Strategies for transitioning from intermittent to **24*7 water supply**

Yumna Sareshwala |PUI23448

Guided By
Upasana Yadav | Omkar Kane

Source: Global citizen (2024). India Pledges to Provide Clean Water to All Rural Households by 2024 (globalcitizen.org)

INDIAN CITIES ARE MOVING TOWARDS PIPED WATER SUPPLY

Three 24x7 water areas getting supply for 1-2 hrs since a month

Anjaya Anparthi / TNN / Apr 2, 2022, 04:14 IST

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Nagpur: Three localities declared to be part of the 24x7 water supply network are reportedly getting drinking water supply for only 1-2 hours, that too at low pressure, causing severe shortage of water for last one month. Nagpur Municipal Corporation (NMC) and its private operator Orange City Water Private Limited (OCW) claim the problem developed due to an unknown leak, but have failed to trace it over last one month.

Pipe dream: Why India's plan for continuous water supply remains unrealistic, 25 years on

The 2023 draft of the Manual on Water Supply and Treatment underestimates water demand as well as demand-limiting tariffs.

David Meyer, The Conversation & Nidhi Subramanyam, The Conversation

Dec 28, 2023 · 07:30 pm

READ IN APP

Tap water coverage hits 70%, sewerage coverage reaches 62% in 500 Cities: Economic Survey

2d • 2 min read

Piped water supply rising in Gujarat cities: Study

TNN / Mar 22, 2021, 08:05 IST

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With majority of the cities of Gujarat getting piped water, the need of the hour is to improve water management and improve service, claimed a study carried out by the Centre for Water and Sanitation at CEPT University. The researchers also advocated water audit and metered connections to improve monitoring.

Picture used for representational purpose only

AHMEDABAD: With majority of the cities of Gujarat getting piped water, the need of the hour is to improve water management and improve service, claimed a study carried out by the Centre for Water and Sanitation at CEPT University. The researchers also advocated water audit and metered connections to improve monitoring.

The study titled 'Urban drinking water security in Gujarat' by Meera Mehta, Dinesh Mehta and Jaladhi Vavaliya was recently published in Journal of Social and Economic Development.

Puri becomes 1st Indian city to get 24x7 clean and filtered piped drinking water supply

Debabrata Mohapatra / TNN / Updated: Jul 26, 2021, 21:13 IST

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The launch of 'Sujal: drink from tap mission' in Puri is a new chapter in Odisha's development.

BHUBANESWAR: Puri, which attracts two crore tourists every year, has now earned the unique distinction of becoming the first Indian city to get round-the-clock piped pure drinking water.

Launching the ambitious project under the banner of 'Sujal - drink from tap mission' through the virtual platform, Odisha chief minister Naveen Patnaik on Monday said Puri has now joined the league of international cities like London, New York and Singapore in supplying quality piped drinking water from taps 24/7.

Source: Three 24x7 water areas getting supply for 1-2 hrs since a month | Nagpur News - Times of India, Piped water supply rising in Gujarat cities: Study | Ahmedabad News - Times of India, Tap water coverage hits 70%, sewerage coverage reaches 62% in 500 Cities: Economic Survey

WHAT IS INTERMITTENT WATER SUPPLY ?

IWS systems can be defined as piped water supply service that is available to consumers less than 24 hours per day. In an IWS situation, the consumers usually secure their water supply through the use of ground or roof tanks, where water is stored during the length of time that the supply is provided.

A piped water supply & distribution system is intermittent when water continuity is for less than 24 hours a day or not on all days of the week.

IWS systems can be broadly categorised into 3 types: **Predictable, Irregular & Uncertain**.

IWS Type	Supply Frequency	Water Quantity	Reliability
Predictable	5 days or more	Sufficient	High
Irregular	2-4 days	Certain amount	Medium
Uncertain	Few hours	Insufficient	Low

CHALLENGES OF INTERMITTENT WATER SUPPLY

Infrastructure Challenge

•Aging water supply networks.
•Limited capacity of treatment plants and distribution stations.

Water Scarcity and Resource Availability

- While cities face water scarcity issues there is dependence on alternatives like groundwater, private water markets and bottled water.
- Vulnerable populations struggle to

Operational Challenges

•Frequent system breakdowns causing uneven water pressure.
•Cross contamination of water with sewer water affecting water quality

Technical Challenges

•High water losses in distribution and transmission networks.
•Lack of advanced systems (e.g., SCADA, smart metering) to monitor and reduce losses.
•Ineffective management of unauthorized water connections

Financial Challenges

- High infrastructure and operational cost moving from intermittent to 24*7 water supply.
- Inadequate billing and collection mechanisms of water taxes reducing financial sustainability.

Institutional and governance challenges

•Regulatory gaps in groundwater use, water quality, and metering.
•Poor coordination between multiple agencies involved in water supply.
•Lack of skilled workforce to support the transition to daily water supply systems.

WHY 24*7 WATER SUPPLY ?

- **24*7 Water supply means that every consumer will get water at full pressure twenty- four hours a day and seven days a week.**
- This ensures reliable access to water with other added benefits.

So most of the countries major programmes such as JNNURM , AMRUT & Smart City Mission recommend it as a criteria for a water supply project. Also a prerequisite for 24*7 is NRW reduction & it enables effective cost recovery.

BY DESIGN

- Adequate supply
- Timing
- Continuous Pressure / Pressure Management
- Volumetric charging

→ Better Services To All Individuals

→ Enables better Supply – Demand Management

- Leakage Management
- Reduces Transmission losses
- Decreases wastage stored water

→ Improve Operational efficiencies

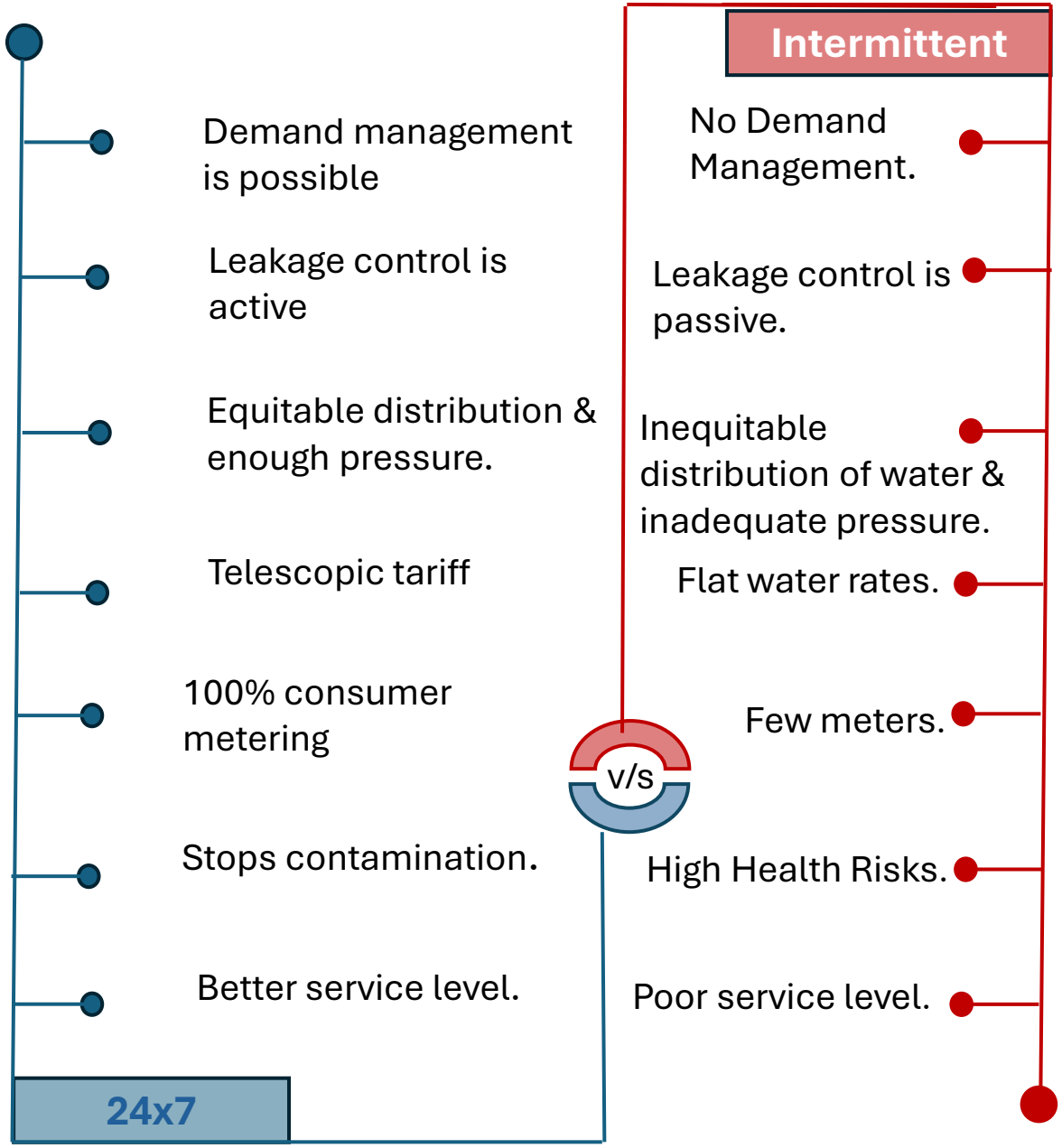
→ Reduces burden on water resources

Source : FEASIBILITY OF 24x7 WATER SUPPLY | CEPT - Portfolio

BENEFITS OF 24*7 WATER SUPPLY

Indicator	National Benchmark
WATER SUPPLY	
1. Coverage of Water supply connections	100 %
2.Per capita availability of water at consumer end	135 lpcd
3. Extent of metering of water connections	100%
4.Extent of Non revenue water	20%
5.Continuity of water supply	24x7
6.Adequacy of treatment & disinfection & Quality of water supplied	100%
7. Efficiency in redressal of customer complaints	80%
8.Cost recovery in water supply services	100%
9.Efficiency in collection of water supply related charges	90%

According to MoHUA guidelines for planning, Design & Implementation of 24x7 water supply system under AMRUT 2.0, **a 24x7 water supply** is achieved when **potable water** is supplied for 24 hours a day for 7 days in a week in adequate quantities with desired pressure,as per guidelines,at consumer's locations with quality assured.



Source : Ministry of Urban Development. Service Levels in Urban Water and Sanitation Sector : Status Report (2010-2011)

AIM & OBJECTIVES

A I M

Ensuring **safe, equitable and reliable 24*7** water supply

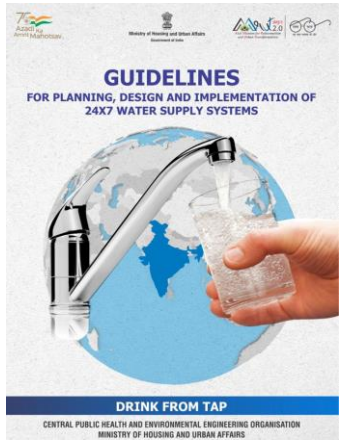
1. Review of transition from intermittent to 24*7 water supply

2. **To assess the performance and limitations of the existing intermittent water supply system in Ichalkaranji**, focusing on infrastructure, service delivery, equity, efficiency, and user satisfaction.

3. To evaluate and develop context-specific technical, financial, and institutional strategies for the phased implementation of 24x7 water supply in Ichalkaranji, with a focus on system efficiency.

METHODOLOGY OF RESEARCH

Literature Review



- Review good and failed practices across Indian and international cities and water development boards.
- Review policies and guidelines from Indian water development boards, municipal acts.

Field Based Assessment

MALAKPUR

ICHALKARANJI

- Conduct site visits to evaluate infrastructure, operational efficiency, and distribution systems.
- Identification of key challenges and gaps in the site city.
- Evaluate gaps in technical, financial, and institutional capacities

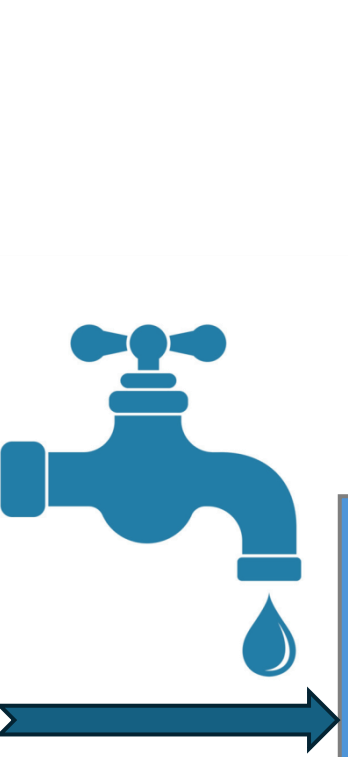
Stakeholder Consultation

- Engage with ULB officials to gather insights on operations, budgets, and challenges.

Recommendations & Strategy

- **Preparation of framework** and strategies on how to shift from intermittent to 24*7.
- **Policy Reforms:** Recommendations for municipal regulations and financial models.
- **Community Engagement:** Campaigns to educate the public and secure buy-in.

POLICY, ACT,SCHEME AND MISSIONS



1993
Accelerated Urban Water Supply Programme (AUWSP)

2004
Karnataka Urban Water Sector Improvement Project (KUWASIP)

2005
JNNURM

2009
National Rural Drinking Water Programme (NRDWP)

2012
Nagpur 24x7 Water Supply Project

National Water Policy

2015
AMRUT 1.0

Smart Cities Mission

Jalyukt Shivar Abhiyan (Maharashtra)

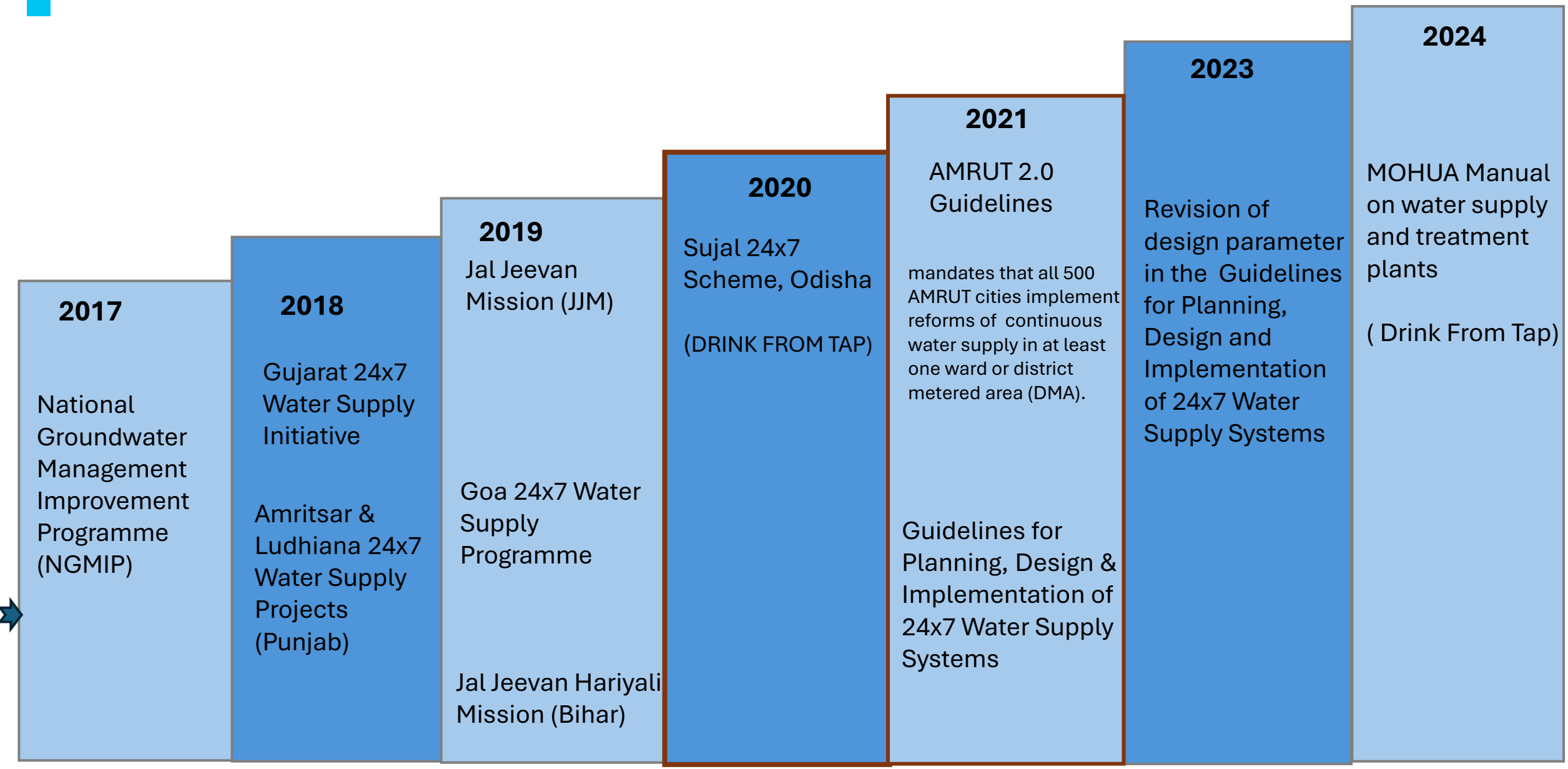
2016
Model Guidelines for Urban Water Supply & Sewerage Management

Mission Bhagiratha (Telangana)

Delhi Jal Board's Continuous Water Supply Initiative

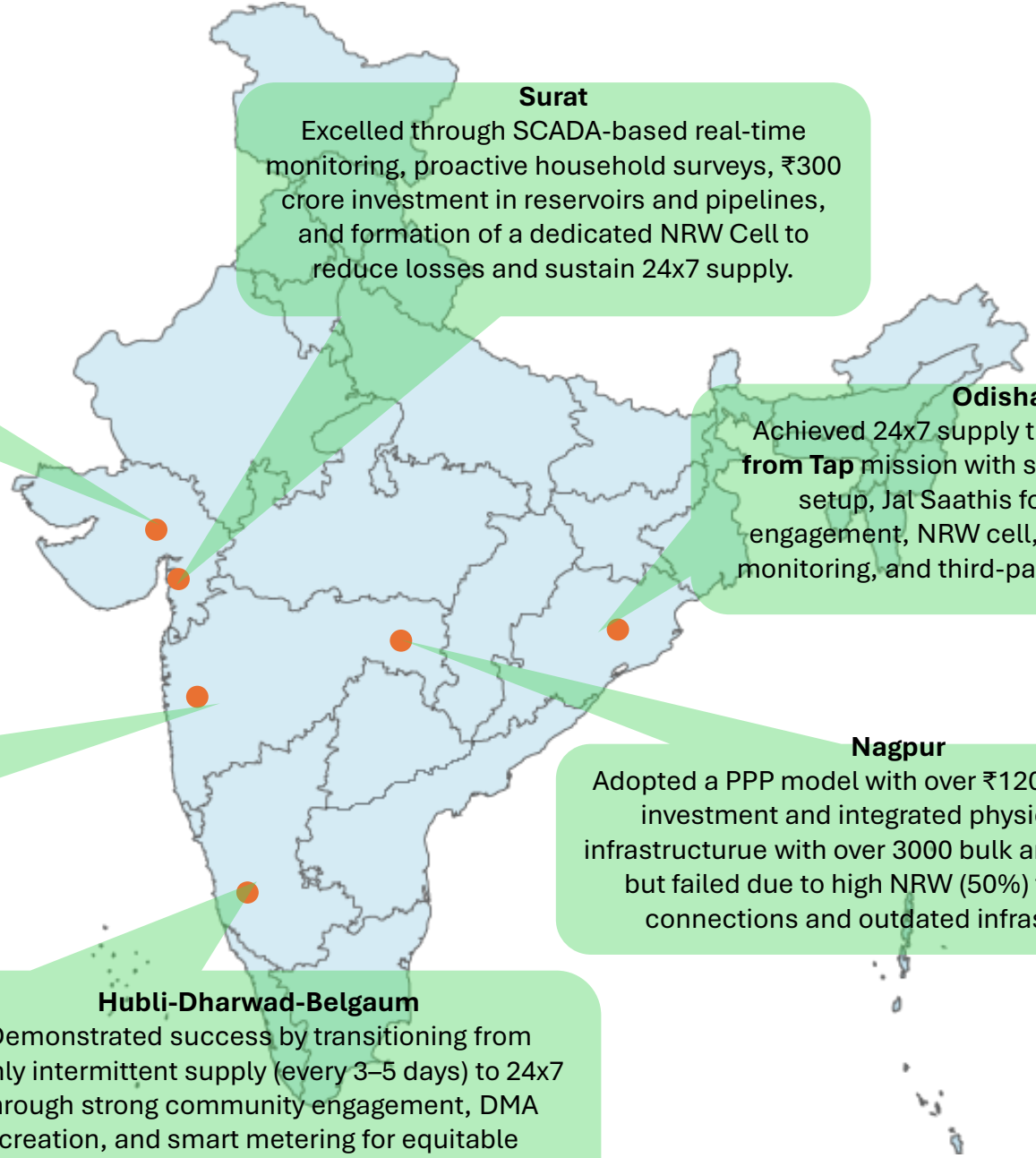
Source: Addendum to the "Guidelines for Planning, Design and Implementation of 24x7 Water Supply Systems" Published in December, 2021

POLICY, ACT,SCHEME AND MISSIONS



Source: Addendum to the "Guidelines for Planning, Design and Implementation of 24x7 Water Supply Systems" Published in December, 2021

CASE STUDIES- INDIAN



Surat
Excelled through SCADA-based real-time monitoring, proactive household surveys, ₹300 crore investment in reservoirs and pipelines, and formation of a dedicated NRW Cell to reduce losses and sustain 24x7 supply.

Ahmedabad
Used hydraulic modeling, DMAs, and community engagement for network monitoring, but failed due to persistent NRW (35%) and growing urban water demand

Odisha
Achieved 24x7 supply through the **Drink from Tap** mission with strong institutional setup, Jal Saathis for community engagement, NRW cell, GIS & SCADA for monitoring, and third-party quality checks.

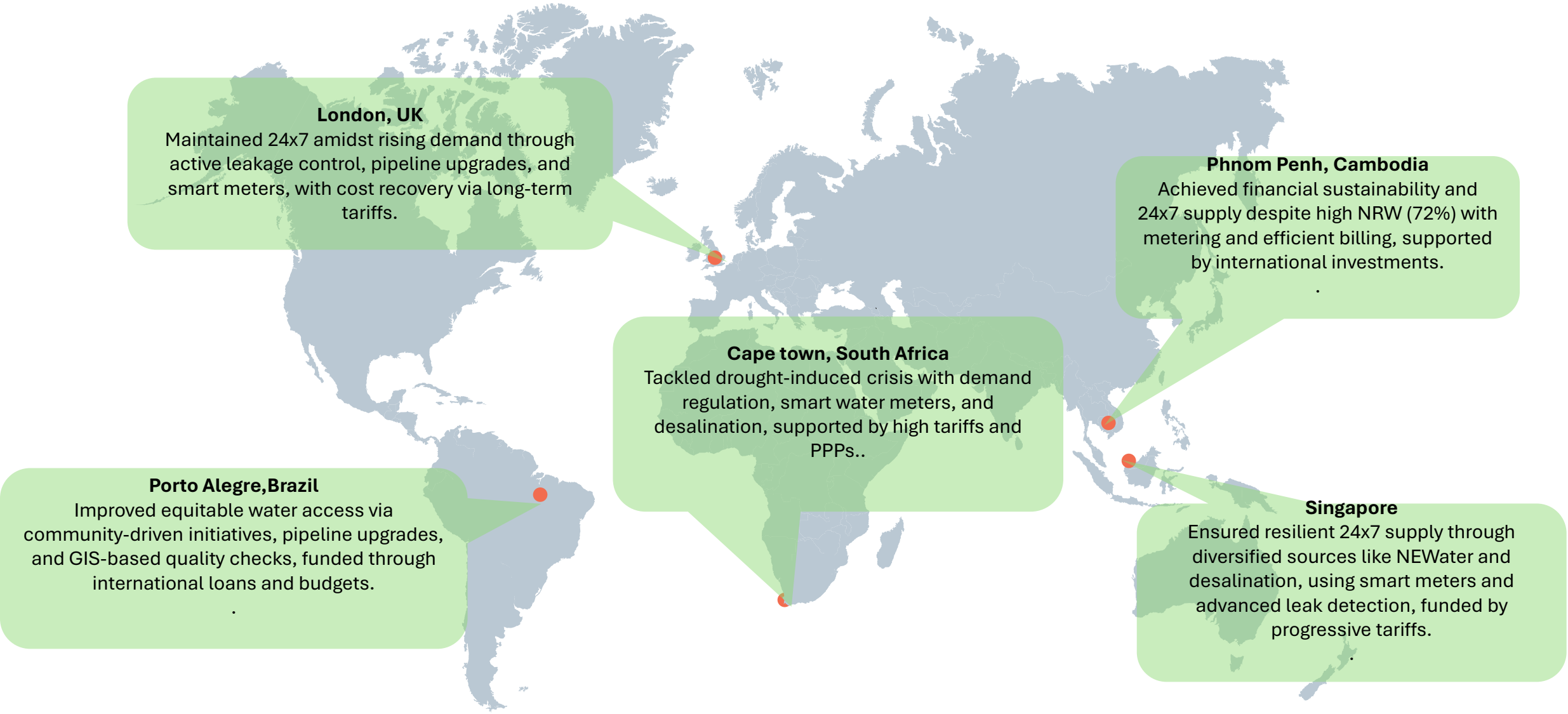
Badlapur
First to implement a privately managed 24x7 supply with performance-based monitoring contracts and grievance redressal, reducing financial risk and improving revenue.

Nagpur
Adopted a PPP model with over ₹120 crore private investment and integrated physical-digital infrastructurue with over 3000 bulk and HH meters, but failed due to high NRW (50%) from illegal connections and outdated infrastructure.

Hubli-Dharwad-Belgaum
Demonstrated success by transitioning from highly intermittent supply (every 3–5 days) to 24x7 through strong community engagement, DMA creation, and smart metering for equitable distribution, backed by ₹250 crore AMRUT funding.

Source : Nagpur Smart City initiative and government water supply projects; Data from Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC) Design of 24X7 water supply systems – A Case study: Ahmedabad city, A model for transforming an intermittent into a 24x7 water supply system August ,2007;AMRUT scheme documentation and SCADA implementation case studies in Gujarat.

CASE STUDIES- INTERNATIONAL



London, UK
Maintained 24x7 amidst rising demand through active leakage control, pipeline upgrades, and smart meters, with cost recovery via long-term tariffs.

Phnom Penh, Cambodia
Achieved financial sustainability and 24x7 supply despite high NRW (72%) with metering and efficient billing, supported by international investments.
.

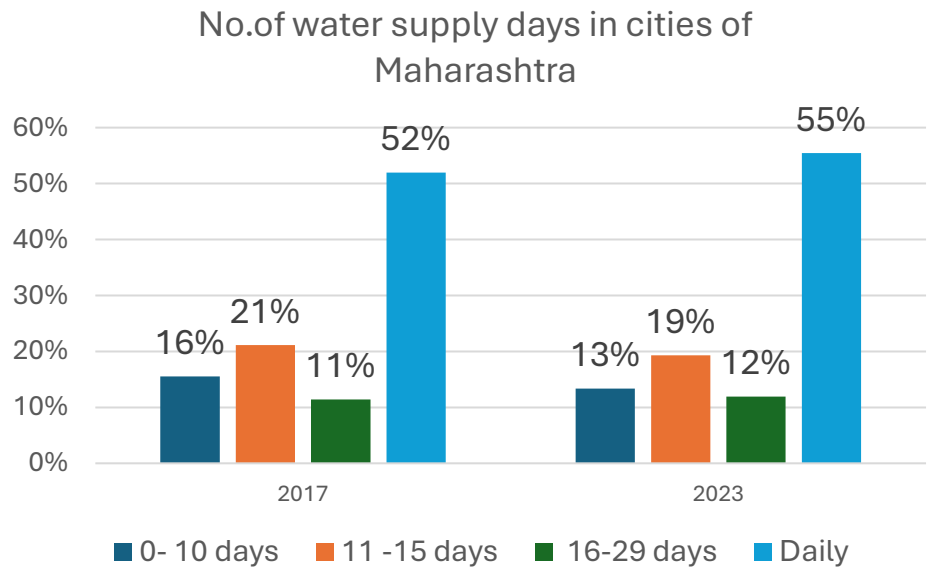
Cape town, South Africa
Tackled drought-induced crisis with demand regulation, smart water meters, and desalination, supported by high tariffs and PPPs..

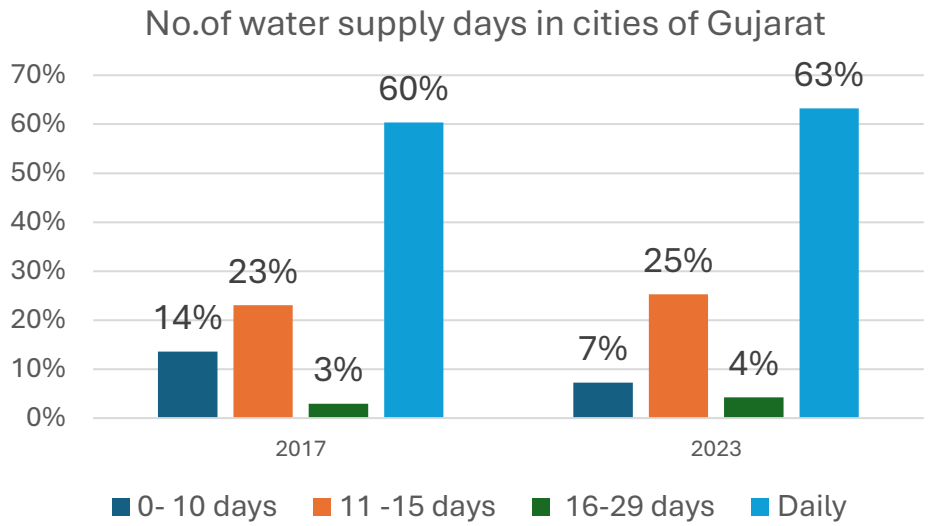
Porto Alegre,Brazil
Improved equitable water access via community-driven initiatives, pipeline upgrades, and GIS-based quality checks, funded through international loans and budgets.
.

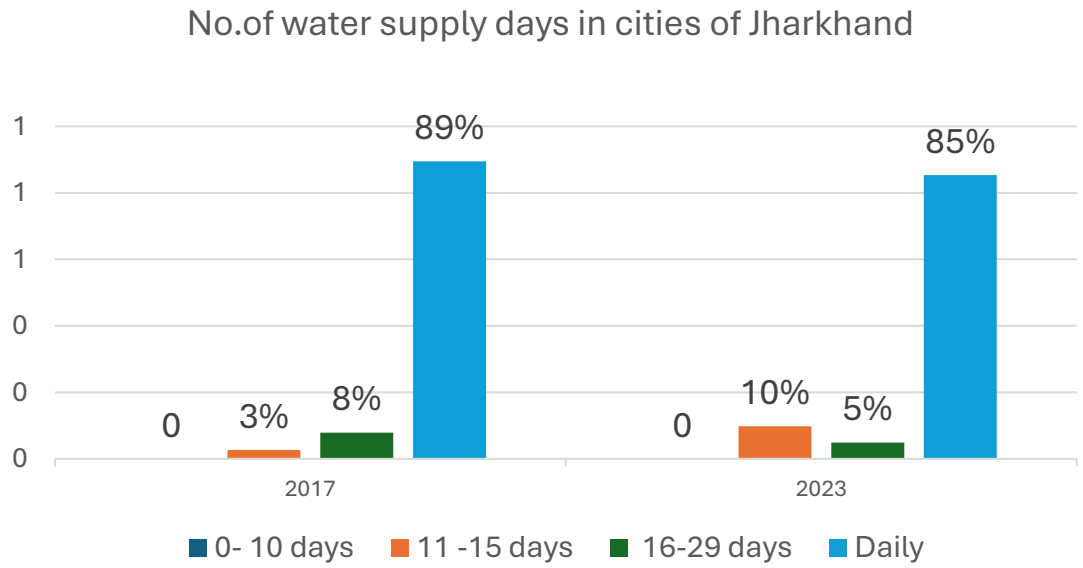
Singapore
Ensured resilient 24x7 supply through diversified sources like NEWater and desalination, using smart meters and advanced leak detection, funded by progressive tariffs.
.

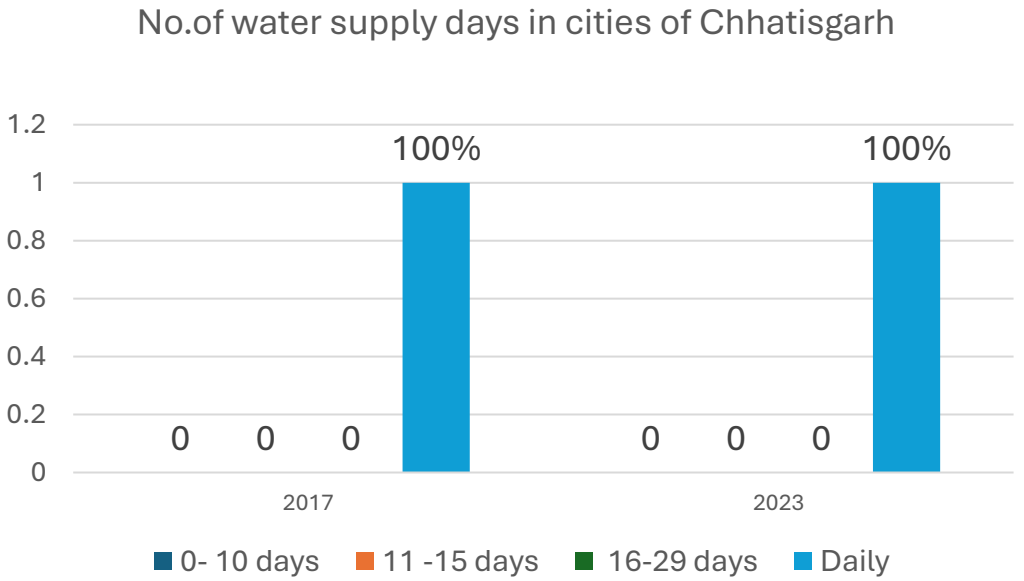
Source : Reports from Phnom Penh Water Supply Authority (PPWSA); Public Utilities Board (PUB) of Singapore reports, NIUA, Case studies from Porto Alegre Municipal Water and Sanitation; Thames Water Utilities reports and UK government publications on water management. Department; Reports from the World Bank on Cape Town's water resilience strategy.

INTERMITTENT SUPPLY STATE WISE ANALYSIS





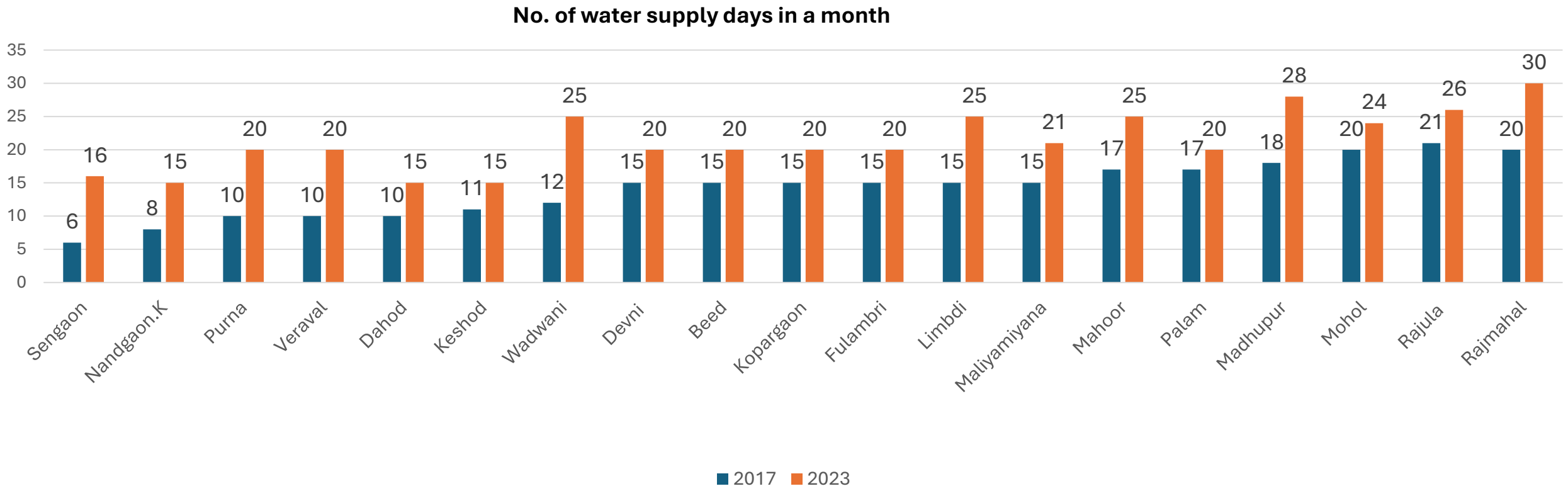




Inference : Inequity in urban water supply across Indian states.

Source : Author analysis CWAS PAS SLB 2023.

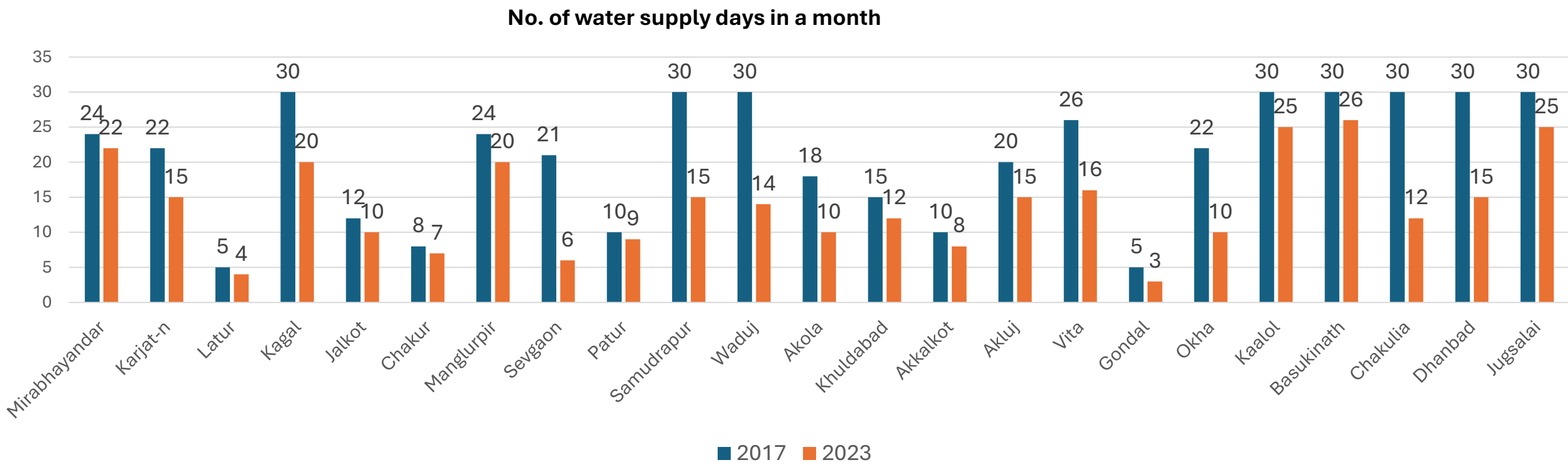
Improvement in Water Supply Frequency Across Indian Cities



Inference :Cities reflects targeted infrastructure upgrades under AMRUT 1.0 and 2.0 and policy interventions at state and city level aimed at improving urban water service reliability and reducing supply gaps..

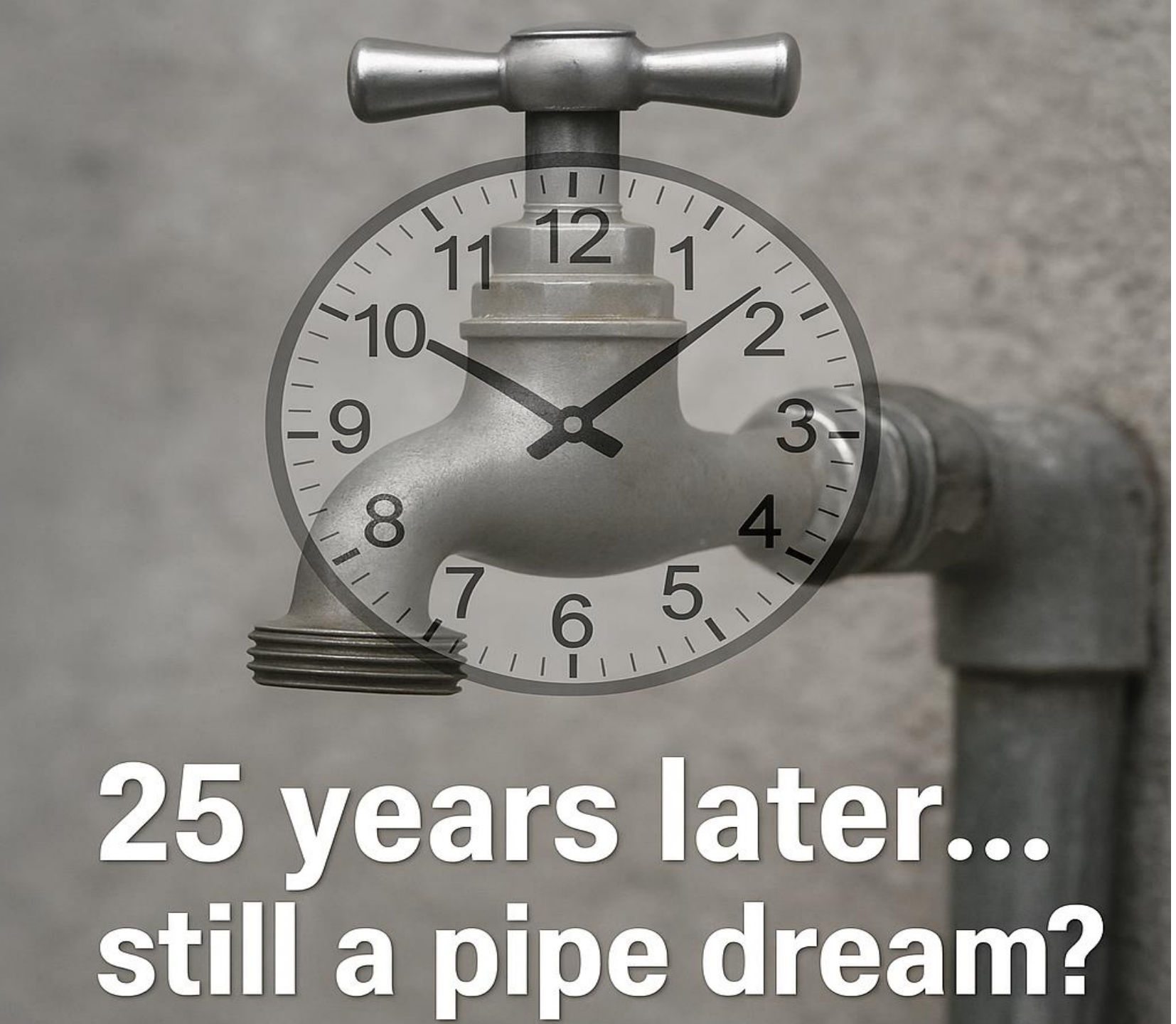
Source : Author analysis CWAS PAS SLB 2023.

Decline in Water Supply Days Across Cities



Inference : However, there is a decline in water supply days across cities in Gujarat and Maharashtra indicate challenges such as rising water demand, inadequate infrastructure maintenance, and stressed local water sources..

Source : Author analysis CWAS PAS SLB 2023.



Why has the promise of 24x7 water supply remained unfulfilled in many Indian cities—even 25 years after the concept was introduced—despite proven success in select pilot cities?

KEY REASONS

Legacy Infrastructure

&

Pilot Scaling Issues

Despite high service coverage, Ahmedabad has not shifted to 24x7 largely due to high NRW(35%) issues, poor metering, dual governance (AMC/AUDA), low DMA/SCADA coverage.

Nagpur is partially 24x7(Dharampeth zone), but expansion delayed due to land access, opposition to metering, and COVID-19 disruptions. Also people protested against new tariffs and meters; led to political pushback.

Cities like **Chakur , Akkalkot, Akluj and Samudrapur** face **frequent pump failures**, leakages, and poor power supply to water pumps. Urban expansion in Khuldabad , Mirabhayandar without infrastructure upgrade.

Water Source Gaps

&

High Capital Investment

Cities like Waduj, Patur, and Sevgaon rely on seasonal rivers or borewells, making supply vulnerable , leading to overdependence on single source.

Latur and surrounding Marathwada region suffered **repeated droughts** and poor monsoons.

Declared drought-hit repeatedly (2016, 2018, 2022).

Smaller ULBs (like **Waduj** or **Gondal**) operate with **minimal revenue** and **dependence on state funds. High capital cost** of retrofitting old infrastructure in old city areas with narrow lanes in Ahmedabad. Huge capital reqd laying tertiary networks in peri-urban areas , replacing aged pipelines in Nagpur

Source :*NITI Aayog Composite Water Management Index (CWMI), 2018 & 2023 Central Ground Water Board (CGWB) Reports ,*India Water Portal – Marathwada Drought Reports*, CAG Report on Urban Local Bodies in Maharashtra, 2022 , Water Supply Status Reports – MJP (Maharashtra Jeevan Pradhikaran) Census 2011 + Population Projections 2036 by MoHUA ,Maharashtra Economic Survey 2022-23,* Ahmedabad Municipal Corporation (AMC) Water Supply Report, 2022, NIUA Case Study – Governance Barriers to 24x7 water in Ahmedabad, Economic & Political Weekly (EPW), 2016 – Nagpur 24x7 Challenges. *ADB Impact Evaluation Report, 2021 Press Information Bureau (PIB) + Times of India (2020–2023). Hindustan times ,2016*

KEY REASONS FOR 24*7 WATER SUPPLY

24*7 WATER SUPPLY CITIES

Source : Reports from Phnom Penh Water Supply Authority (PPWSA); Public Utilities Board (PUB) of Singapore reports, NIUA, Case studies from Porto Alegre Municipal Water and Sanitation; Thames Water Utilities reports and UK government publications on water management. Department.

KEY REASONS FOR 24*7 WATER SUPPLY

Infrastructure & Network Improvements

- **Replacement of old pipelines** to reduce leaks and ensure efficient distribution.
- **Creation of District Metered Areas (DMAs)** to manage water supply in smaller, controlled zones.
- **Smart metering and SCADA systems** for real-time monitoring and automated control.
- **Upgrading water treatment plants (WTPs)** to meet the demand for round-the-clock supply.

Reduction of Non-Revenue Water (NRW)

- Detected and repaired leaks to prevent wastage.
- Regularized **illegal connections** and ensured **100% metering**.
- Improved billing accuracy for better revenue collection.

Institutional & Governance Reforms

- **Public-Private Partnership (PPP) models** approach.
- **Performance-based contracts** with incentives for efficiency improvements.
- **Regular water audits** to track and optimize usage.

Source : Reports from Phnom Penh Water Supply Authority (PPWSA); Public Utilities Board (PUB) of Singapore reports, NIUA, Case studies from Porto Alegre Municipal Water and Sanitation; Thames Water Utilities reports and UK government publications on water management. Department.

KEY REASONS FOR 24*7 WATER SUPPLY

Sustainable Water Source Management

- **Augmentation of water sources** through surface water, groundwater, and reservoirs.
- **Use of recycled water** for non-potable purposes to reduce demand on fresh water.
- **Increased storage capacity** to ensure uninterrupted supply during peak demand.

Financial Sustainability & Tariff Reforms

- Adjusted **tariffs gradually** for cost recovery.
- Provided **subsidies** to ensure affordability.
- Secured **government and donor funding** for infrastructure.

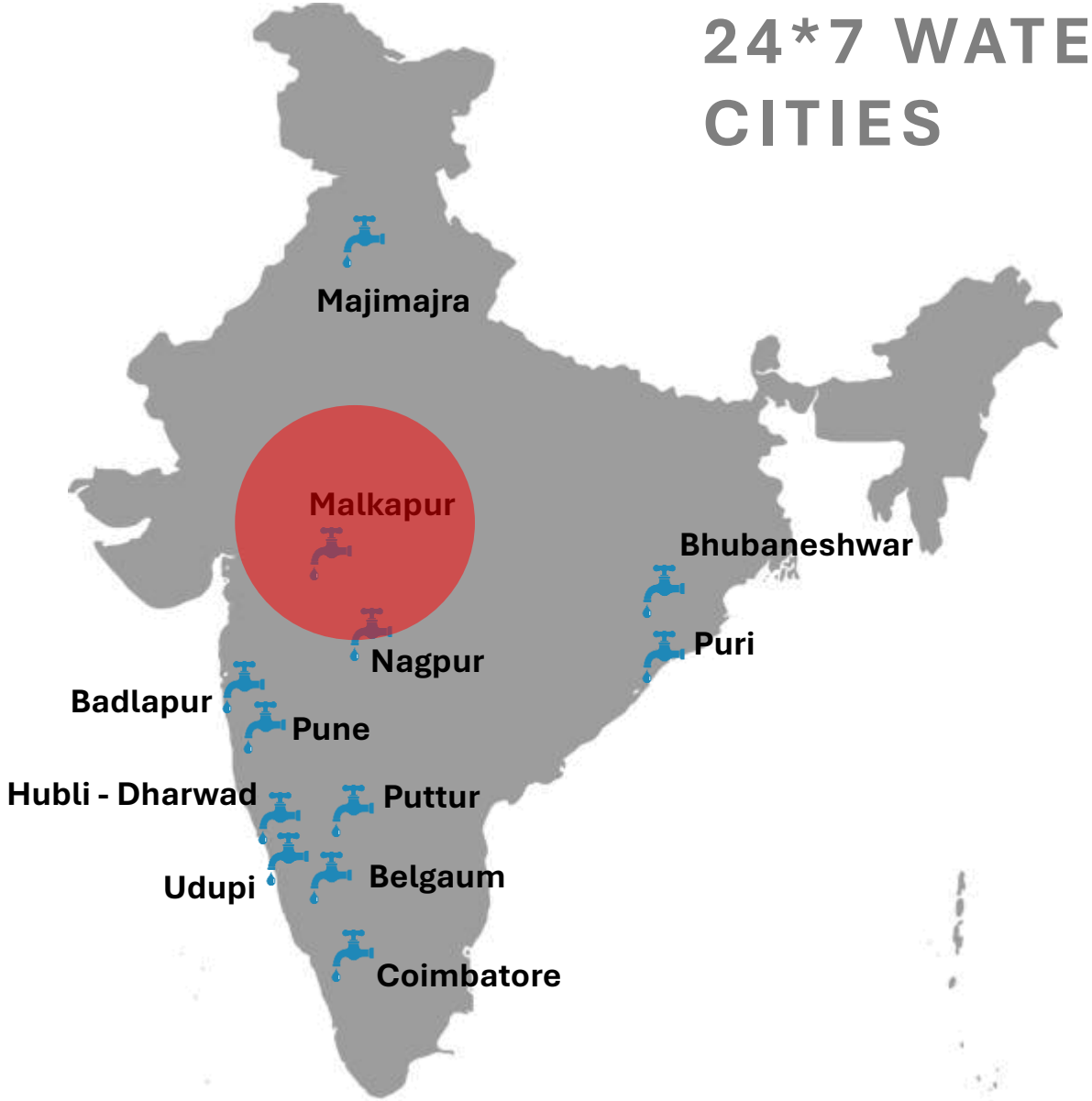
Public Awareness & Consumer Engagement

- Conducted **awareness campaigns** on conservation and reduce wastage of water .
- Set up **grievance redressal systems** for quick issue resolution.
- Engaged communities in **planning and decision-making**

Source : Reports from Phnom Penh Water Supply Authority (PPWSA); Public Utilities Board (PUB) of Singapore reports, NIUA, Case studies from Porto Alegre Municipal Water and Sanitation; Thames Water Utilities reports and UK government publications on water management. Department.

KEY REASONS FOR 24*7 WATER SUPPLY

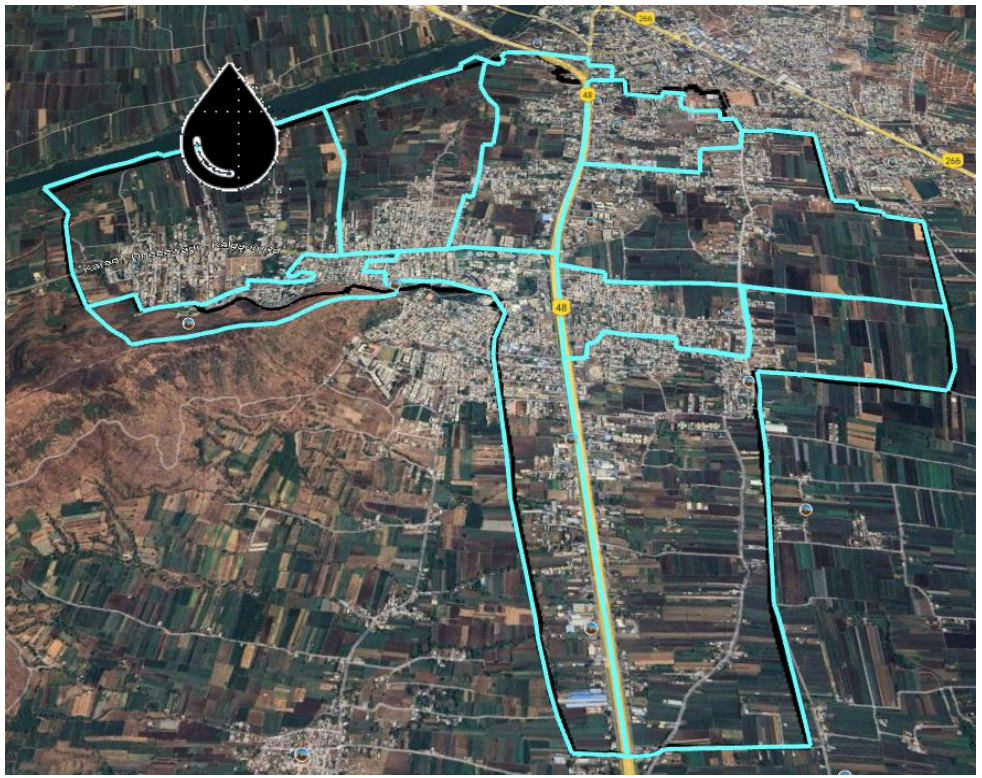
24*7 WATER SUPPLY CITIES



Source : Reports from Phnom Penh Water Supply Authority (PPWSA); Public Utilities Board (PUB) of Singapore reports, NIUA, Case studies from Porto Alegre Municipal Water and Sanitation; Thames Water Utilities reports and UK government publications on water management. Department.

CITY PROFILE – MALKAPUR

- Malkapur is a Nagar Panchayat in Satara district, Maharashtra, under the Pune division of Western Maharashtra.
- The town is located on NH-4, near the historical Agashiv Hills, on the boundary of Karad.
- It is **well known for sugarcane farming** and has gained recognition for being **the only town in Maharashtra with 24x7 water supply** to all households.



45000 Population (2025)

9.50 Area (Sq km)

9000 Households (2025)

4,725 per square mile Population Density

SLUM PROFILE

2,912 Population

398 Households

Source :Malkapur 24*7 water supply success scheme, Malkapur Nagarpanchayat

NEED OF 24*7 WATER SUPPLY IN MALKAPUR

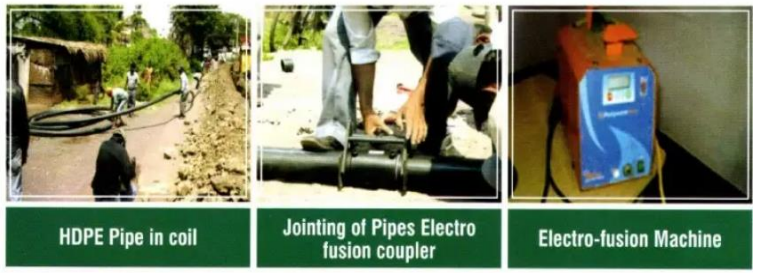
Pre-Project Scenario	Challenges Faced during implementing 24*7	Post-Project Scenario
Scheme for Malkapur & Nandlapur (1988)	Insufficient supply	Proposal for 67,196 population (by 2037)
Population: 14,000 (by 2010)	Population growth pressure	-Government approval sought
Source: Koyana River	Gram Panchayat demand for 24x7	Significant infrastructure improvements ike- laying new pipelines, installing valves, meters, or creating district metered areas (DMAs)
11 borewells	Koyana as sole perennial source	
Supply: 40 LPCD	Govt. proposal prep	

Koyana River

Laying of distribution system

Source :Malkapur 24*7 water supply success scheme, Malkapur Nagarpanchayat

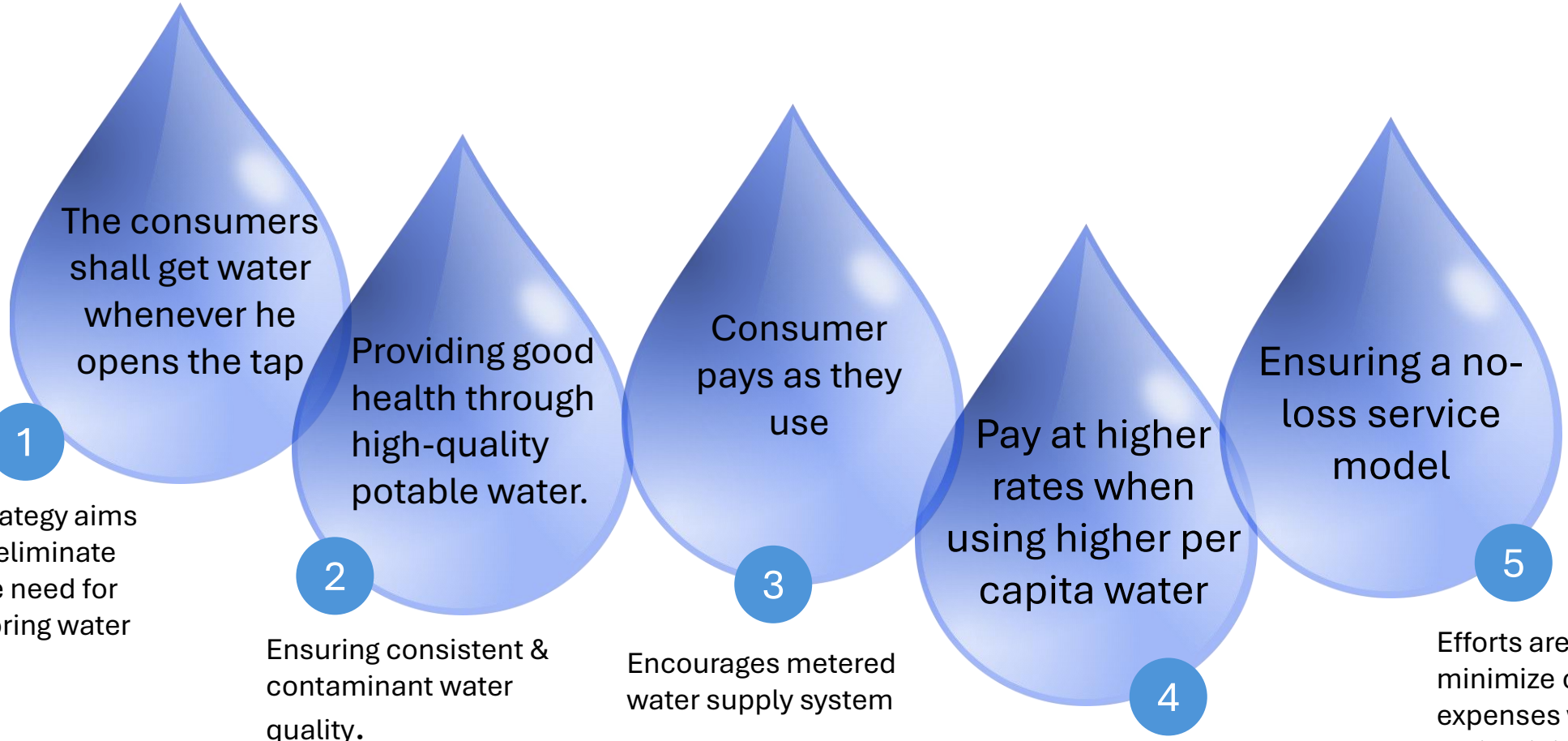
WTP 13 MLD @ present



Consumers connections with ferrule done using MDP pipes

INTERMITTENT TO 24*7 WATER SUPPLY

STRATEGY ADOPTED



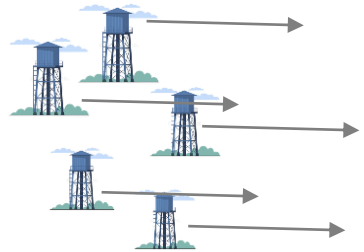
Source :Malkapur 24*7 water supply success scheme, Malkapur Nagarpanchayat

WATER SUPPLY CHAIN- SOURCE TO SINK

Source (Surface) → Water Treatment Plant → Water Distribution system → User End

1 Master Balancing Reservoir

Gravity



5 ESRs

1 water sources

14 MLD extraction

Koyana river **(7.1 km from WTP)**

30 Years

13 MLD

Treatment capacity

13 MLD Utilized

12 hours daily working

6 zones with

5 ESRs

1 Master Balancing Reservoir

Pipeline Network: **90 Km**

Area Covered **: 9.5 Sq.km.**

180 **LPCD**

100% **connections**

24 **hours a day**

NO borewell dependency

Source :Author Malkapur Nagarpanchayat

MALKAPUR 24*7 SUCCESS STORY- TECHNICAL MODEL

Innovative material & equipments used:

- Pipes used in distribution network are of PE 100
- Connections with electro fusion welded PE tapping tees
- **Use of Ferrules & Single-Length MDB Pipes** from the ferrule to household connections ensured leak-proof connections in the piping
- **100% AMR** Water meter, read with drive by system
- Automation of pumps

Consumer end Water metering in Malakapur

1 → ESR
2 → Settling Tank
3 → MNP Model
4 → Control Panel/ Automation

Strong will power of the

Political and Administrative wing

of the Nagar Panchayat was observed. Vise President Mr. Shinde actively supported in improvising water supply in the city including 100 % metered 24X7 system with water rates on volumetric basis.

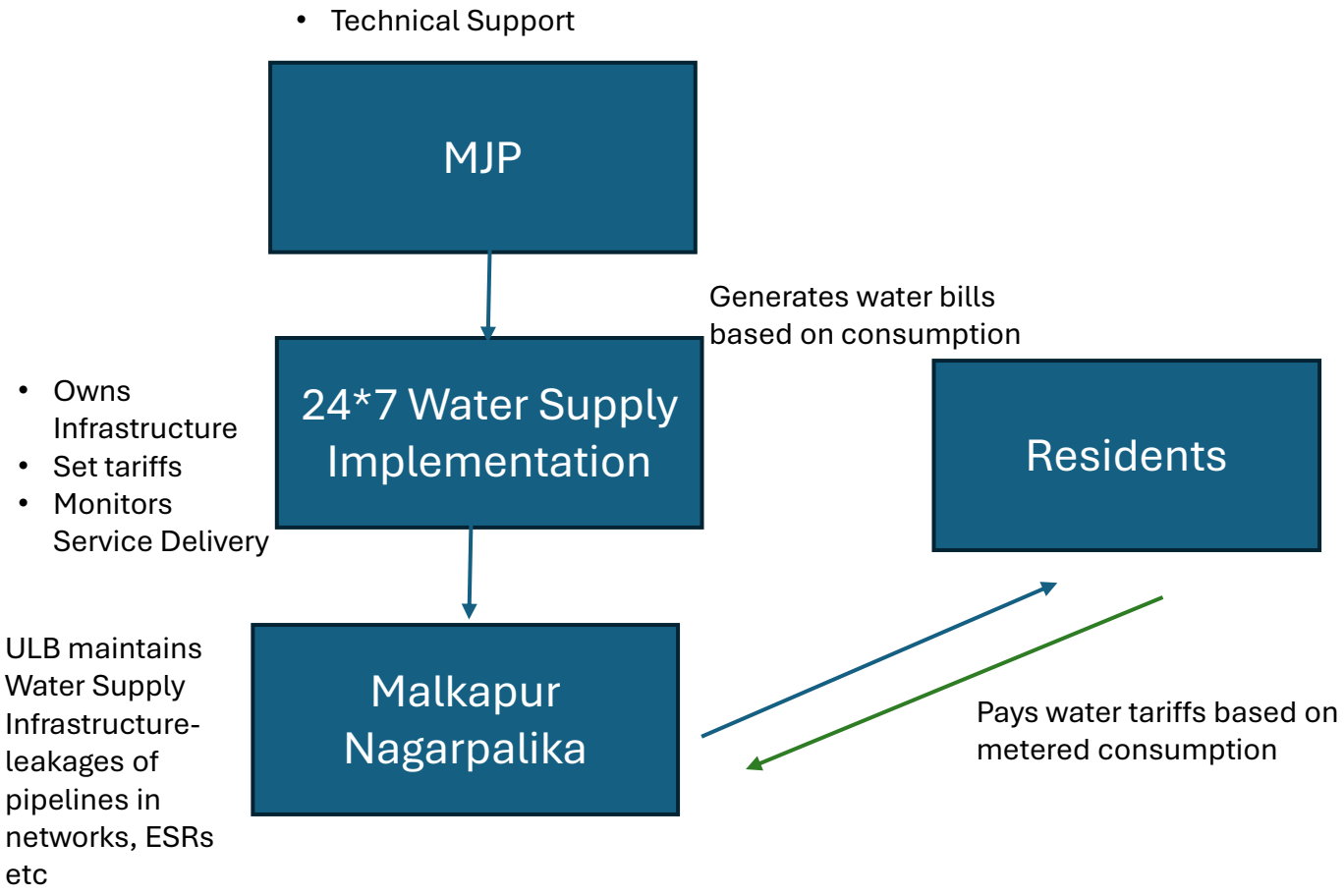
Achievements Of MNP for 24X7 Water Supply Scheme

Prime Ministers Award 2010
National Urban Award 2011
MEDA Award 2013

Source :Malkapur Data Verification Report CWAS, Malkapur 24*7 water supply success scheme, Malkapur Nagarpanchayat,

PPP(Public Politics Prashasan) MODEL APPROACH for 24*7 IMPLEMENTATION

- MJP supported technically in providing engg , did the estimation and **2 %** was paid by ULB to MJP

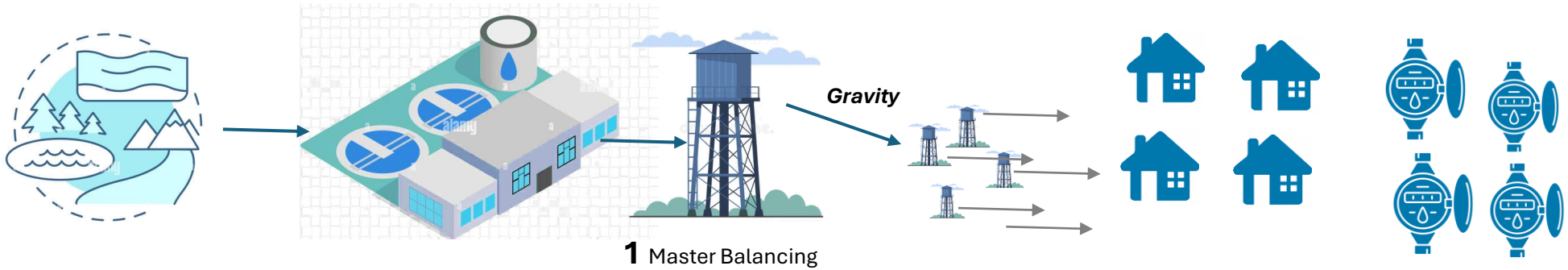


Stakeholder	Private Operator
MJP	Technical support for 24*7 implementation
Municipality (ULB)	Owns the water infrastructure, sets tariffs, and monitors service delivery. Operates and maintains the water supply system and ensures 24×7 service.
Residents	Pay water tariffs based on metered consumption and benefit from improved service.

- O&M is done by ULB itself but all the materials they require like chemicals or AMR meter for new connections it is done through tender process .

Source : Author-Primary Survey and discussion with Malkapur officials

PROJECT IMPLEMENTATION & MAINTENANCE – FINANCIAL MODEL



1 Master Balancing Reservoir

Infrastructure Upgradation

Capex : 90% State Govt. , 10% ULB , Total Project Cost: Rs.950 lakhs

Opex: ULB does the repairing of leakages, maintenance of infrastructure

Year	Demand (Rs.in Lakhs)	Collection (Rs. In Lakhs)	Collection (%)	Expenditure (Rs.Lakhs)	Cost recovery (based on revenue demand)
2020-21	260	213	82	197	132%
2021-22	272	232	86	218	125%
2022-23	272	236	87	223	122%
2023-24	266	233	88	222	120%

>100% cost recovery in water supply operations

Water Metering

Capex: Consumer- pays for 100% cost installation of meter and connection (approx. Rs.15,000)

ULB – documents verification and appoints vendor to install meter

Opex: ULB generates Water tax based on volumetric consumption on monthly basis

Water Bills

Source : Primary Survey and discussion with Malkapur officials

LEADING PRACTICE 24*7 WATER SUPPLY, MALKAPUR

Result Area	Pre project	Post Project
Timeliness	2 to 3 days alternate	24 x 7
Water quality	No guarantee	100% samples potable
Water saving	Before 100% metering 19 to 20 Hrs/ day pumping.	Pumping reduced to 13 – 14 Hrs. (30% saving) (540 ML/Y)
Energy saving	NA	3.30 lakh KwH / Annum electricity saved.
Reduction in O & M Cost	4 Pump operators, & 22 valve man. 3 Meter readers if ordinary meters.	2 Pump operators, & No valve man. No meter reader due to AMR.
N R W	Range in India 25 to 40%	9 – 12%
O & M Cost recovery	36%	100%
Water charges recovery	FY 2008-09 - Rs. 16 lakhs ~ <50%	88% **(2023-24)**
Consumer complaints	200 plus per month	0-1 per month. **(2023-24)**

Only ULB in Maharashtra having

24 X 7 Water Supply Scheme

With

100% Consumer Level Metering

Source :Malkapur 24*7 water supply success scheme, Malkapur Nagarpanchayat

MALKAPUR- BENEFITS POST 24*7 IMPLEMENTATION

At Consumer Level

- ✓ **High Consumer satisfaction**
- ✓ Direct rooftop tanks filling without motors , **saves electricity of 3.30 lakh units annually.**
- ✓ **No disconnection** for late bill payment.

At ULB Level

- ✓ **100 %** O&M cost recovery in water supply service.
- ✓ **Zero** Customer Complaints .
- ✓ **Metering cost paid by consumers** reducing financial burden on ULB
- ✓ Reduced waterborne diseases **>** Shutdown of **100** dispensaries

Environmental Benefits

- ✓ **30% Water Savings** – Continuous, pressurized supply minimizes leaks, reduces wastage.
- ✓ **20% Energy Savings** – Reduced pumping requirements & optimized distribution

KEY FINDINGS

Importance of ESR Design and Planning

Use of Ferrules and Single-Length MDB Pipes

Significance of Metering & Cost-Effective Billing

Use of RF Technology

Source : Primary Survey and discussion with Malkapur officials

ASSESSING WATER SUPPLY SYSTEM IN ICHALKARANJI

Source :Author

CITY PROFILE – ICHALKARANJI

Geographic Location :

29 km east of Kolhapur

10 km south-east of Hatkanangale railway station

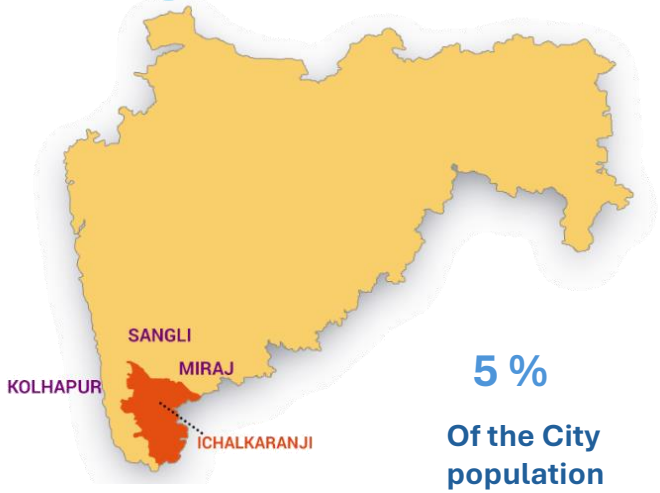
3,47,000
Population (2025)

29.64
Area (sq .Km)

67,892
Households (2025)

12,299 per square mile
Population Density

31
Wards



5 %
Of the City population

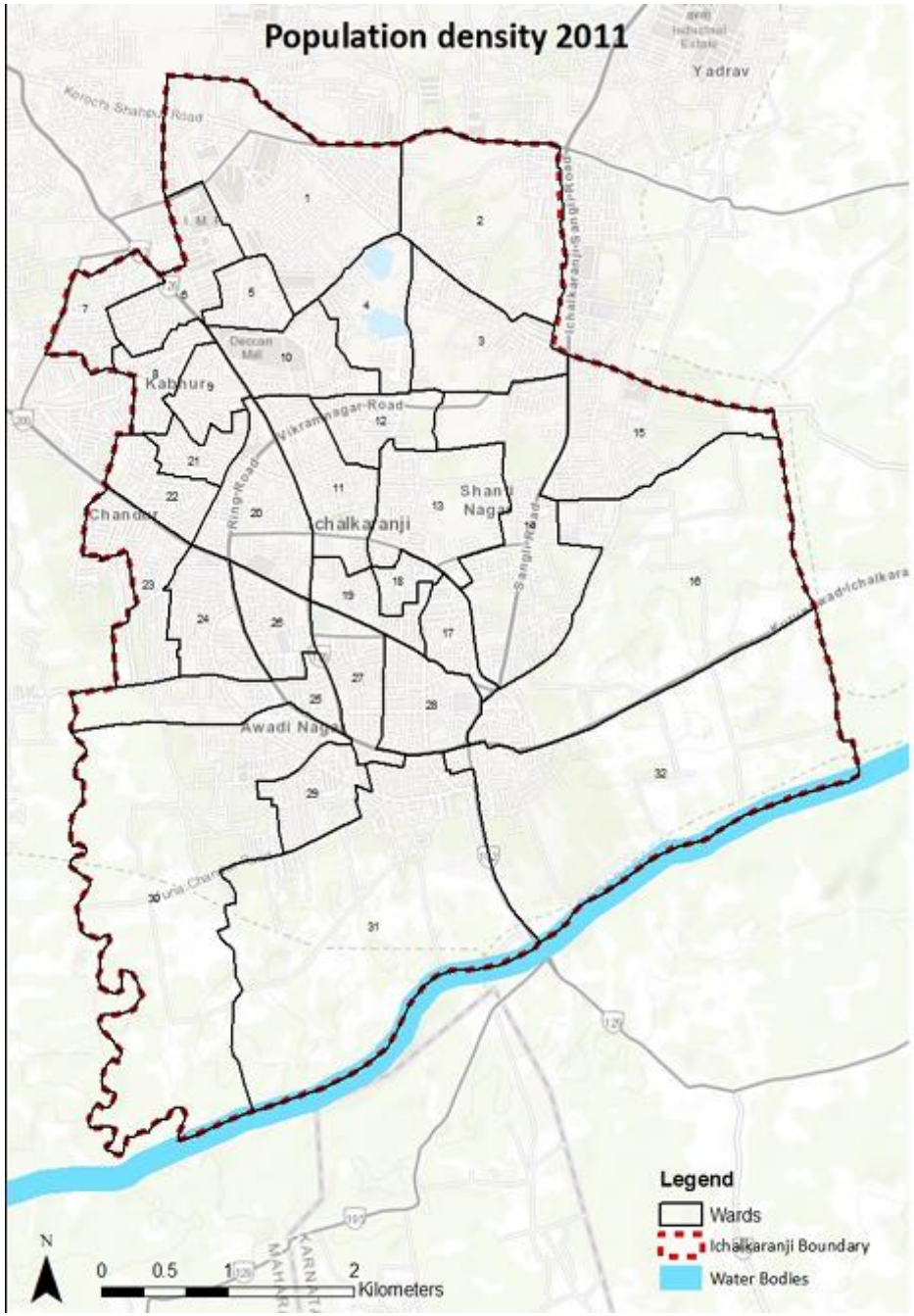
SLUM PROFILE

18883
Slum Population (2024)

4047
Slum Households (2024)

26
Slum Settlements

SLUMS
- NOTIFIED
  - 14 — Under IMC
  - 10 — Under Private Land
- NON NOTIFIED
  - 2



Source: Map - DKTE Society's, Textile and Engi. Institute, Ichalkaranji ; Ichalkaranji Municipal Corporation

WATER SUPPLY CHAIN – SOURCE TO SINK (ICHALKARANJI)

Source (Surface)

2 water sources

45 MLD extraction

Krishna river (18 km)

Panchganga river (4.5 km)

Water Treatment Plant

108 MLD

Treatment capacity

42 MLD Utilized

16 hours daily working

Water Distribution system

11 zones with

15 ESRs

2 under construction

Pipeline Network: **488 Km**

Area Covered **: 29.64 Sq.km.**

User End

80 LPCD

60% connections

1.5 hours every 2-3 days

HH level borewell dependency

- Rising main issues at the Krishna River.
- The Panchganga River has dried up 1–2 times, discharge of sewage waste.

Inadequate water < 135 LPCD .

Source : Stakeholder Consulation , IMC

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Source : Stakeholder Consulation , IMC

SOURCE: With increasing urbanization on north side ground water levels are varying from 12m to 24m respectively

Ground water

Bore Wells
6.8 MLD

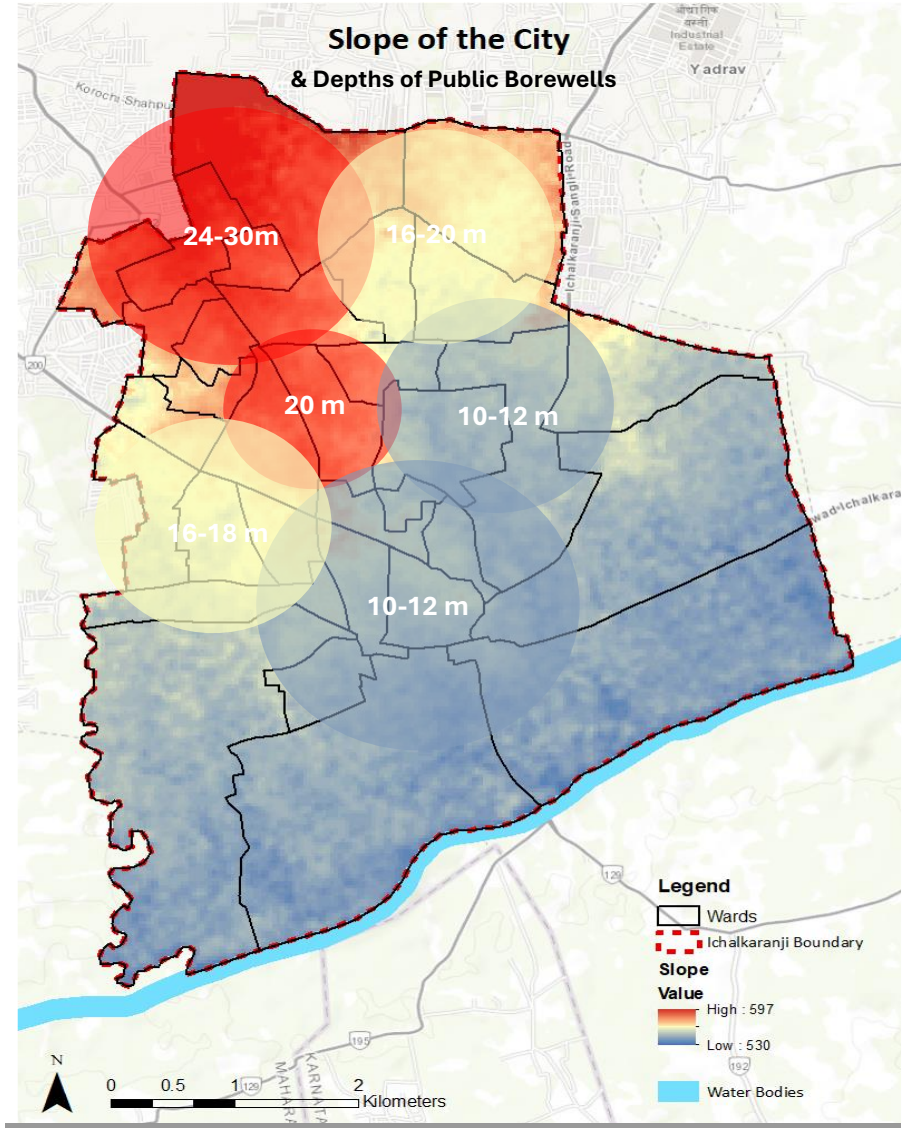
- There is a total of **1140 public borewells**
- **Ground water table levels** vary from **10 m to 24 m.**
- Presence of **high concentrations** of **iron, fluoride**, chloride, and nitrates due to use of fertilizers, **effluents from septic tanks**, sewage in open drains, industries.

48 borewells funded by Member of Parliament (MP)	**45 borewells funded by MLA**
5 borewells contributed by citizens	**252 Handpumps**

1042 borewells funded by ULB

- In last decade, 4-6 m **increase in depth of borewell** is observed in the northern part of the city.
- **No permission or restrictions** on **setting** up of private **borewells**.
- **No Recharge structures** in the city

At present, the existing water source does not meet the required supply capacity. The Ichalkaranji Municipal Council has **sanctioned the use of the Dudh Ganga River**, located 23 kilometers away, as a new source under AMRUT 2.0.



Depth of borewells in different parts

Source: : CWAS Climate Action Plan for Ichalkaranji and DRP Report by Rachana Kansagra

COVERAGE: 60% households with water supply connections receive 80 LPCD water supply with absence of metering

60% **Total 41,335 no. of HHs connections**

18% **Total 732 no. of slum HHs connections**

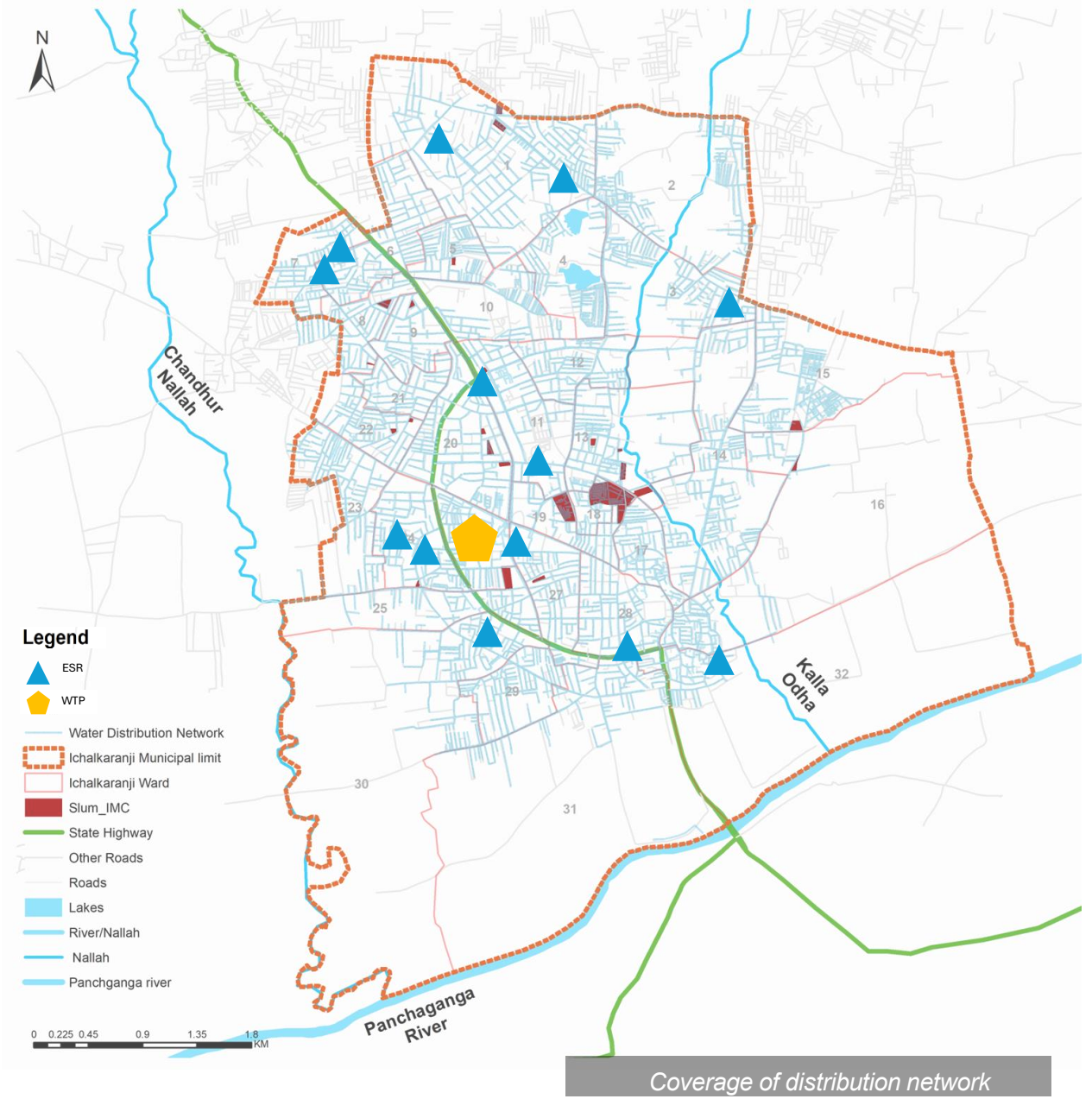
Rest are dependent on borewells

Number of individual water connections in slums	**732**
Number of functional standposts in slums	**80**

Once in 2-3 Days in a week; Once in 4 Days in a week – *In Summer*

Frequency of water Supply

- The **existing** water **supply** system is **insufficient** for the city due to water scarcity as Panchganga river water contamination has forced Ichalkaranji to stop lifting water during summer.
- **Metering** is completely **absent** at household level with water supply for average duration of 1 hour 30 min.

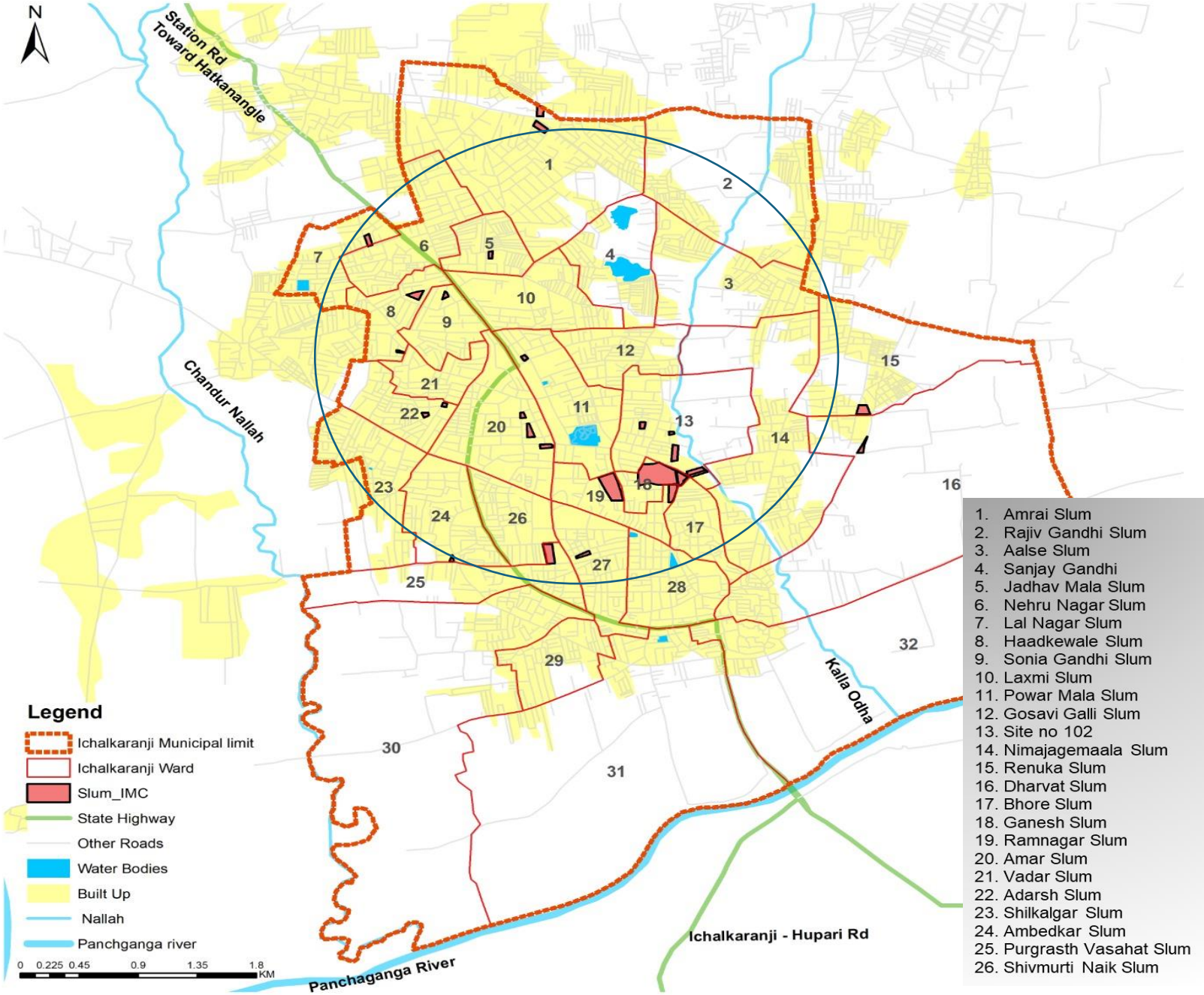


Coverage of distribution network

Source: : CWAS Climate Action Plan for Ichalkaranji

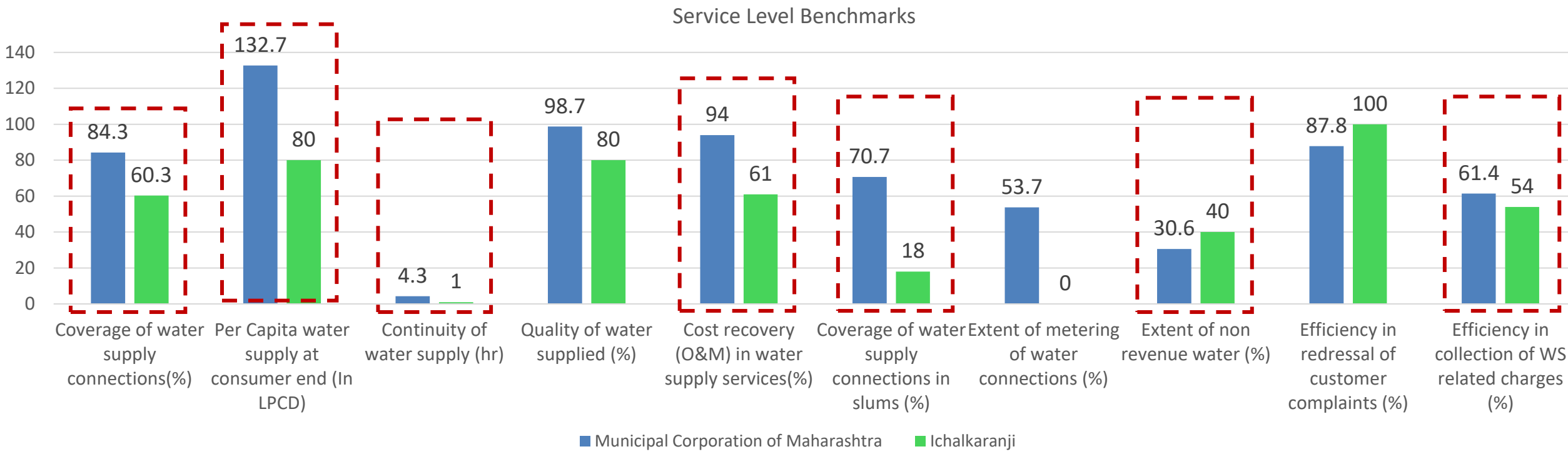
Irregular water supply timings lead to storage practices

- Water supply **on anytime** and on any day for **1-1.5 hr.**
- **Due to unresolved property tax issues** and the lack of formal ownership transfer, a majority of slum households are unable to access individual water supply connections.



Source: : CWAS Climate Action Plan for Ichalkaranji

WATER SUPPLY SERVICE LEVELS



- **Extreme intermittency** makes daily water availability highly unreliable, forcing residents to store water, which can lead to contamination.
- **Lower Per Capita Water Supply – 80 LPCD** Indicates an inadequate supply affecting hygiene and daily needs.
- **Extremely Low Water Supply Coverage in Slums** – Only **18% r**eflects inequitable water access, leaving vulnerable populations with poor-quality.
- **High Non-Revenue Water (NRW)** Losses Indicates substantial water loss due to leakage, theft, or unbilled consumption, reducing efficiency and increasing costs.
- **Weak Cost Recovery in Water Supply Services.**
- Low collection rates create financial instability **leading to service degradation**

Source : Author analysis based on PAS SLB , 2023

WATER FINANCE

Annual Water Supply Capital Expenditure

4108 lakhs

Annual Water Supply Revenue Expenditure

2324 lakhs

Annual Water Supply Revenue Income

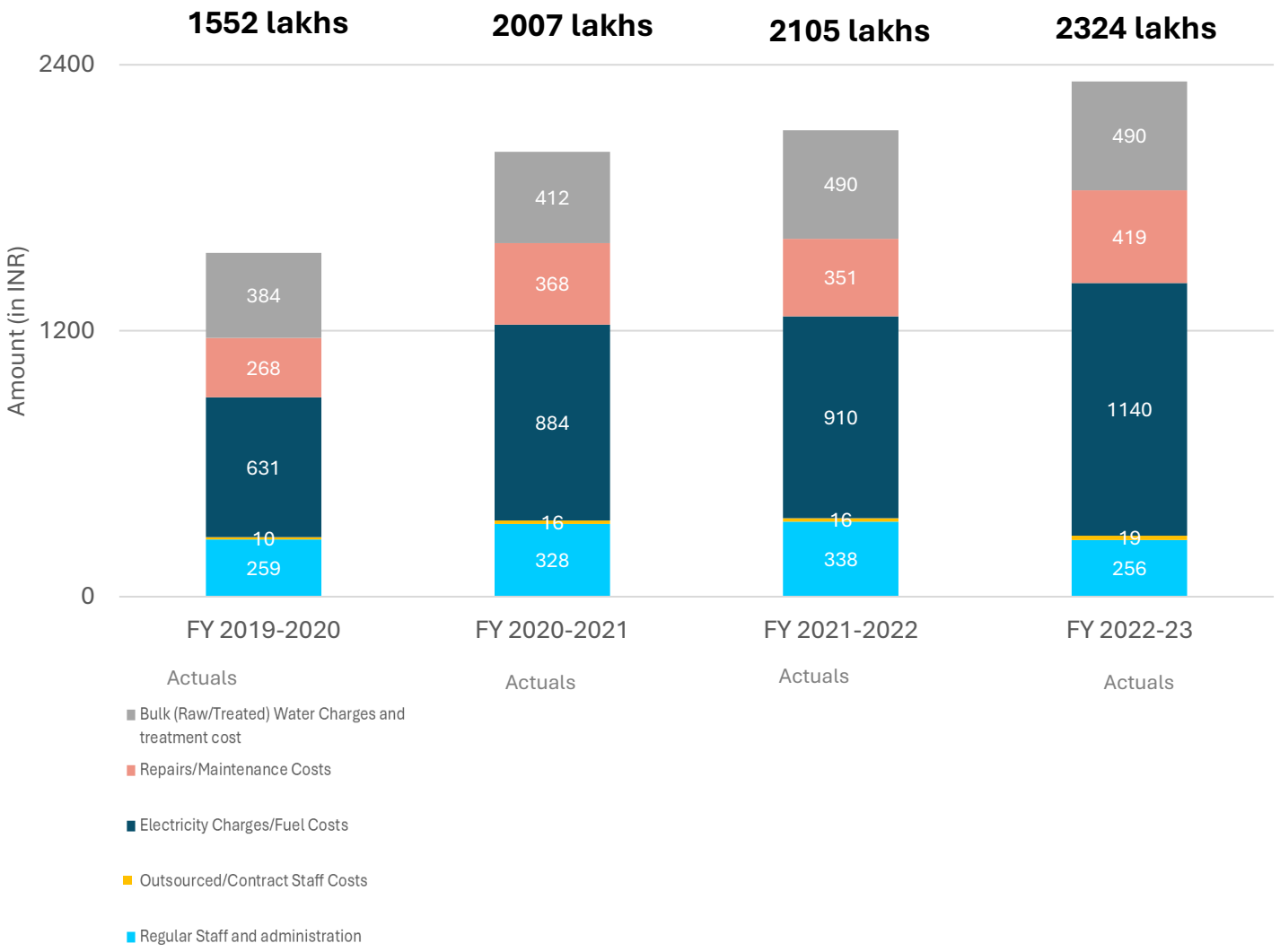
1420 lakhs

Water connection and tax charges in Ichalkaranji

Sr. No.	Connection type	Deposit (Rs.)	Attachment Fee (Rs.)	Excavation Fee (Rs.)	Rate (Yearly tax)
1.	Residential (½ Inch)	1000/-	80/-	270 (Upto 20ft)	1,800/-
2.	Residential (¾ Inch)	2000/-	120/-		3,450/-
3	Residential (1 Inch)	4000/-	150/-		8,250/-
3.	Industrial (½ Inch)	3600/-	80/-		8,060/-
4.	Industrial (¾ Inch)	7500/-	120/-		16,050/-
5.	Industrial (1 Inch)	16500/-	150/-		36,300/-

Source: Ichalkaranji MC, 2025; PAS SLB Report 2023

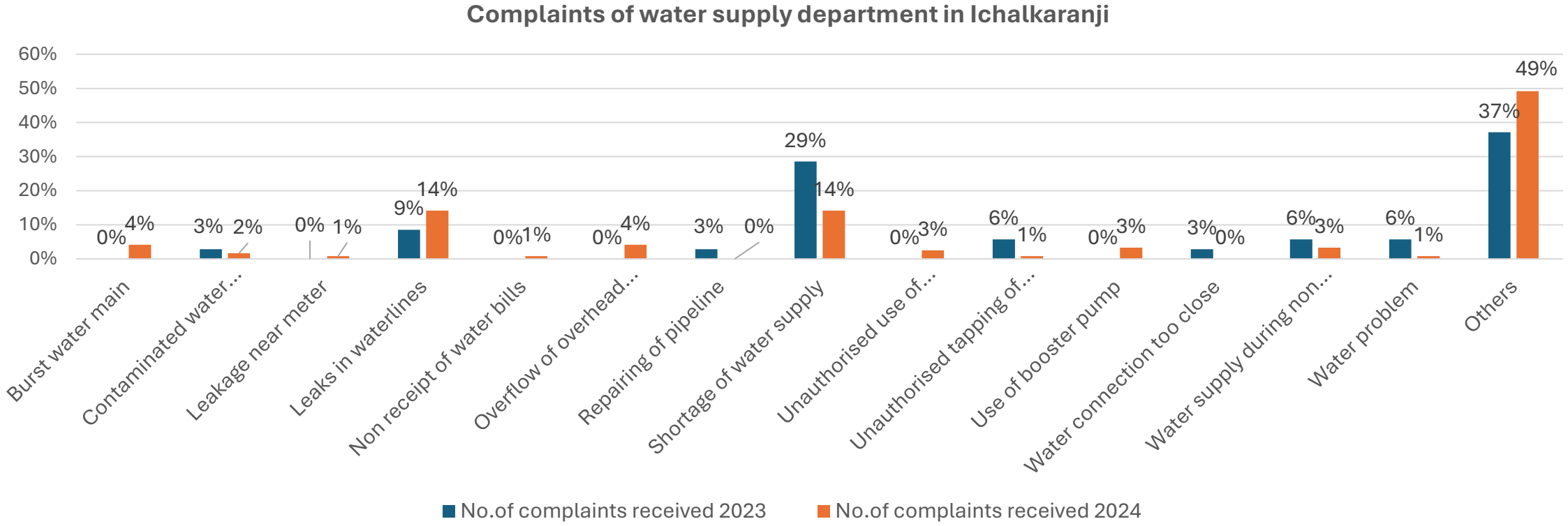
WHERE ICHALKARANJI SPENDING ON ITS WATER SUPPLY SERVICE?



- **Highest** water supply expense is on **electricity charges and fuel costs which has almost doubled in last four years.**
- The second highest expense is on **bulk water purchase and treatment and operations and maintenance** with Rs. 490 lakhs and Rs. 419 lakhs in FY 2022-23.
- The expense on **regular staff, administration and outsourced staff** has remained constant at Rs. 256 lakhs

Source:Ichalkaranji PAS SLB Data Ichalkaranji,2019-23

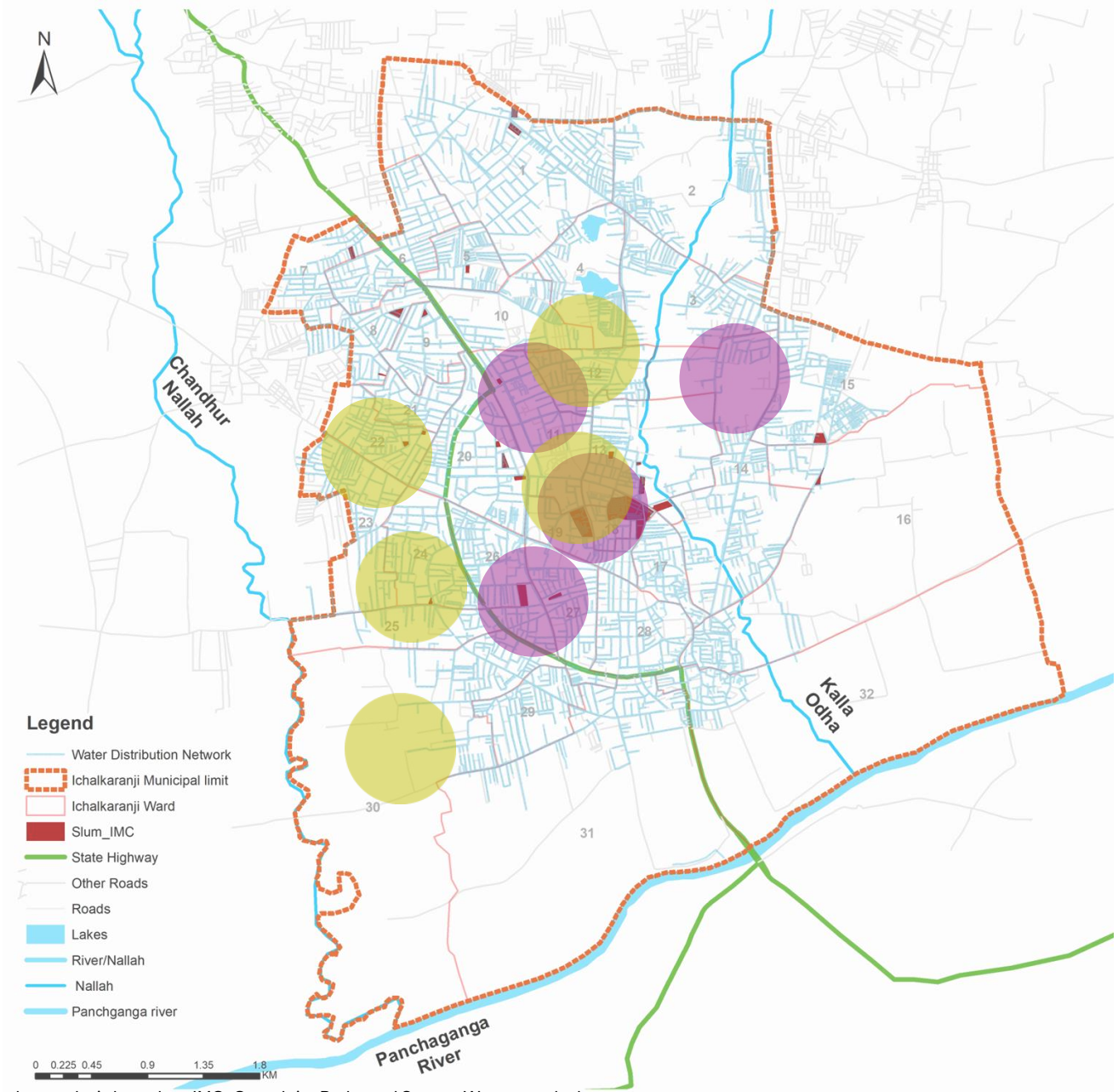
COMPLAINT REDRESSAL SYSTEM



- **"Others"** category has the highest complaints – Increased from **37% in 2023 to 49%** in 2024.
- Shortage of water supply was a major issue in 2023 (29% complaints) but reduced to 14% in 2024.
- Complaints about **leaks in waterlines** increased from **9% in** 2023 **to 14%** in 2024.This suggests a rise in pipeline deterioration, possibly due to aging infrastructure, poor maintenance.
- Non-receipt of water bills complaints rose from 9% in 2023 to 14% in 2024.
- New complaints emerged in 2024, such as **burst water mains, repair of pipelines, and overflow of overhead tanks**.

Source : Author analysis based on IMC ,Complaint Redressal System Water supply department

COMPLAINT REDRESSAL SYSTEM



- Leaks in waterlines
- Shortage of water supply

- **High concentration of complaints in central and northern Ichalkaranji**, indicating major water supply issues in these areas.
- **Densely populated zones** report more complaints, suggesting infrastructure stress and higher demand.
- **Water supply issues persist despite proximity to rivers and nallahs**, pointing to distribution inefficiencies.

Source : Author analysis based on IMC ,Complaint Redressal System Water supply department

WHAT PEOPLE WANT TO SAY?

"We do not receive enough water. There are huge problems in summer as we receive water only in 3-4 days"

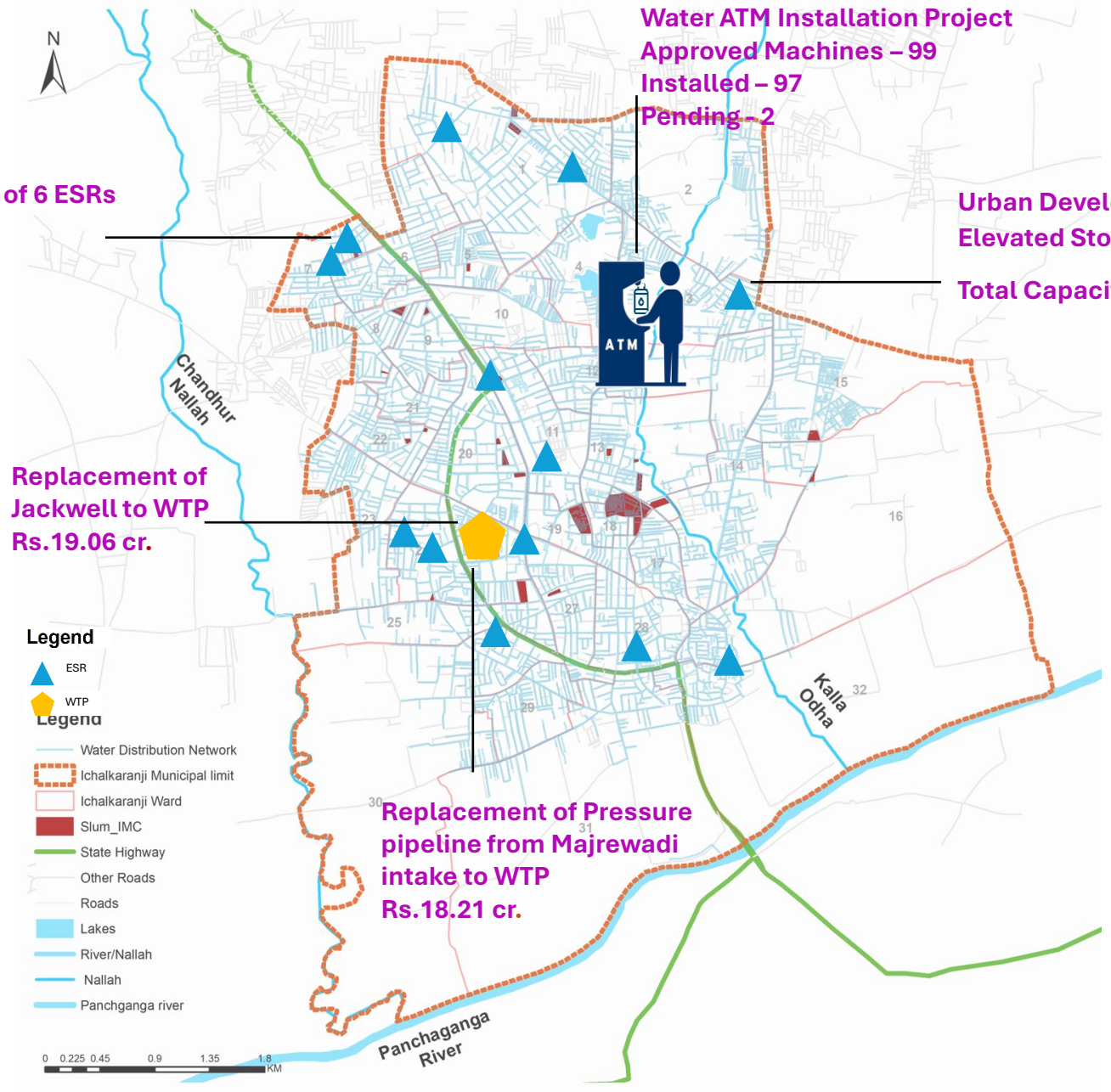
"Too many issues of leakages in system. We keep on filing complaint regularly for leakages in pipelines"

"We are ready to pay for the amount of water that we consume. But we should receive sufficient water"

"Water is received at a very low pressure. We do not receive enough water."

"We rely on borewells to meet our water needs"

ONGOING AND PROPOSED PROJECTS



Under AMRUT IMC is moving towards 100% water supply coverage with metering to minimize water losses

Source	Treatment	Storage	Distribution	User Ends
Activities conducted				
Total water extracted: 45 MLD	108 MLD treatment plant constructed 42% utilization rate	11 zone served by 15 ESRs	488 km pipeline network	• 80 LPCD water supplied • 50K connections • Approx. 1000 HH level borewell
Activities proposed				
	• Improving WTP utilization rate • Identifying water loses and water leakages in the system		• Pipe network covering entire city • Aiming to move from 80 to 135 LPCD water supply • Metering in residential and commercial area	

IMC is also conducting energy efficiency assessments by auditing the existing water supply system, aiming to reduce GHG emissions and implement climate mitigation activities

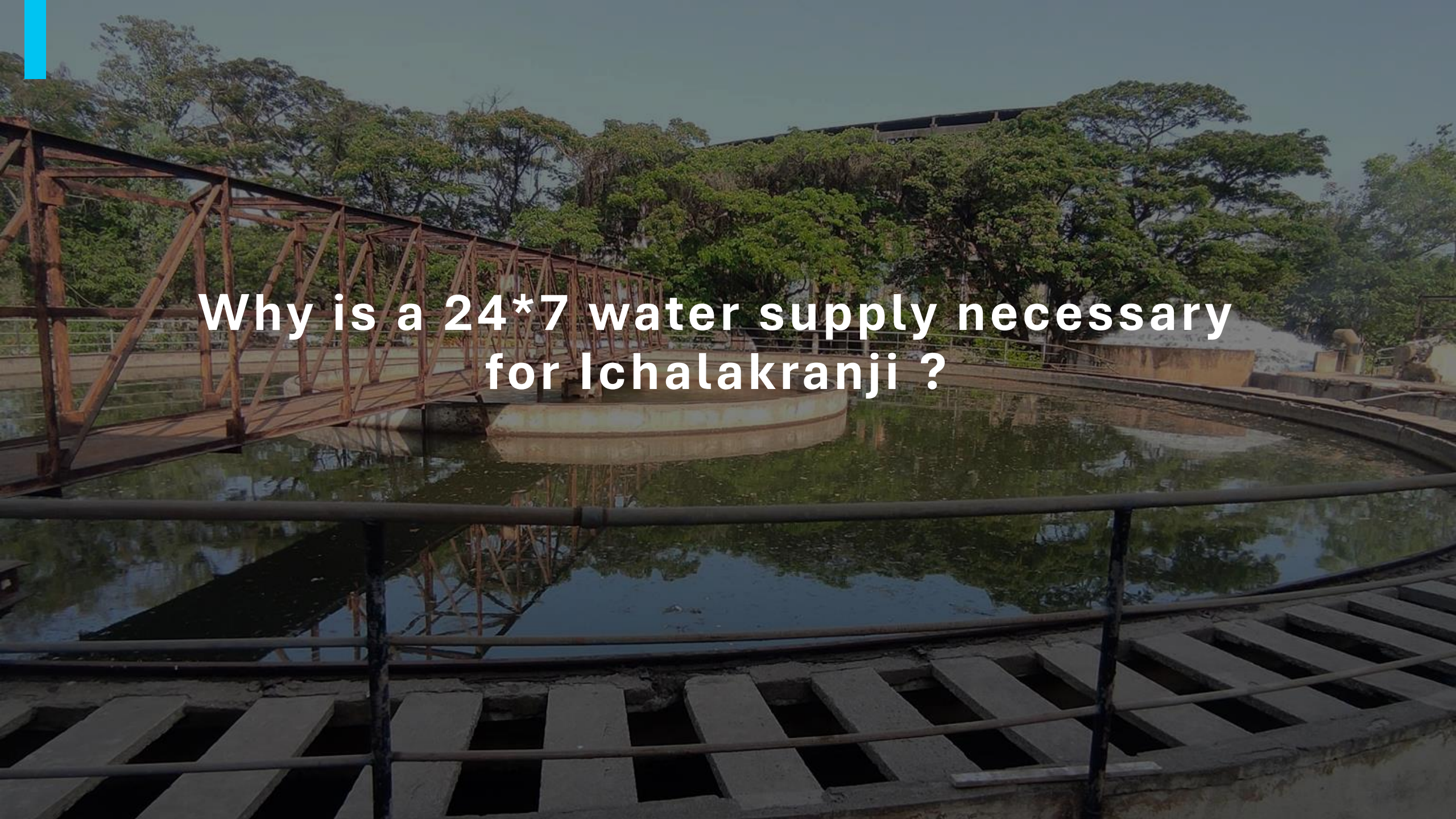

Intake well at Panchganga


Water treatment plant


ESR

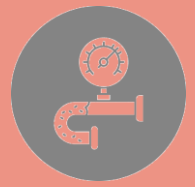
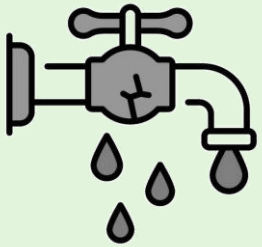
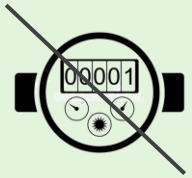
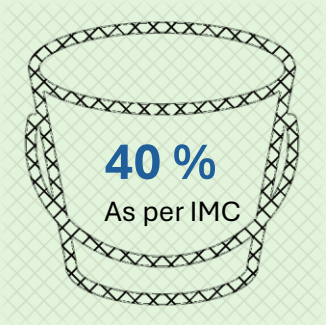

Distribution system

Source : Stakeholder Consulation , IMC



Why is a 24*7 water supply necessary for Ichalakranji ?

CURRENT ISSUES

ISSUES	Intermediate supply of 1.5 hours after every 4 days 	**NRW** 	**Pressure issue** 	**Absence of metering** 	**Financial challenge** 	**Infrastructure challenge** 	**Per capita water** 
IMPACT	Reliance on storage increases, leading to a higher risk of contamination, dependency on alternative sources.		Intermittent supply results in **uneven water pressure** leading to an **inequitable distribution of water**.	The absence of metering leads to **uncontrolled consumption, revenue loss, and difficulty in leakage detection**, resulting in high water wastage, poor cost recovery, and challenges in reducing Non-Revenue Water (NRW).	Funding gaps , delayed transition to 24x7 supply **making water supply systems unsustainable.**	Results in **frequent pipe leaks** and bursts, high water losses, **lack of advanced system (SCADA).**	Ichalkaranji Currently **supplies 101 LPCD** against the benchmark of 135 LPCD

ICHALKARANJI WATER SUPPLY vs MoHUA 24*7 STANDARDS

Parameter	MoHUA 24x7 Water Supply Standards	Ichalkaranji Existing System
Service Level Benchmark (SLB) Coverage (%)	100% Household Coverage	60.29%
Per Capita Supply (LPCD)	135 LPCD	80 LPCD
Design Period	30 Years	40 years old infrastructure
Land Required for Water Supply Infrastructure	City planners should earmark the land required for water supply infrastructure and its expansion at the ultimate stage in the master plan of the city for the next 30 years or more.	WTP & ESRs are 40 years old.
Water Supply Hours	24x7 Continuous Supply	Intermediate supply of 1.5 hours every 2-3 days
Water Tariff	Volumetric tariff with telescopic rate structure is mandatory	Flat Rate water tariff system
Peak Factor Hours	1.8-2.5	
Minimum Diameter of Distribution Pipes	100 mm for Class I cities , 80 mm for other cities	50 mm

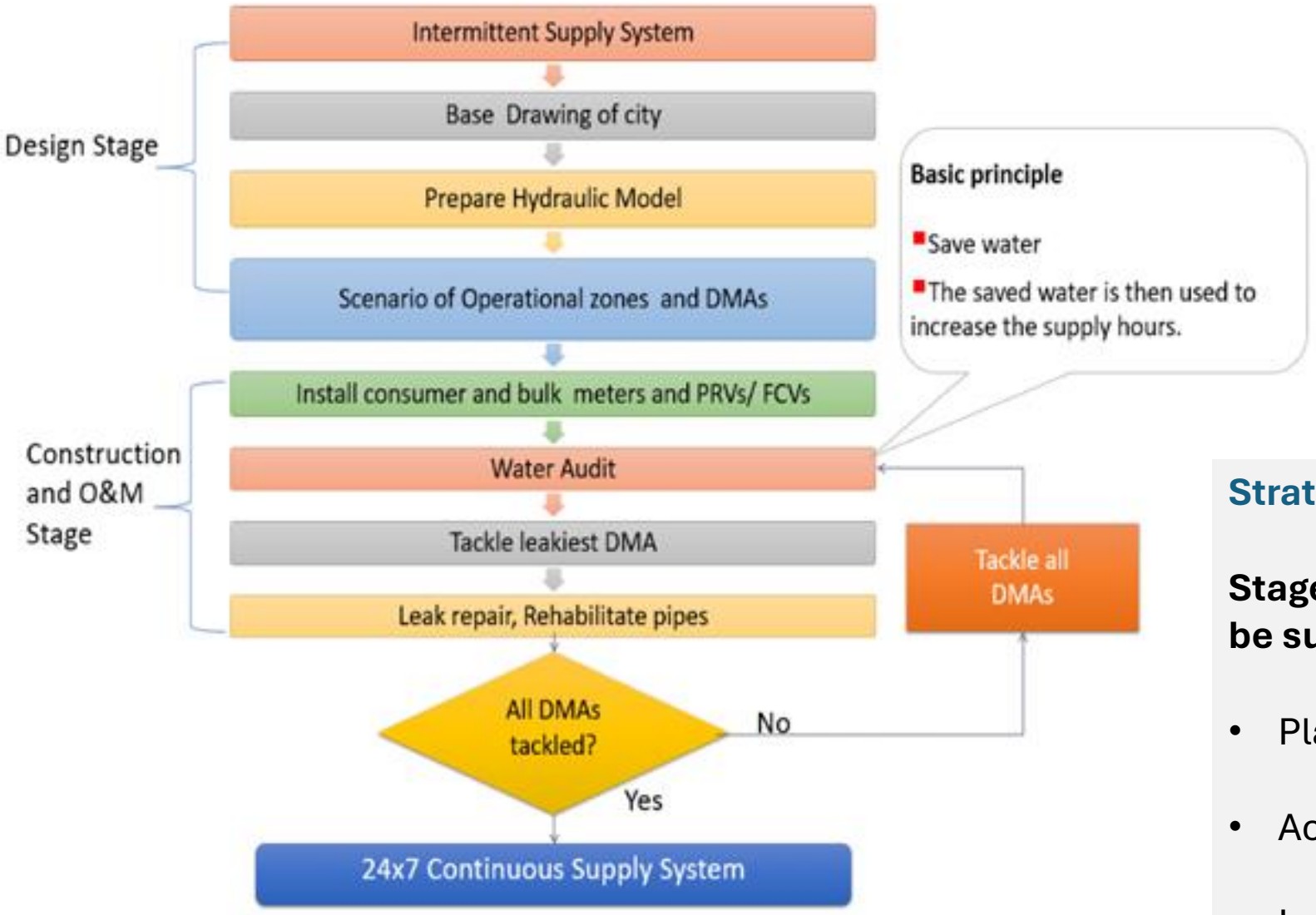
ICHALKARANJI WATER SUPPLY vs MoHUA 24*7 STANDARDS

Parameter	MoHUA 24x7 Water Supply Standards	Ichalkaranji Existing System
Capacity of ESR/GSRs	Minimum **33% of the total demand** of the Operational Zone (OZ)	27 lakh litres GSR Capacity 249 lakh litres ESR (17 ESRs)
GIS Mapping	GIS mapping of all the existing, proposed and executed infrastructure is required	Partially done
Drinking Water Quality	Meets BIS 10500 standards	80% quality according to standards
Minimum Residual Pressure (m head)	12-17 m	
Water Metering	100% metering (household, bulk, DMA-wise)	No metering
Non-Revenue Water (NRW) Control Measures	≤ 15% (Leak detection, pressure management, pipeline replacement)	40%
Dedicated NRW Cell	Required for monitoring & reduction	Currently no NRW cell
Tariff Collection Efficiency	>90 %	54%
SCADA Monitoring	Real-time monitoring	No SCADA Implementation

CONVERSION FROM INTERMITTENT TO 24*7

Parameter	MoHUA 24x7 Water Supply Standards	Ichalkaranji Existing System
Eradication of illegal connections	Identification of illegal connections may be made during customer survey and mapped on GIS.	Not yet done
Water quality testing facility	Water quality should be monitored as per IS 17482:2020	No
Consumer billing and complaint redressal	Computerised billing systems should be encouraged.	Yes exists
Special Purpose Vehicle (SPV)	SPV may be preferred by the city to handle O&M	No
Public Private Partnership (PPP)/ O&M through contractor	AMRUT 2.0 recommends planning and implementation of projects in PPP in cities above 10 lakhs population	No
Training and capacity building	Training on GIS Mapping of Water Supply and Sewerage Infrastructure	No

CONVERSION FROM INTERMITTENT TO 24*7



Strategies:

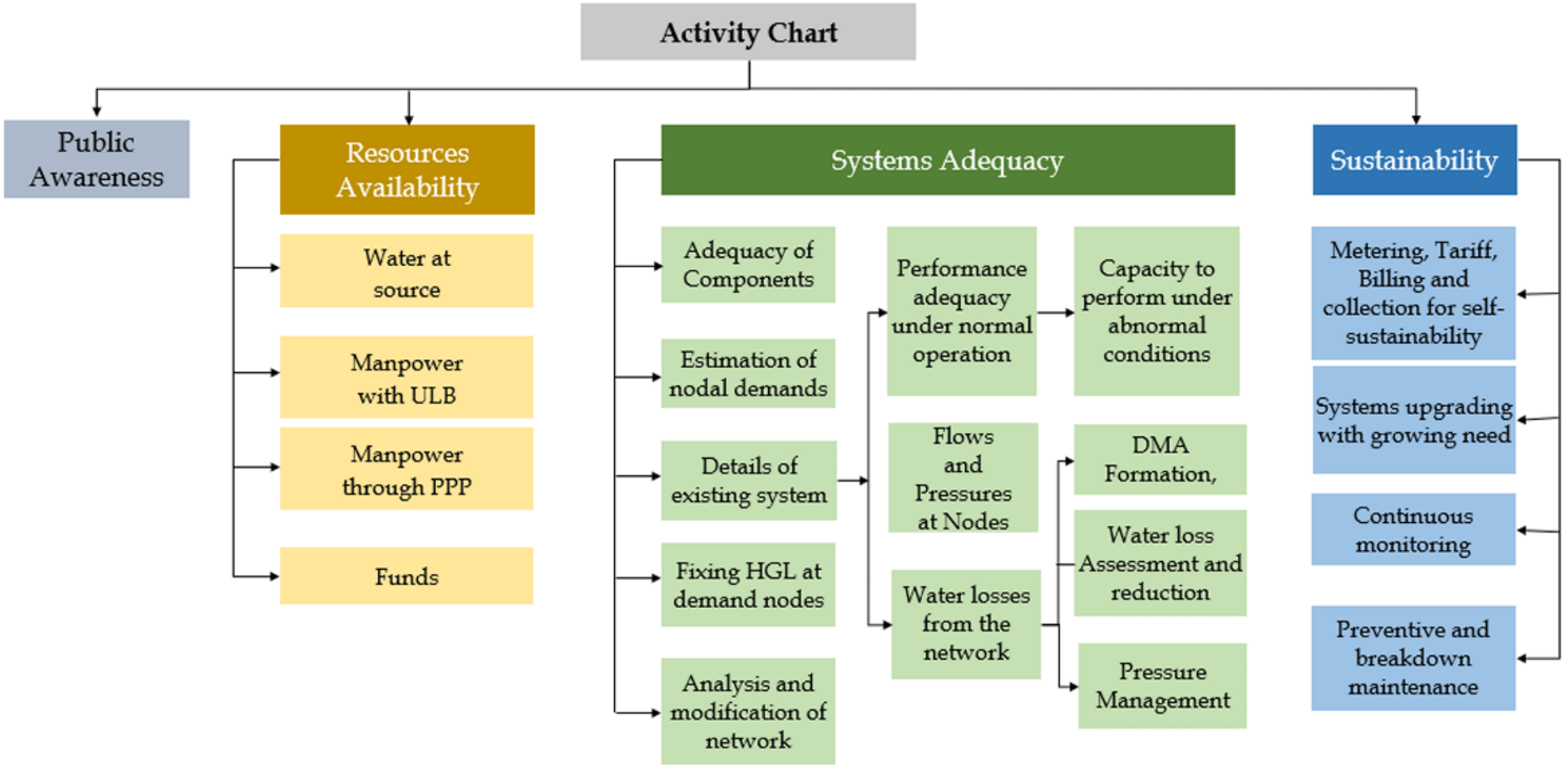
Stages required for conversion to 24x7 can be summarized as under:

- Planning and design
- Actual Conversion to 24/7
- Long-term operational stage

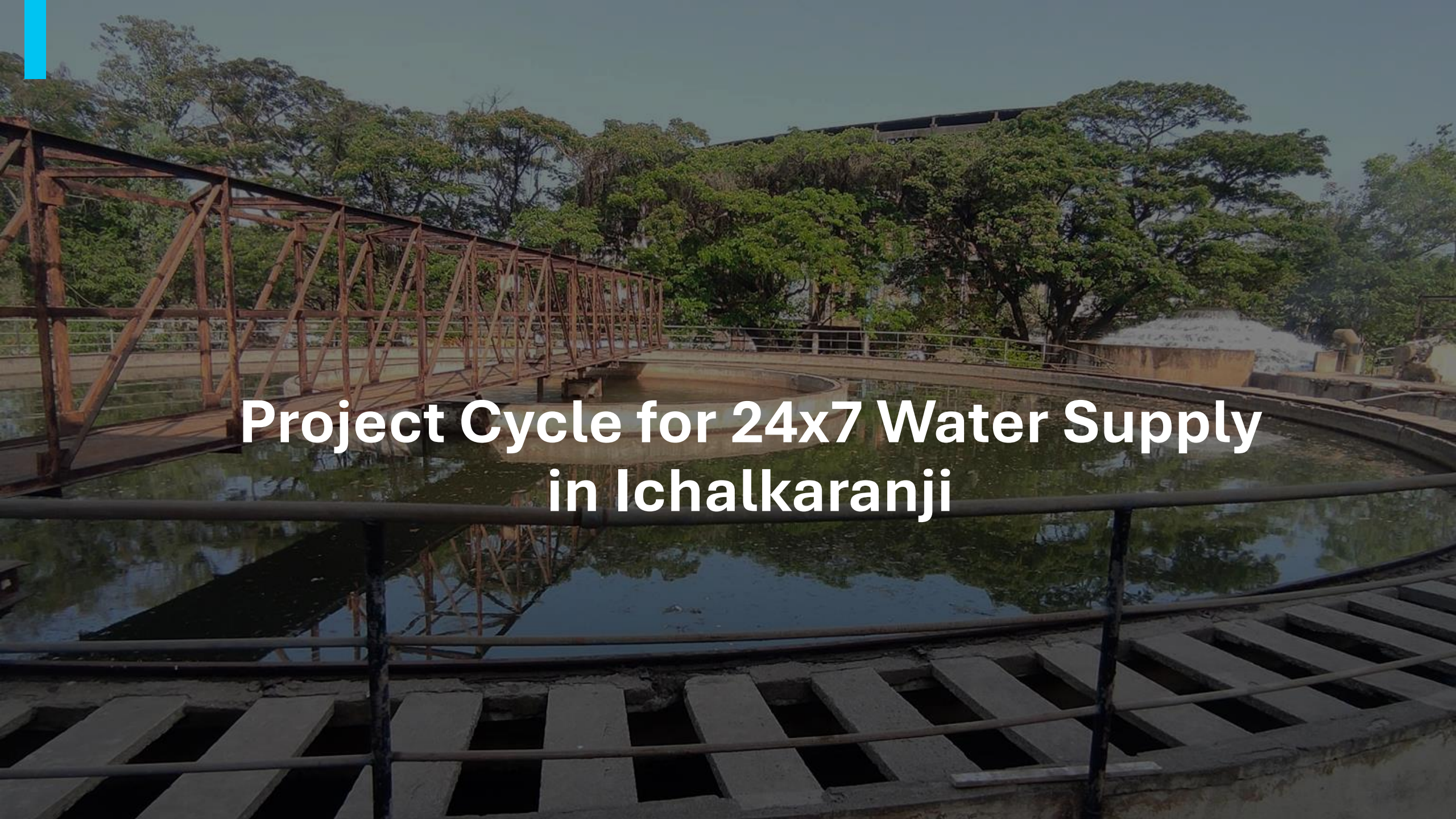
Source : CPHEEO Guidelines for Planning, Design and Implementation of 24*7 Water Supply Systems , MoHUA, 2021

ACTIVITY CHART FOR CHANGE OF MODE

Common activities necessary for adoption of the 24x7 water supply may be considered by Ichalkaranji



Source : CPHEEO Guidelines for Planning, Design and Implementation of 24*7 Water Supply Systems , MoHUA, 2021



Project Cycle for 24x7 Water Supply in Ichalkaranji

STRATEGY FOR IMPLEMENTING 24 x 7 WATER SUPPLY

Source (Surface) → Water Treatment Plant → Water Distribution system → User End

NRW Reduction Strategy

Alternative source options : Installation of Rainwater Harvesting Structures

Sustaining Groundwater Strategy

Augmentation of ESRs and network upgradation

24x7 water supply in slums (pilot implementation)

Citywide water metering

NRW REDUCTION STRATEGY

Tracing the NRW

Policy/Programme/Scheme

- A mandate to plan for reduction of NRW by constituting a NRW cell
- Plan, develop, implement & monitor reduction of NRW under SMC

Action Plan for NRW Reduction

Planning

Phase 1-Leakage Mapping
Phase 2-Comprehensive Water Audit and metering

Implementation

- Approx 50 DMA comprising 1500 to 2500 consumers each
- For Water audit : Installation of bulk meters Flow meters, valves and related accessories

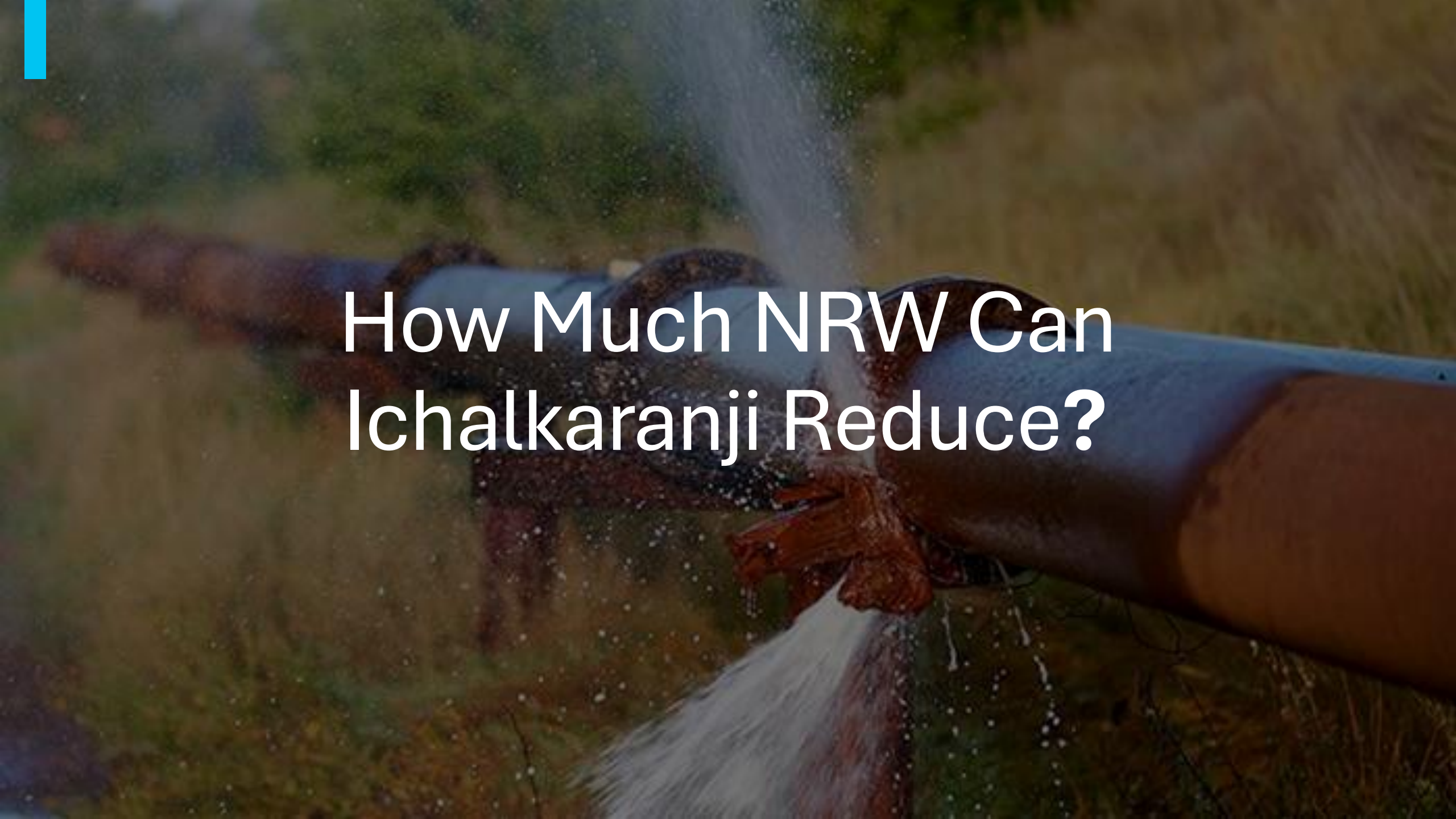
Monitoring & Reporting

- Installation of SCADA system for water distribution network and provide real time data.
- Metering helped in flow of water and detects leaks.
  - Pressure monitoring
  - Water quality testing, identified contaminated

Project Cycle

Infrastructure & Technical Intervention

- **Ichalkaranji Municipal Council should formulate a dedicated NRW cell**
- **GIS-based water network mapping** needs to be prepared
  - Currently absent; should be digitized
  - Leakage complaints should be mapped online
  - Identify and delineate DMA for better water audit and control.
- **Implementation of bulk meters, flow meter valves, and accessories**
- This will help to collect data for losses
- **Adoption of SCADA system for monitoring** in the main distribution system
- IMC will also have to form a **water quality testing lab** to conduct regular water quality tests.



How Much NRW Can Ichalkaranji Reduce?

Towards Efficient Water Management:NRW Reduction Estimate

Intervention	Assumed NRW Reduction in the existing chain	Reason
Leakage mapping + repairs	10%	Directly addresses physical losses
DMA creation + metering	8%	Allows accurate tracking and control
Bulk/flow meters + valves	7%	Helps quantify losses, enhances zone-level control
SCADA + pressure management	8%	Real-time monitoring improves response
GIS digitization + complaint mapping	3%	Helps planning, not immediate direct savings

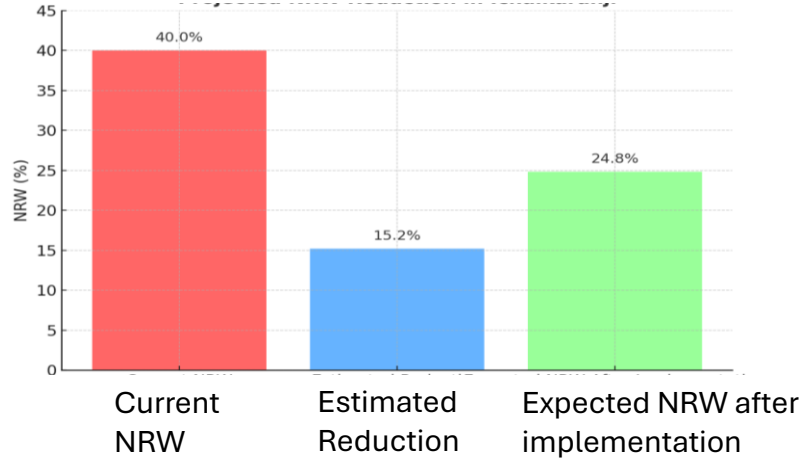
NRW cell formation (coordination + monitoring) (2%)- Improves governance, but limited direct impact

Total Estimated Reduction = 2% + 10% + 8% + 7% + 8% + 3% = 38%

If initial NRW = 40%
& estimated reduction = 38% of that 40%
Then,

Reduction in NRW = 40% X 38/100 = 15.2%

Expected NRW after intervention
= 40%-15.2% = **24.8%**



Total Water Supplied= **45 MLD**

40% NRW

Total Water Loss due to NRW = **13 MLD**

Total Water Saved due to NRW Reduction

=6.75 MLD

Per capita delivery to approximately improve from 80 LPCD from 100 LPCD with NRW reduction

Source : Author analysis based on MoHUA (AMRUT Toolkit), World Bank (2006), *Reducing Unaccounted-for Water in Developing Countries;* Asian Development Bank (2010), *DMA Implementation in Karnataka*; Smart Cities Mission case studies (Nagpur, Surat), NIUA 2021 Report; Pune and Hubli-Dharwad water audit interventions; World Bank (Pune JNNURM report); Surat Municipal Corporation NRW Cell impact note (2018); NIUA benchmarking

AUGMENTATION OF ESRs and NETWORK UPGRADATION

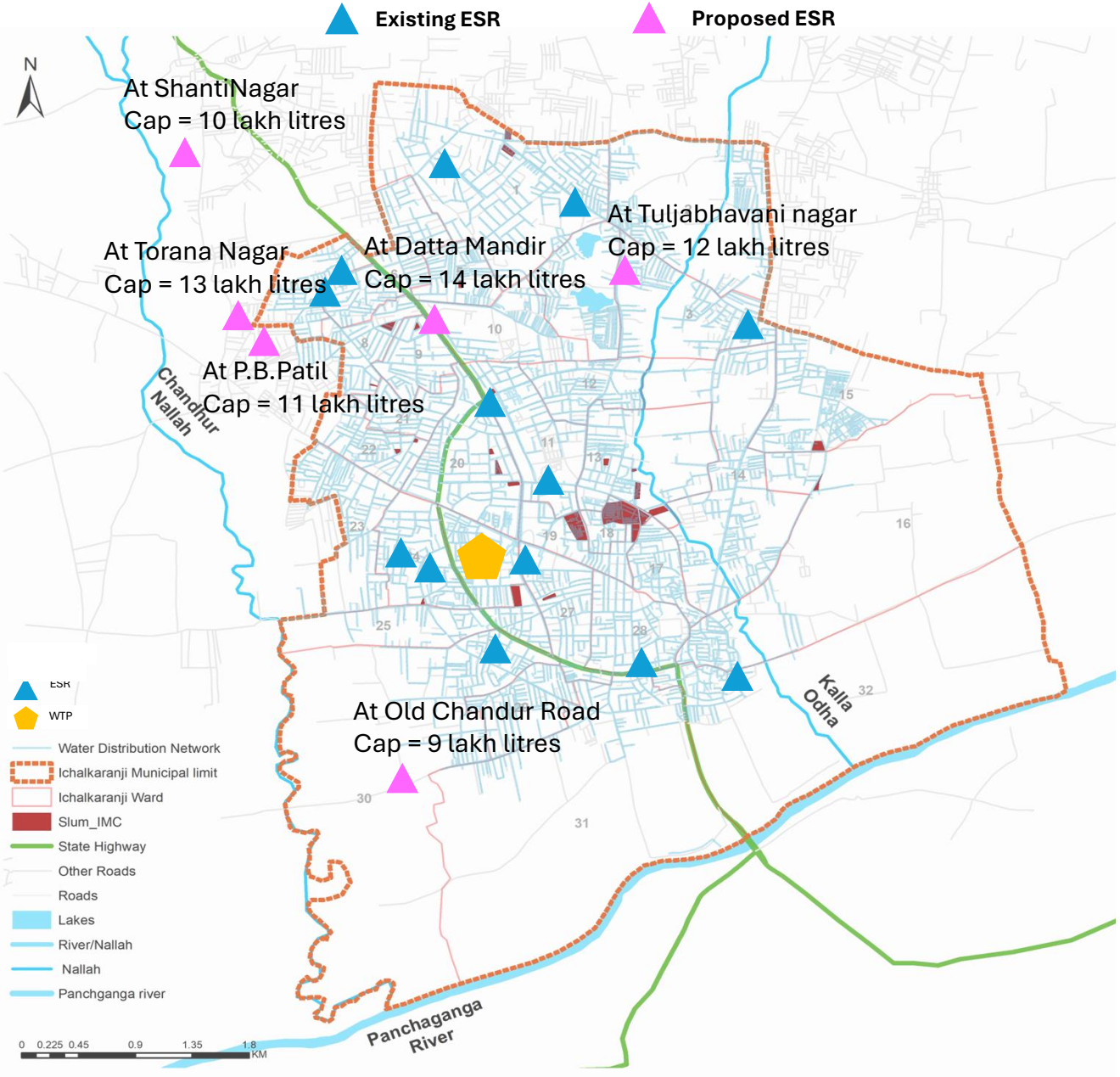
Capacity of ESR (In Lakh litres)	According to MoHUA (33% of the total capacity , in Lakh litres)
19	6.3
18	5.9
25	8.3
20	6.6
16	5.3
11	3.6
13	4.3
15	5.0
6	2.0
18.5	6.1
15	5.0
24	7.9
17	5.6
13.5	4.5
18	5.9

Present capacity of ESRs is **249 lakh litres** with a supply of 80 LPCD. In order to achieve **135 LPCD**, 420 lakh litres capacity is required.

Gap in existing capacity of ESR: 171 lakh litres
Gap in transitioning: **57 lakh litres(requirement)**

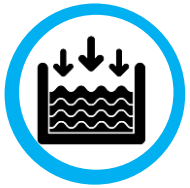
At present 6 ESRs proposed with a total capacity of **69 lakh litres** which will fulfil the gap.

Network Upgradation : Pipes have to be replaced with 100 m diameter MDB and HDPE across the network of 488 km length.



MEASURES TO SUSTAIN GROUNDWATER

Key Issues identified



Over-extraction and declining water table

No regulation or data on private borewells

Low recharge capacity due to built-up areas

Lack of public awareness and poor rainwater harvesting adoption

Recommendations

1. Mapping and Registration

- GPS-tag all borewells (municipal & private)
- Make private borewell registration mandatory
- Digitize groundwater yield and usage data ward-wise

2. Groundwater Recharge

- Make RWH mandatory in all buildings over 150 sqm
- Install recharge pits at traffic islands, schools, parks
- Rejuvenate ponds or lakes for aquifer recharge

3. Monitoring and Control

- Install digital water meters on high-yield borewells
- Monitor water table monthly through piezometers
- Restrict drilling new borewells in critical zones

4. Demand Management

- Promote low-flow taps, dual-flush toilets
- Encourage greywater reuse in housing societies

MEASURES TO SUSTAIN GROUNDWATER

Intervention	Action	Assumption	Impact Estimate (MLD)
Rainwater Harvesting	Install RWH in 10,000 buildings	Avg. roof area = 100 m^2; annual rainfall = 462 mm; 54% collection efficiency	**0.7 MLD**
Recharge Pits / Check Dams	Construct 300 structures in public spaces	Avg. recharge = 5,000 litres/day × 365 days	**1.51 MLD**
Demand Reduction	Promote plumbing retrofits and water-saving awareness	20% reduction in 50% of domestic use (base: 5 MLD)	**1.00 MLD**
Borewell Regulation	Register and meter all borewells, especially private ones	Reduces over-extraction by 7.5–10% of total use	**0.55 – 1.10 MLD**
Greywater Reuse	Implement reuse in 300 housing societies	400 litres/day reused per house × 365 days	**0.11 MLD**
Rankala Lake Rejuvenation	Desilt and enhance recharge through lake bed	Recharge = 150 KL/day × 120 days	**0.20 MLD**
Leakage Reduction	Detect and fix leakages in pumping and distribution	5% improvement on 6.84 MLD pumping efficiency	**0.33 MLD**

Total Water Saved = 4.9 MLD

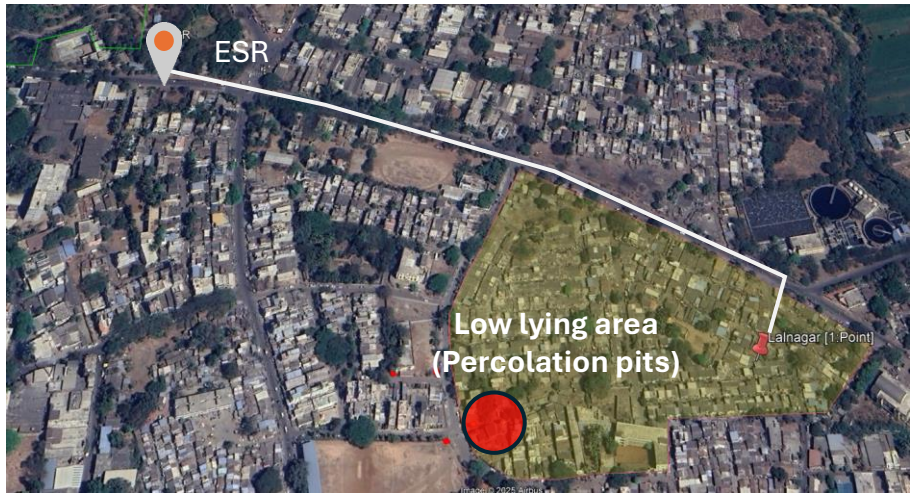
Long term benefits

- **Recharge >50% of groundwater used annually → aquifer balance restored**
- Reduction in **borewell failures, pumping costs, energy use**
- Higher **resilience during drought years**
- **Extended life** of the aquifer → prevents the need for expensive alternatives

Source : Author analysis based on central ground water board (CGWB) , open knowledge repository group – world bank, weather atlas, Addressing Groundwater Depletion Crisis in India: Institutionalizing Rights and Technological Innovations

24x7 WATER SUPPLY IN SLUMS

Pilot implementation in Lalnagar slum



Requires 2 units of pre-casted recharge structures

Rainwater harvested through recharge percolation pits	
Runoff Coeff	0.65
Rainfall(m)	0.5
Area (sq m)	61825
Runoff in cubic m	20093.13
1 cubic meter	1000
Runoff in litres	20093125.00
Runoff in ML	20 ML

Population= 1,740

Households= 348

Daily water requirement: 0.23 MLD

Water requirement per year = 84 ML

Source = Thorat Chowk ESR + Groundwater recharge structure

84 ML

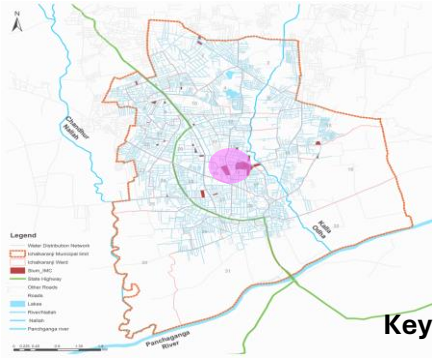
278 days

20 ML

87 days
(during summer)

Potential water recharge through harvesting: 20 ML

Can Serve Water for 87 days!!



Key Map

24X7 WATER SUPPLY SYSTEM In SLUMS -DESIGN and COSTING

Image Source: Sakshi Darak

Solar energy powered submersible pump with required photovoltaic panels

HDPE storage tank of required capacity elevated at **3 m height** to give sufficient head for the distribution system

Steel structure for mounting HDPE Water Tank

Distribution system with **individual tap connections** for required number of households

Capacity of tank : 5 L- 10 L

Total capital cost: 5 lakhs

CSR Funding Options		
Name of Company	**Type of project**	**Scale**
Coca-Cola India Foundation (Anandana)	**Water management**	**500 villages**
Parivartan Yojana – HDFC initiative	**Ground-water recharge structures**	**31 villages in Jalgaon, Maha**
Carlsberg India and WaterAid India	**Water-replenishment program**	**5 Gram Panchayats**

Benefits

- 24x7 water supply to slum dwellers
- No need to store water meaning reduced contamination
- Groundwater recharge – Saved water can be used for 87 days
- Pump working on renewable energy
- Cost effective

ACHIEVING 24 x7 WATER SUPPLY IN ICHALKARANJI

For **wider and faster** implementation of these WATER SUPPLY strategies

Policy Level Changes

- ✓ **ALL Slums** should be provided with **individual water supply connections** hindering equitable access to basic water supply services.
- ✓ **Volumetric tariff based consumption** should be adopted.
- ✓ **Metering** should be mandated for all HHs.
- ✓ **Mandatory RWH structures** for all HHs through incentivisation on property tax

Community Participation and SHG engagement

Infrastructure Upgradation

- ✓ Infrastructure should be strengthened under AMRUT 2.0 or Jal Jeevan Mission **for All Slums**
- ✓ Ensure **last mile connectivity for individual water connections** in the city and slums under AMRUT 2.0
- ✓ **Water Quality Testing Labs** to be set up.
- ✓ **NRW cell** to be set up for regular monitoring
- ✓ **Regular water and energy audits** (once in three years)

ROLES AND RESPONSIBILITIES

Existing agencies

Proposed

ROLES AND RESPONSIBILITIES-STAKEHOLDER MAPPING

Activities	IMC	Self Help Group (SHGs)	PPP	MJP	ITIs	Ichalakranji Water Academy	NRW Cell
Network upgradation Under AMRUT 2.0 funding, Municipal Bonds)	✓						
Installation of water meters	✓	✓					
Water meter policy and tariff setting	✓						
Ensuring 100% water metering		✓					
Monitoring water quality treatment		✓	✓				
Monitoring overconsumption of water		✓					
Collection of water tax	✓	✓					
Technical Training, Engineers, Plumbic Licensing				✓	✓	✓	
Reduction of NRW,Monitoring NRW losses	✓						✓
Communication and change management		✓		✓			

PHASING AND COSTING

Projects	2025	2026	2027	2028	2029	2030	2031	2032
NRW Reduction Strategy								
Augmentation of ESRs and network								
24x7 water supply in slums (Pilot)								
24x7 water supply in slums (Scale-up)								
Measures to sustain groundwater								

Components	2025	2026	2027	2028	2029	2030	2031	2032	Total cost	Funding Source
NRW Reduction Strategy -Water audit -Hydraulic modelling -Installation of bulk flow meters -Water Metering -Creation of NRW cell and water quality testing lab	5 crore	5 crore							10 crore	AMRUT 2.0 + ULB own funds + Municipal Bonds
Augmentation of ESRs and network upgradation		50 crore	50 crore	41 crore					141 crore	AMRUT 2.0 + Municipal Bonds
24x7 water supply in slums (pilot)	Project initiation	5 lakhs							5 lakhs	CSR Funds
Measures to sustain groundwater -Rainwater harvesting structure - Recharge pits -Greywater reuse -Lake rejuvenation		10 crore	10 crore	6 crore	O&M for sustenance				26 crores	AMRUT 2.0 +CSR Funds
Total cost	~177 crore									

IMPACT ASSESSMENT

IMPACT

PROJECT IS FINANCIALLY FEASIBLE, IT IS SOCIALLY VIABLE

7000+ SLUM DWELLERS IN ICHALAKRANJI DURING PILOT IMPLEMENTATION

3.4 LAKH PEOPLE WHEN SCALED IN ICHALKARANJI CITY

SUSTAINABLE DEVELOPMENT GOALS

11 SUSTAINABLE CITIES AND COMMUNITIES

5 GENDER EQUALITY

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

6 CLEAN WATER AND SANITATION

10 REDUCED INEQUALITIES

17 PARTNERSHIPS FOR THE GOALS

"Because no matter who we are or where we come from, we're all entitled to the basic human rights of clean air to breathe, clean water to drink, and healthy land to call home."

-Anonymous

THANK YOU!

Source: Global citizen (2024). India Pledges to Provide Clean Water to All Rural Households by 2024 (globalcitizen.org)