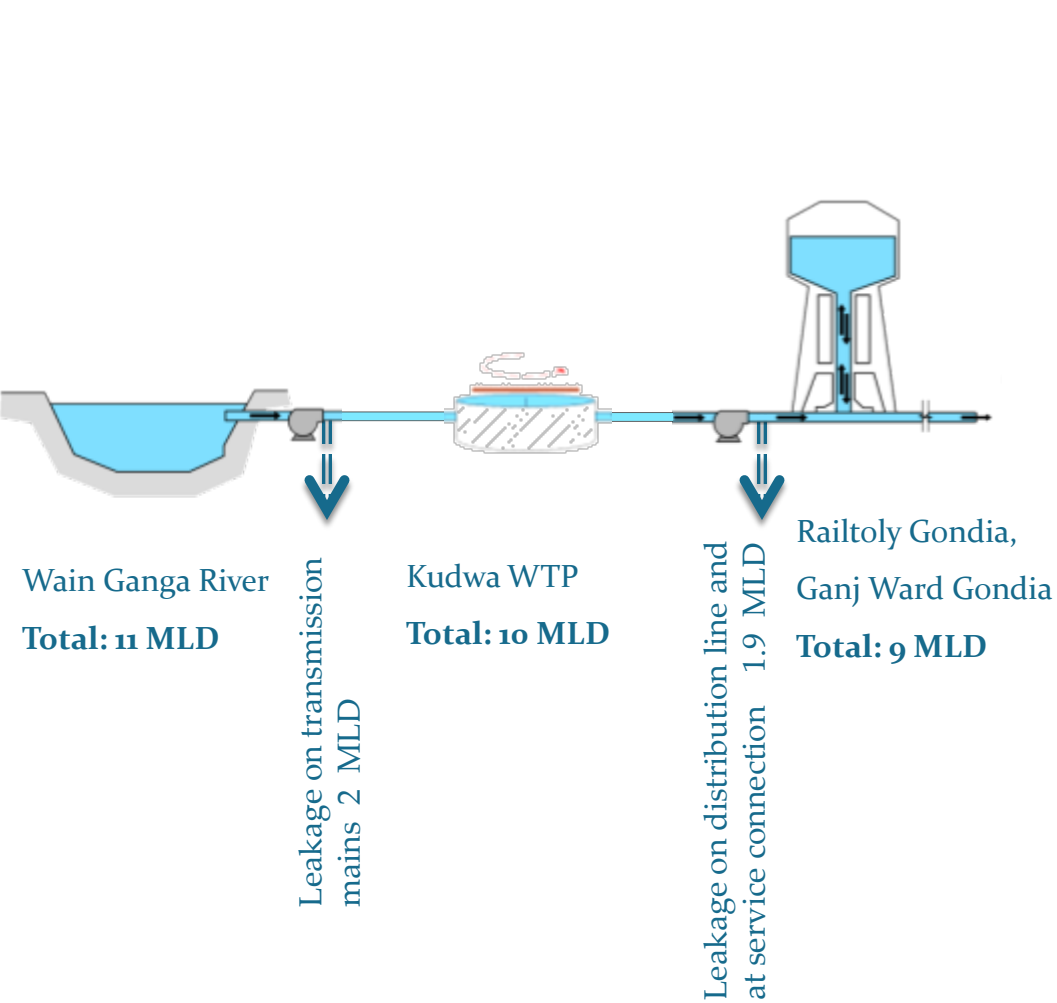
Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project



# Schematic Diagram of Water Supply System: Gondia

System input volume:  
11 MLD

Revenue water:  
6.9 MLD



Authorised consumption

- Billed metered consumption: 5.7 MLD
- Billed unmetered consumption: 1.2 MLD

Revenue water  
6.9 MLD  
(62.72%)

Apparent losses

- Unbilled authorised consumption: 0 MLD
- Unauthorised use: 0.16 MLD

Non revenue water  
4.06 MLD  
(36.90%)

Real losses

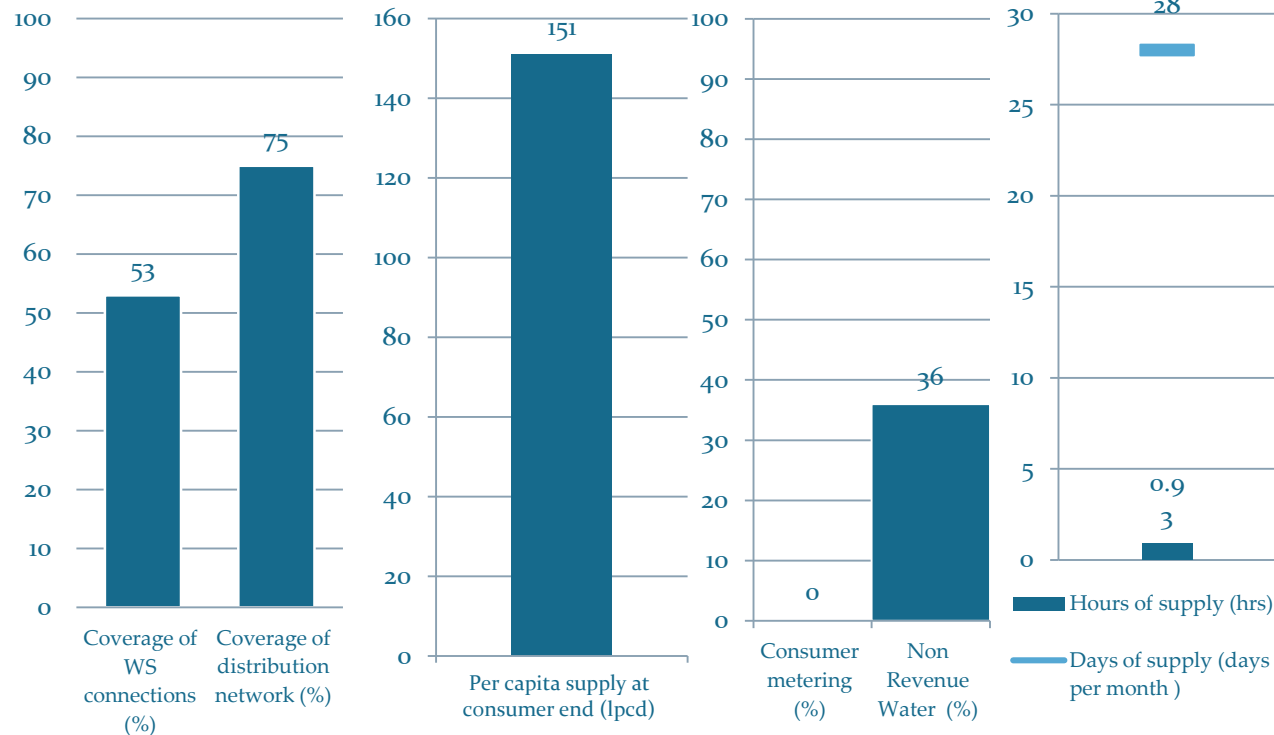
- Leakage on transmission mains 2 MLD
- Leakage on distribution line and at service connection 1.9 MLD

# Ichalkaranji: Existing situation

## Background Information

- Area (sq. km): 29.84
- Population: 2,87,695
- Slum population: 9.79% of total population
- Number of slums: 19
- Number of wards: 57

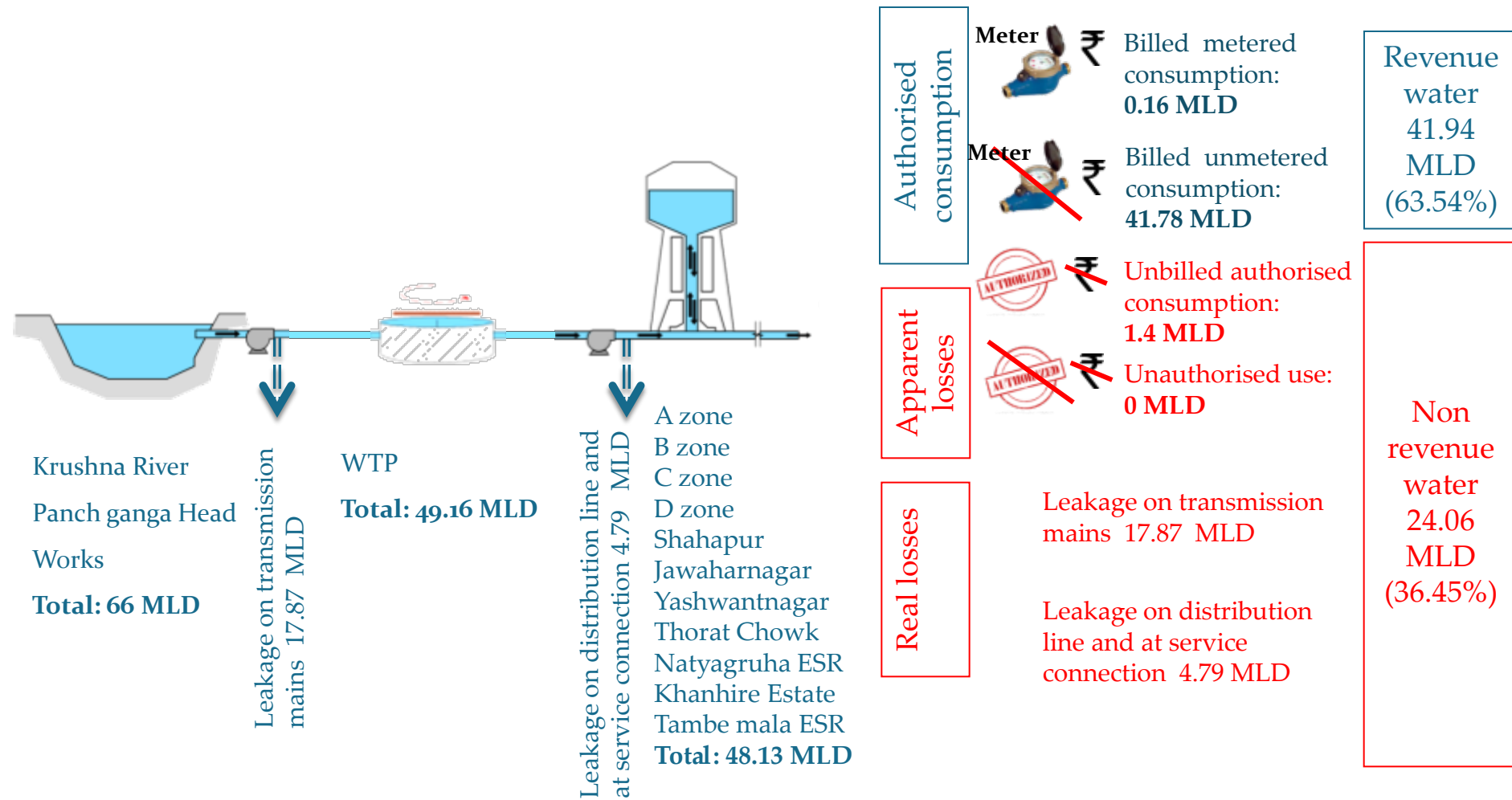
## Performance of Water Supply System



# Schematic Diagram of Water Supply System: Ichalkaranji

System input volume:  
66 MLD

Revenue water:  
41.94 MLD



Krushna River  
Panch ganga Head  
Works  
Total: 66 MLD

Leakage on transmission  
mains 17.87 MLD

WTP  
Total: 49.16 MLD

Leakage on distribution line and  
at service connection 4.79 MLD

A zone  
B zone  
C zone  
D zone  
Shahapur  
Jawaharnagar  
Yashwantnagar  
Thorat Chowk  
Natyagruha ESR  
Khanhire Estate  
Tambe mala ESR  
Total: 48.13 MLD

Authorised  
consumption

Meter ₹ Billed metered  
consumption:  
0.16 MLD

Meter ₹ Billed unmetered  
consumption:  
41.78 MLD

Revenue  
water  
41.94  
MLD  
(63.54%)

Apparent  
losses

~~AUTHORIZED~~ ₹ Unbilled authorised  
consumption:  
1.4 MLD

~~AUTHORIZED~~ ₹ Unauthorised use:  
0 MLD

Non  
revenue  
water  
24.06  
MLD  
(36.45%)

Real losses

Leakage on transmission  
mains 17.87 MLD

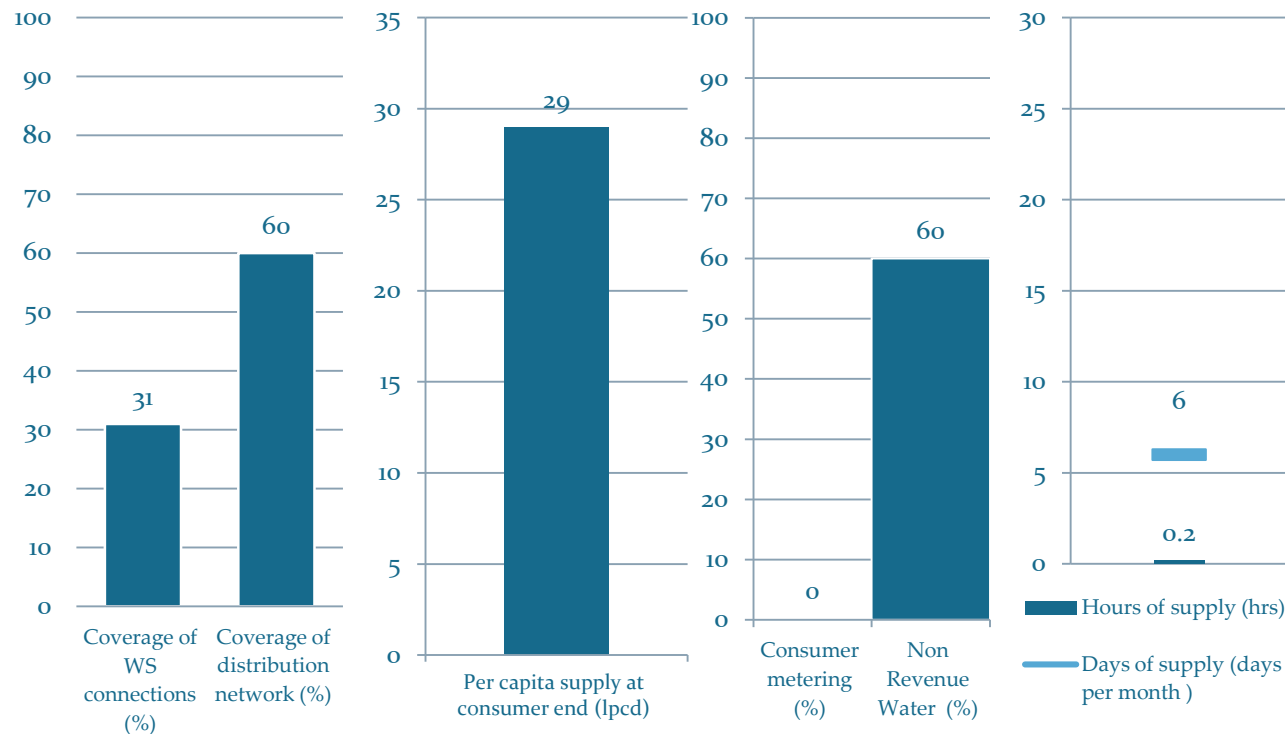
Leakage on distribution  
line and at service  
connection 4.79 MLD

# Jalna: Existing Situation

## Background Information

- Area (sq. km): 81.86
- Population: 2,85,349
- Slum population: 25.74% of total population
- Number of slums: 53
- Number of wards: 18

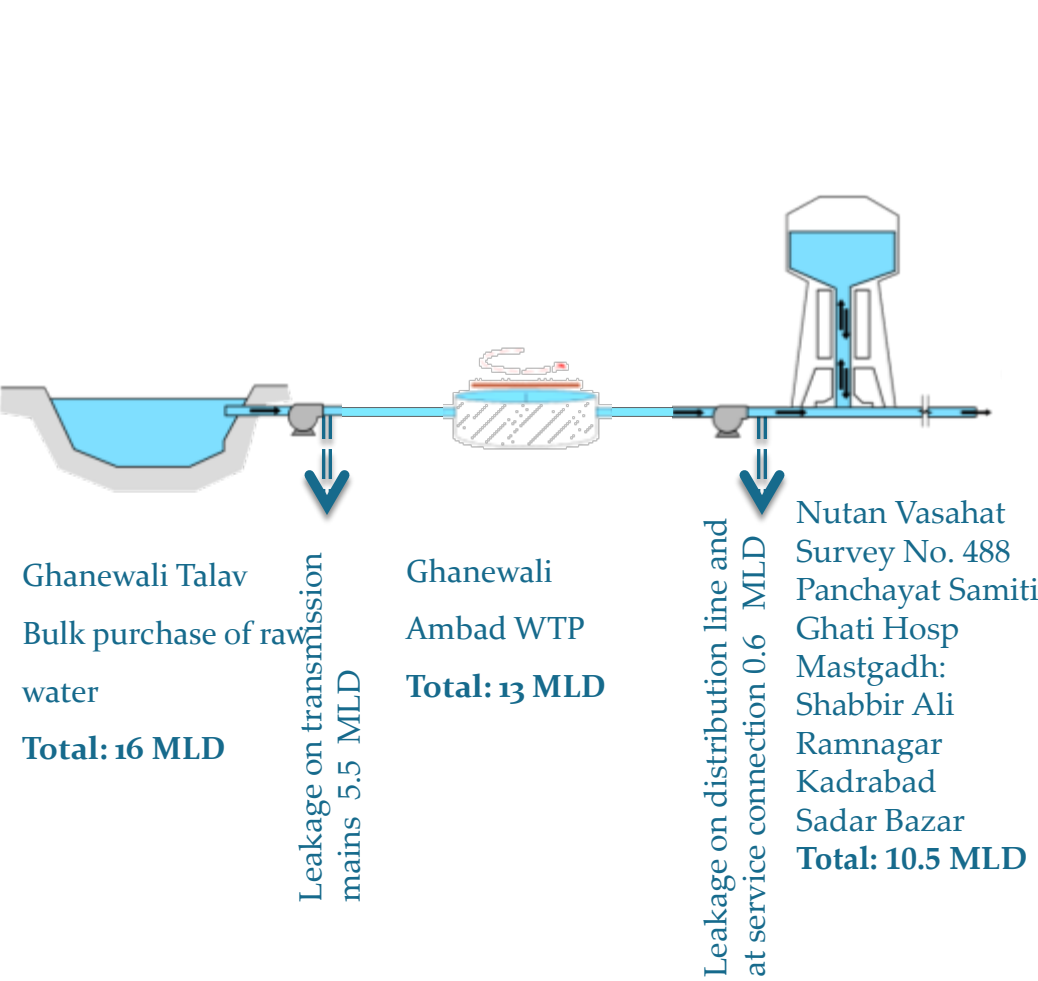
## Performance of water supply system







# Schematic Diagram of Water Supply System: Jalna

System input volume:  
16 MLD

Revenue water:  
7.15 MLD



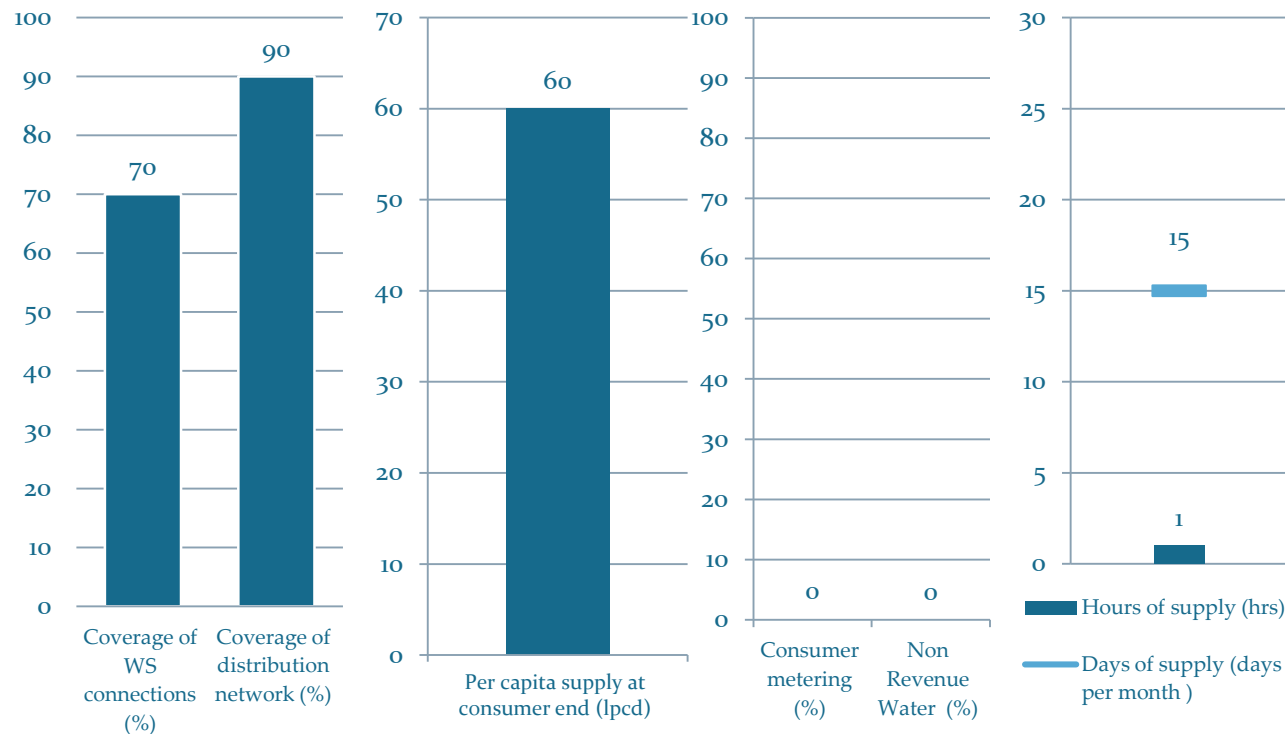
Authorised consumption	 ₹ Billed metered consumption: 0 MLD	Revenue water 7.15 MLD (44.68 %)
	 ₹ Billed unmetered consumption: 7.15 MLD	
Apparent losses	 ₹ Unbilled authorised consumption: 0 MLD	Non revenue water 8.85 MLD (55.31%)
	 ₹ Unauthorised use: 2.75 MLD	
Real losses	Leakage on transmission mains 5.5 MLD	
	Leakage on distribution line and at service connection 0.6 MLD	

# Latur: Existing situation

## Background Information

- Area (sq. km): 33
- Population: 3,82,754
- Slum population: 34% of total population
- Number of slums: 73
- Number of wards: 22

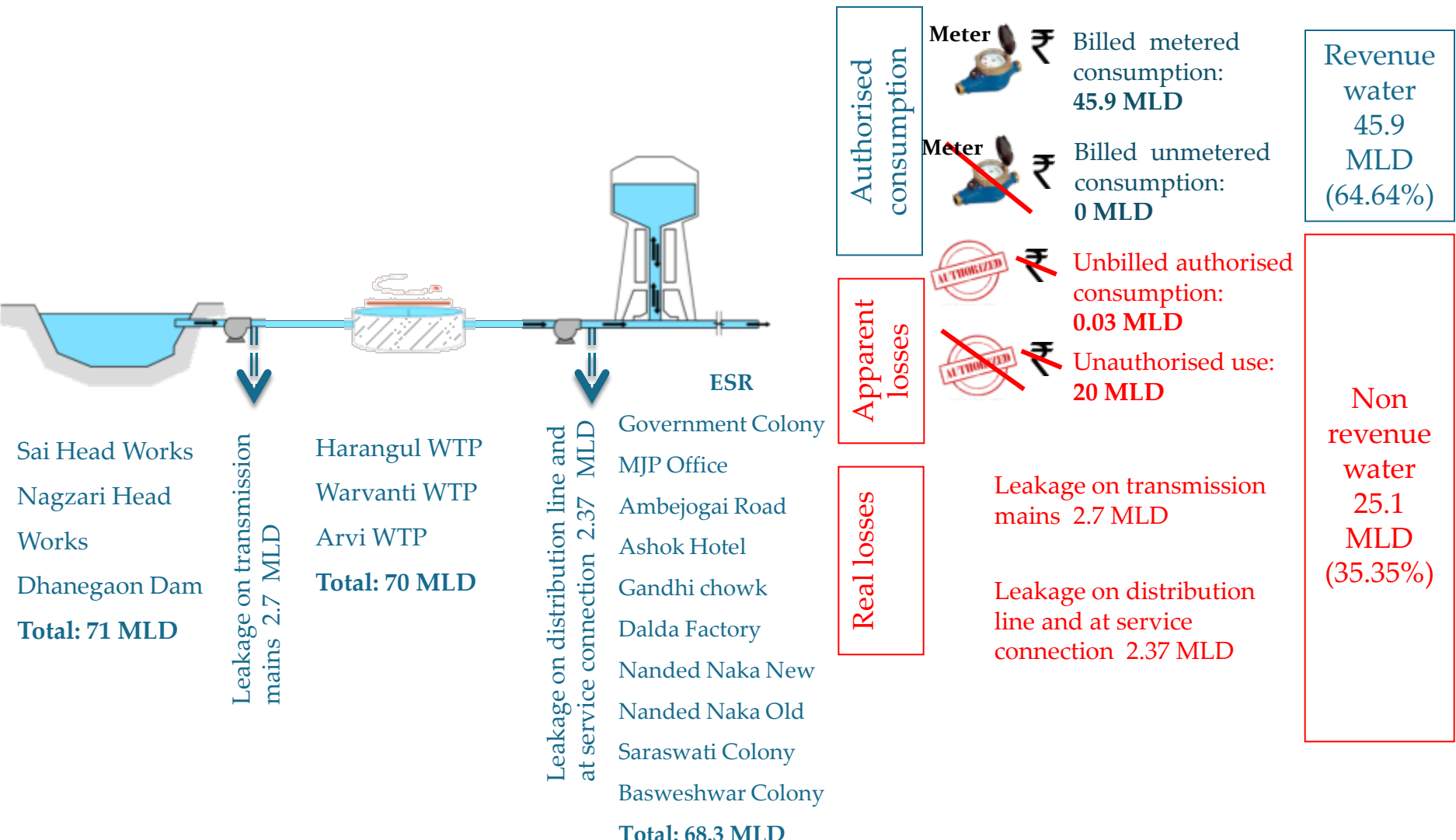
## Performance of Water Supply System





# Schematic Diagram of Water Supply System: Latur

System input volume: **71 MLD** -----> Revenue water: **45.9 MLD**

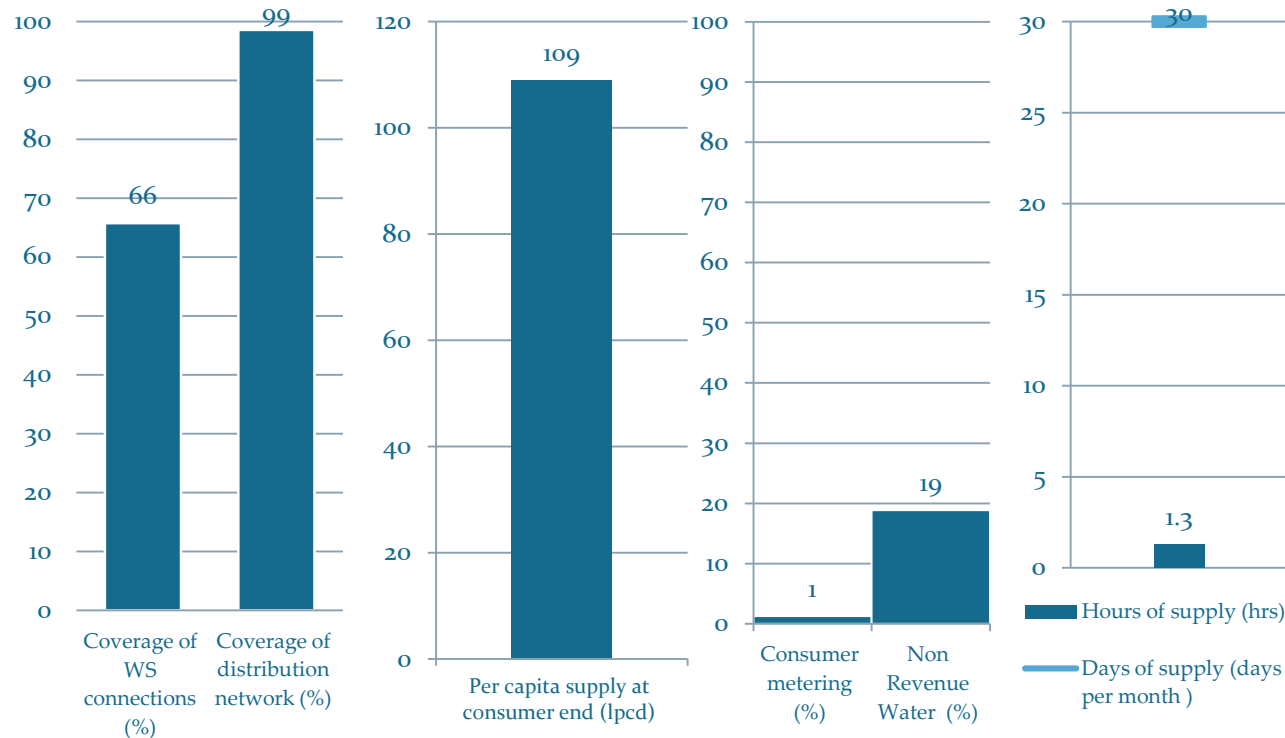


# Panvel: Existing Situation

## Background Information

- Area (sq. km): 12.17
- Population: 1,90,000
- Slum population: 5.76% of total population
- Number of slums: 15
- Number of wards: 38

## Performance of Water Supply System



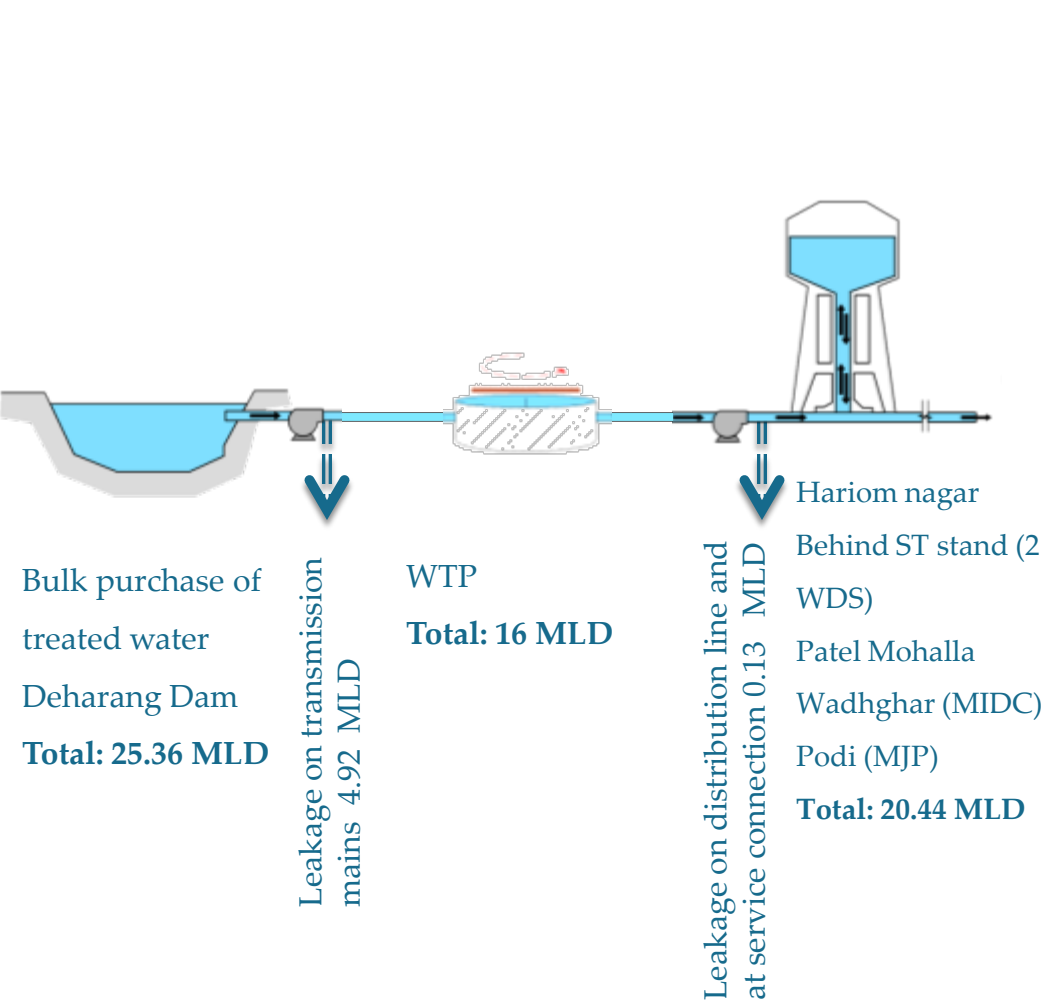
Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project







# Schematic Diagram of Water Supply System: Panvel

System input volume:  
25.36 MLD

Revenue water:  
20.29 MLD



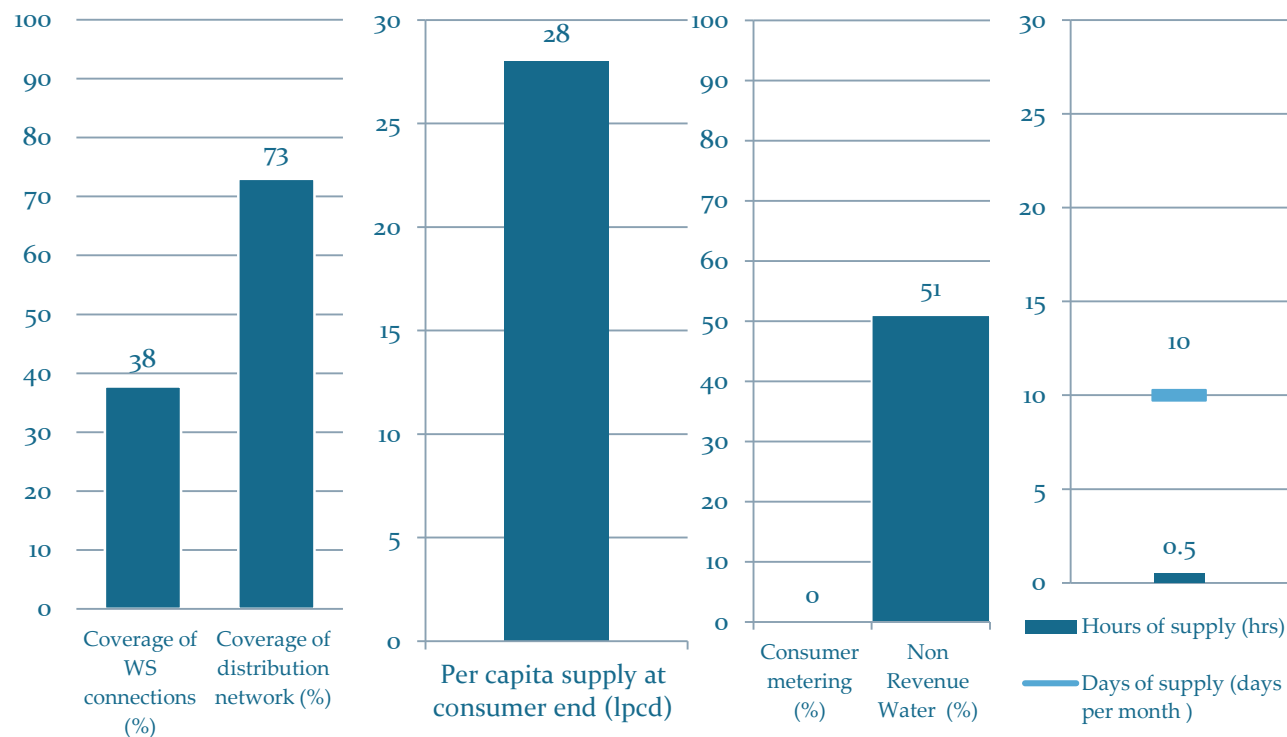
Authorised consumption	 ₹ Billed metered consumption: 2.5 MLD	Revenue water 20.29 MLD (80.00%)	
	 ₹ Billed unmetered consumption: 17.79 MLD		
Apparent losses	 ₹ Unbilled authorised consumption: 0.021 MLD		Non revenue water 5.07 MLD (19.99%)
	 ₹ Unauthorised use: 0 MLD		
Real losses	Leakage on transmission mains 4.92MLD		
	Leakage on distribution line and at service connection 0.13 MLD		

# Parbhani: Existing Situation

## Background Information

- Area (sq. km): 57.61
- Population: 3,07,000
- Slum population: 43.04% of total population
- Number of slums: 71
- Number of wards: 57

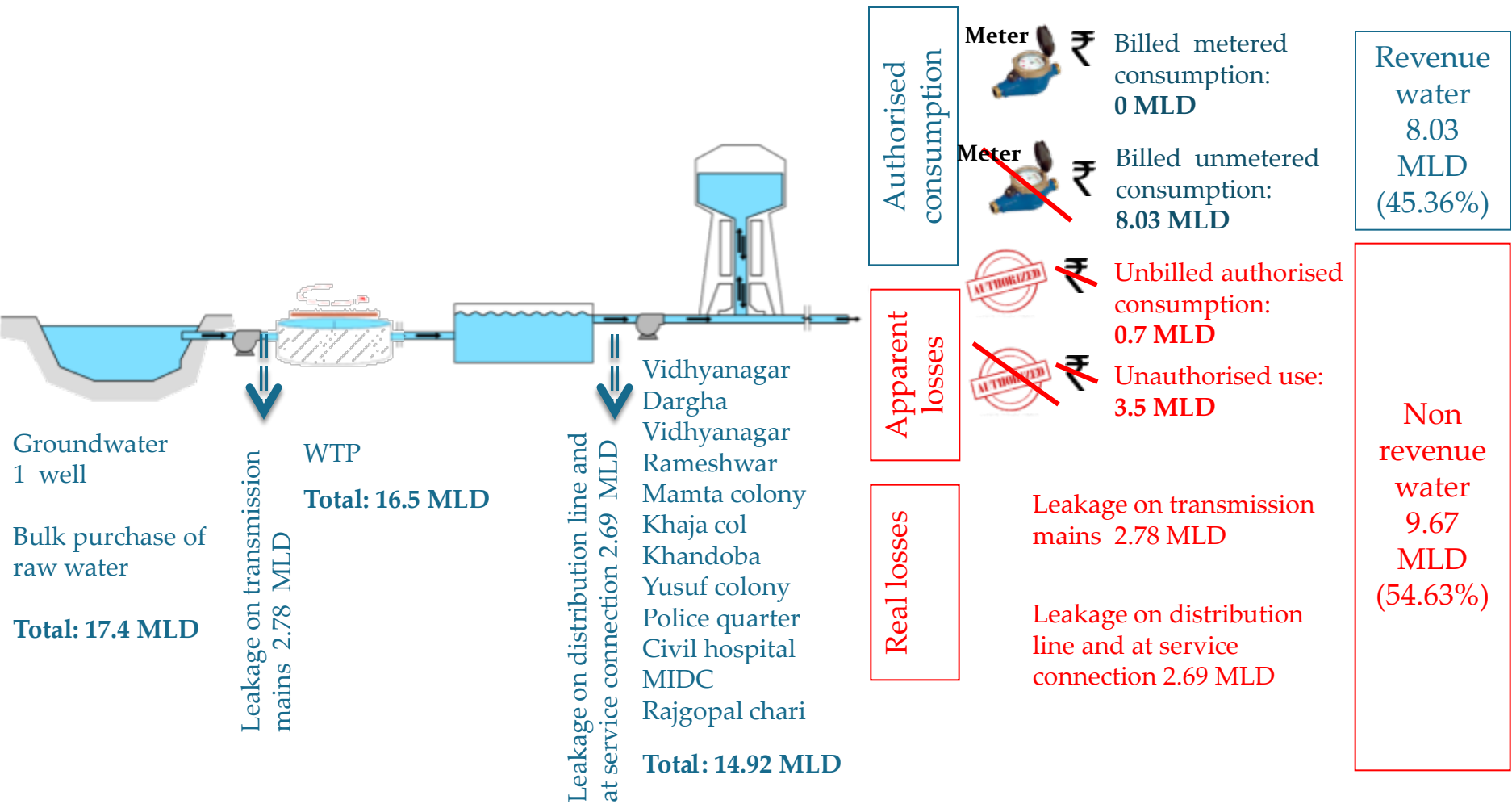
## Performance of Water Supply System



# Schematic Diagram of Water Supply System: Parbhani

System input volume:  
17.7 MLD

Revenue water:  
8.03 MLD

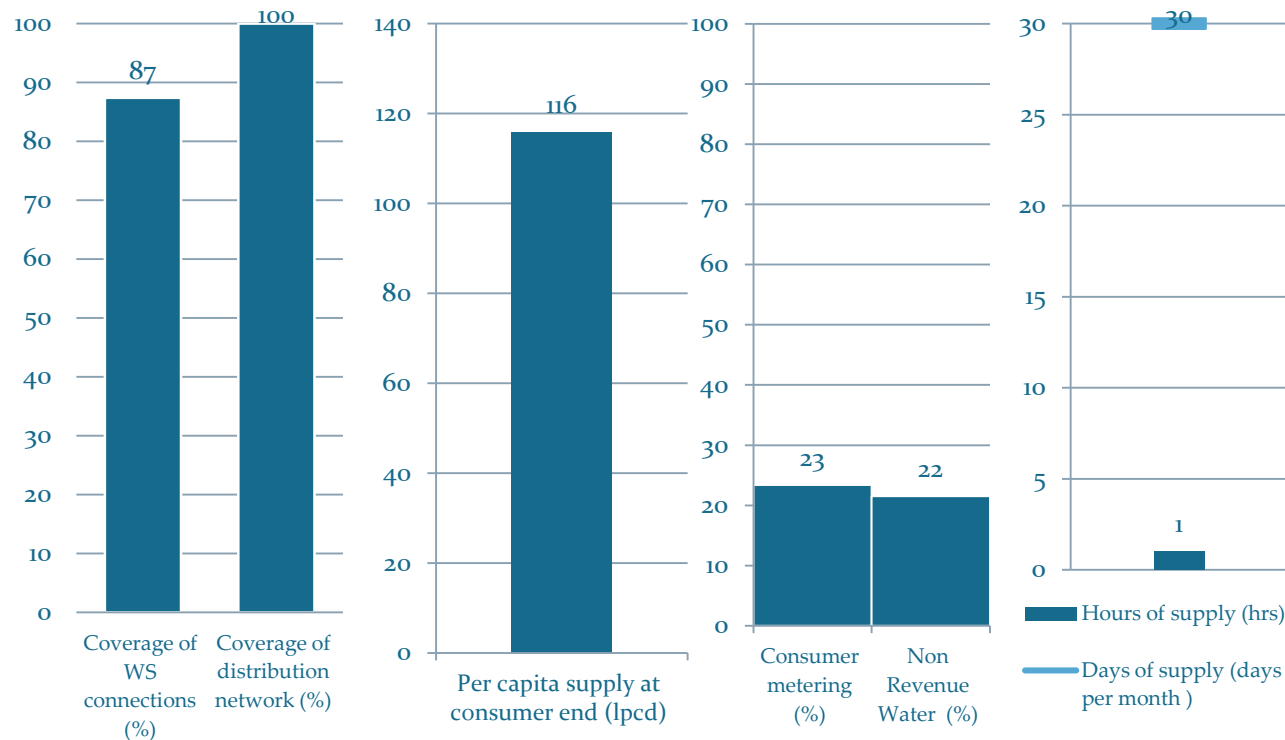


# Satara: Existing Situation

## Background Information

- Area (sq. km): 8.15
- Population: 1,20,079
- Slum population: 9.16% of total population
- Number of Slums: 21
- Number of wards: 39

## Performance of Water Supply System

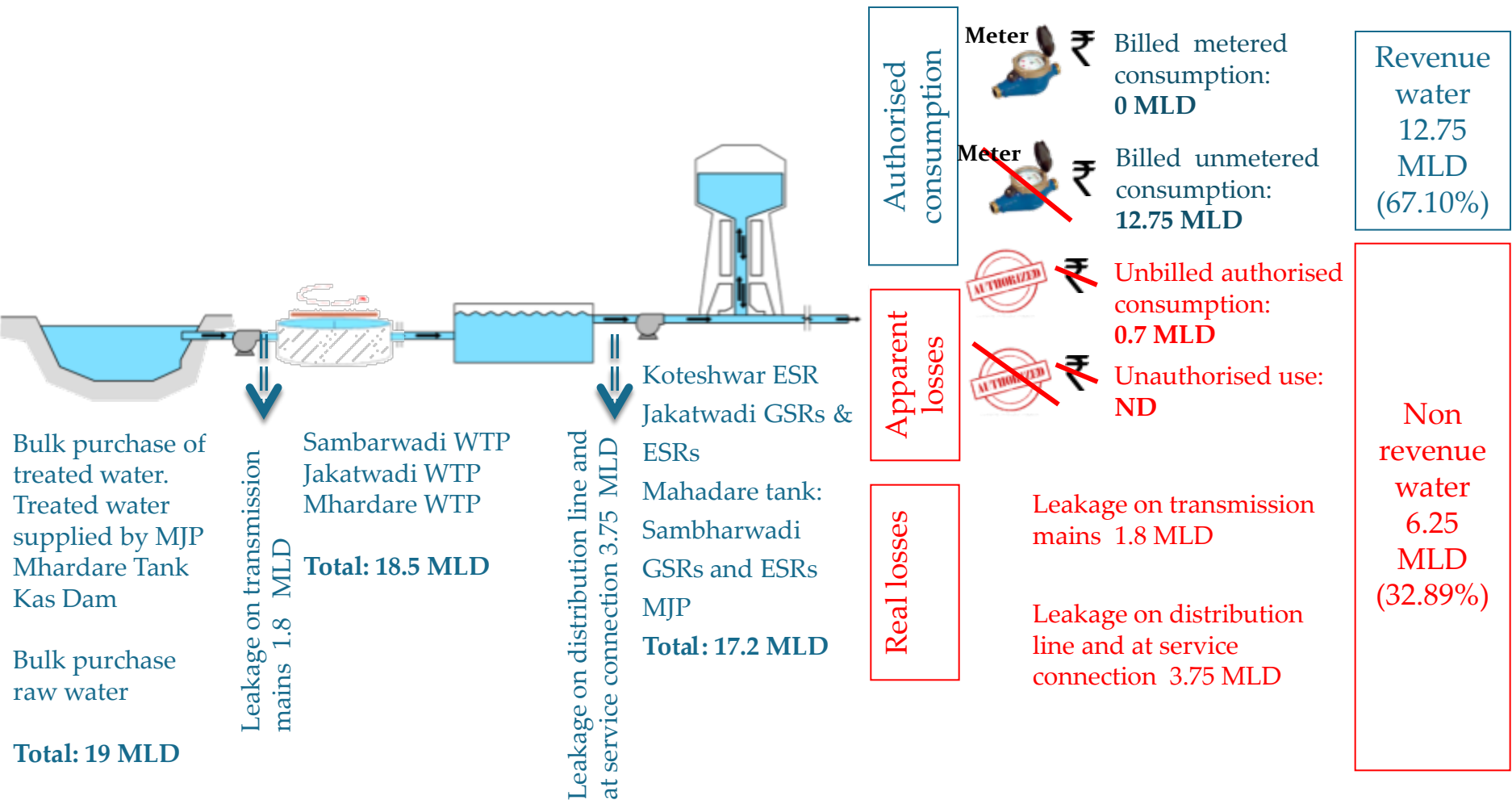


Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project

# Schematic Diagram of Water Supply System: Satara

System input volume:  
19 MLD

Revenue water:  
12.75 MLD

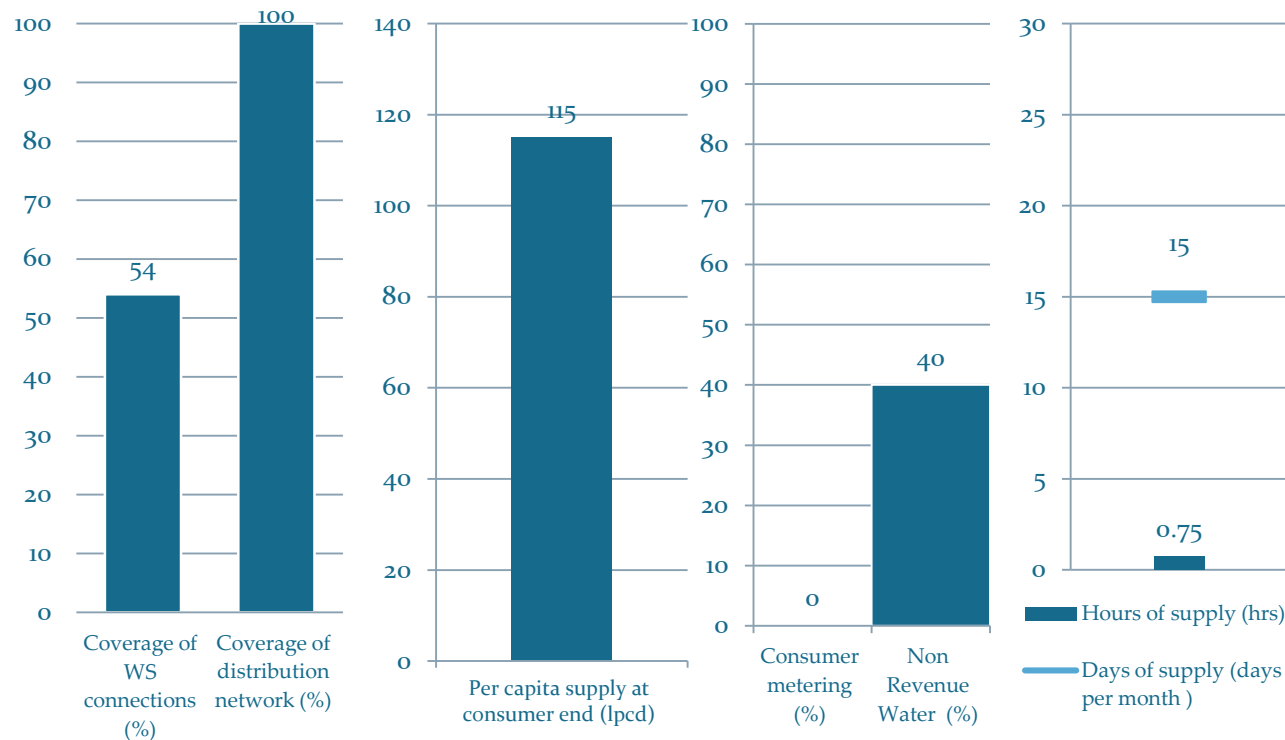


# Wardha: Existing Situation

## Background Information

- Area (sq. km): 7.44
- Population: 1,06,439
- Slum population: 17% of total population
- Number of Slums: 17
- Number of wards: 13

## Performance of Water Supply System



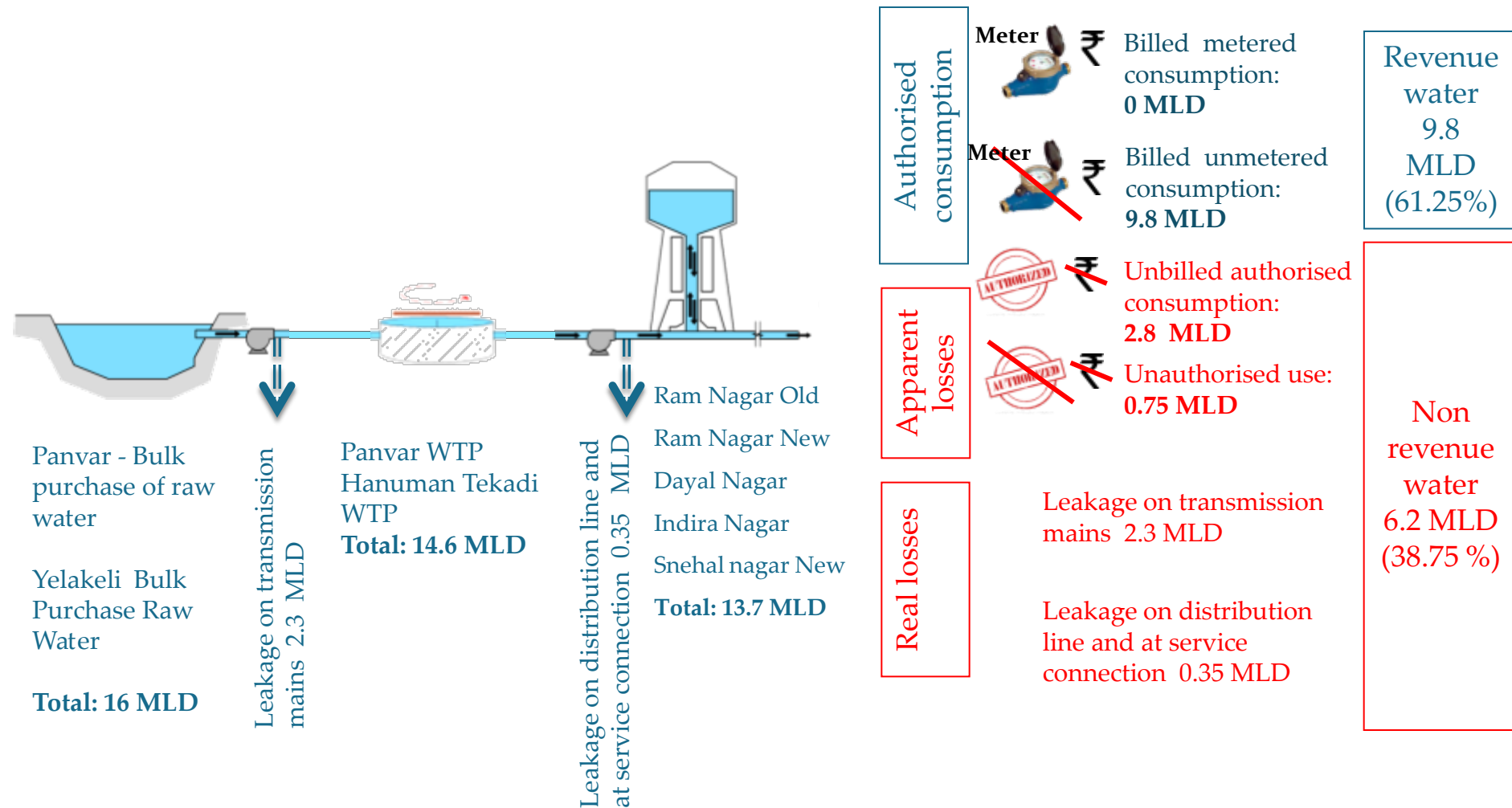
Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project



# Schematic Diagram of Water Supply System: Wardha

System input volume:  
16 MLD

Revenue water:  
9.8 MLD

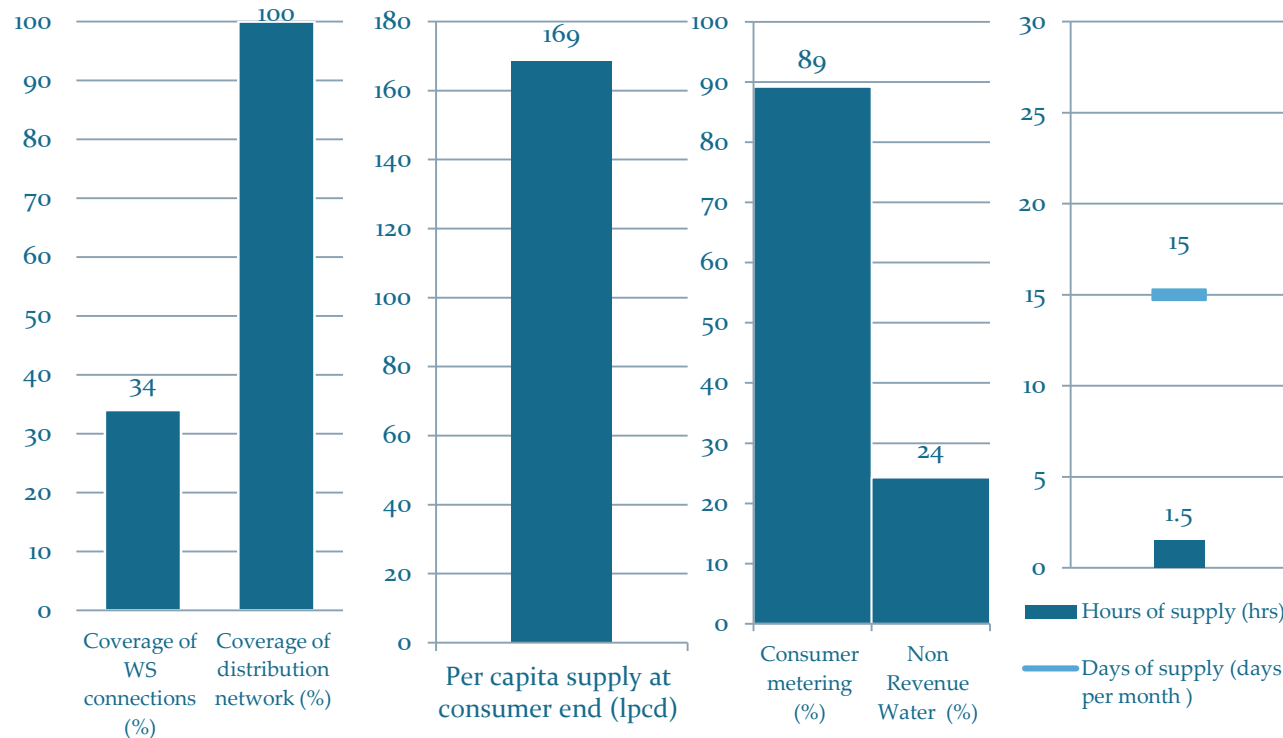


# Yavatmal: Existing situation

## Background Information

- Area (sq. km): 10.17
- Population: 1,16,714
- Slum population: 38% of total population
- Number of alums: 25
- Number of wards: 40

## Performance of Water Supply System



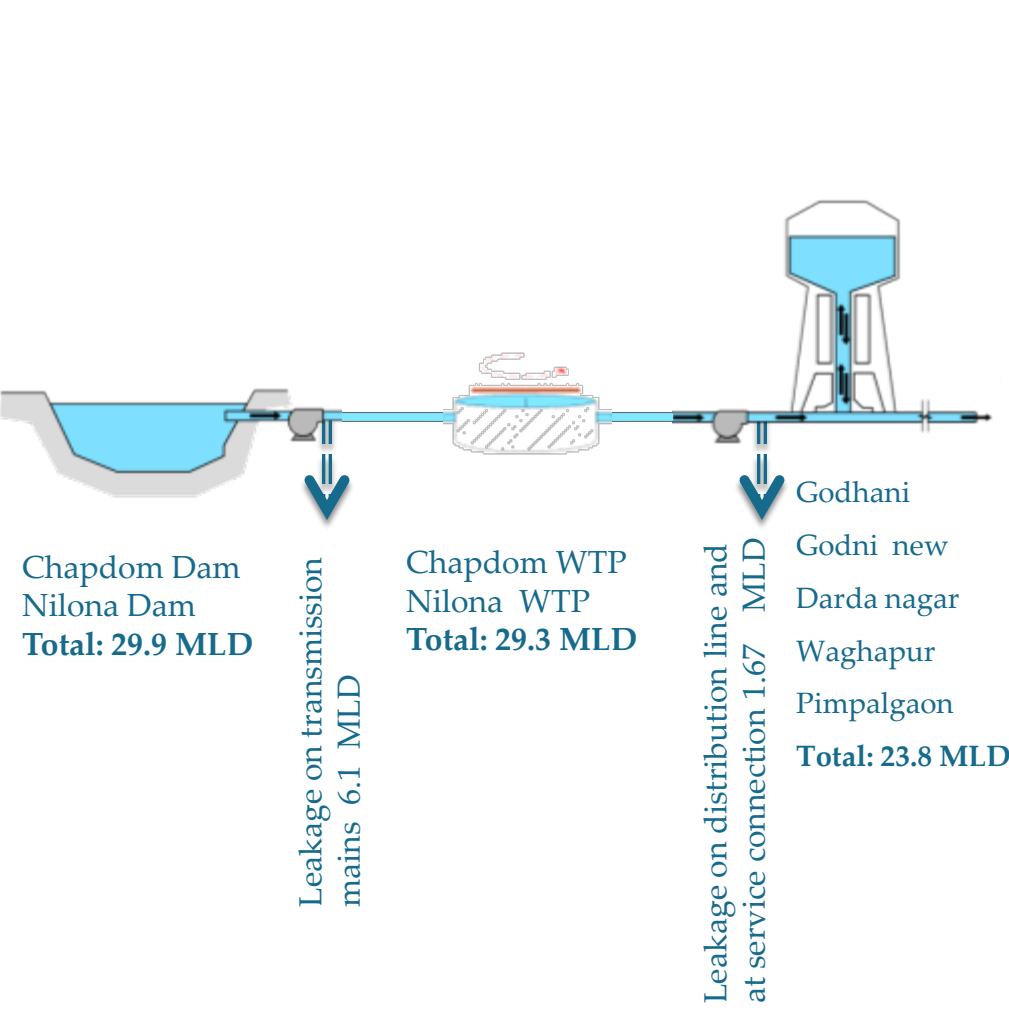
Source: Compiled from PIP Reports of Class 'A' Cities of Maharashtra developed under PAS Project







# Schematic Diagram of Water Supply System: Yavatmal

System input volume:  
29.9 MLD

Revenue water:  
22.13 MLD



Authorised consumption	 ₹ Billed metered consumption: 22.13 MLD	Revenue water 22.13 MLD (74.01 %)
	 ₹ Billed unmetered consumption: 0 MLD	
Apparent losses	 ₹ Unbilled authorised consumption: 0 MLD	Non revenue water 7.77MLD (25.98 %)
	 ₹ Unauthorised use: 0 MLD	
Real losses	Leakage on transmission mains 6.1 MLD	
	Leakage on distribution line and at service connection 1.67 MLD	

Thank You