



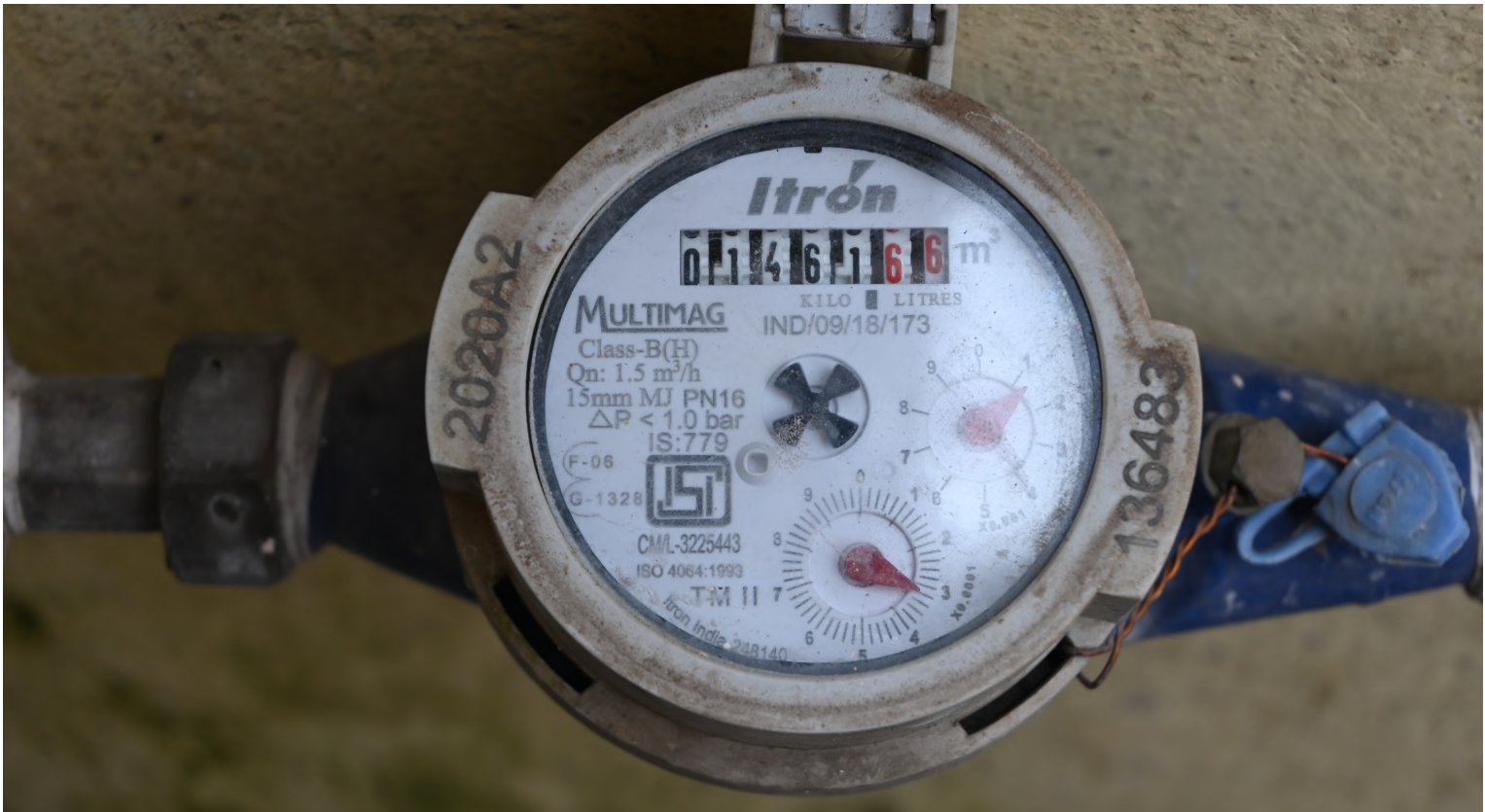
NIUA
National Institute of Urban Affairs

**WATER &
ENVIRONMENT
VERTICAL**

The water supply story of Puri, Odisha

DRINK FROM TAP







“DRINK FROM TAP”

Key Messages



“

Quality drinking water is closely linked to human health, human development index and economy. Providing drink from tap quality pure water to every home has been my long-cherished dream for Odisha! I am happy to dedicate Sujal Drink from Tap quality 24x7 water supply to every home in Puri city. Drink from Tap Mission is a transformative step in the direction of my dream of making Jagannath Dham Puri, a world class heritage city.

I am glad that Puri has become the 1st city in India to have round the clock quality drinking water from tap, joining the league of select international cities. Quality water from tap will benefit the people of the city and millions of tourists visiting Jagannath Dham. We are committed to expand the Drink from Tap Mission to 22 more cities across the State as a part of 5T governance framework, ensuring people have quality drinking water straight from Tap at their homes.

”



Shri Naveen Patnaik,
while dedicating Drink from Tap Mission in Puri, Odisha
on 26th July, 2021

“

The urban water sector in Odisha has improved by leaps and bounds in the last few years, at an unprecedented pace. The flagship Drink from Tap Mission is the latest addition to the list of our accomplishments in this sector.

The hallmark of Puri's DFT system is the harmonization of state of the art technology with community partnership. The contribution of Jalsaathis, our community partners, has ensured grassroots level outreach and has been the standout reason for success of the Mission.

The DFT Mission is a great example of how visions can be translated into reality in an efficient and timely manner. This knowledge product encompasses key features of the mission and the lessons learnt, which I hope will inspire other cities in India and beyond.

I congratulate the WATCO team for achieving the feat and wish them all the best for scaling up the Mission in rest of the State.

”



Smt. Usha Devi,
Minister of Housing & Urban Development
Government of Odisha

“

The commissioning of 24x7 Drink-From-Tap Mission in Puri, the 1st of its kind at pan city level in India, has set a new milestone in the history of water supply system of the country. Water conforming to IS: 10500 quality standards is now available round the clock in every household of Puri, benefiting 2.5 Lakh people, including 66,000 urban poor, significantly eliminating the spread of waterborne diseases in the city.

Women share a disproportionate burden of water in our households. This mission has saved considerable time for women which otherwise would be spent on fetching water, enabling them to explore educational and employment opportunities.

The Mission has also resulted in potential avoidance of 400 metric tonnes of plastic waste every year in this pilgrim city having an annual footfall of 20 Crore visitors.

The Smart Water Management System with industrial IoT embedded in its network, captures real-time vital data including leakages, for effective management (First City-level Drinking Water supply system in India to deploy IoT). As a result, water loss has steeply declined from 47% to 15%. In addition, the programme engages women self-help group members drawn from the community, a strategy which empowers women besides making 100% metering and over 99% revenue collection possible.

The Drink from Tap mission was made possible only because of the vision and guidance of our Honourable Chief Minister Shri Naveen Patnaik. This transformative journey is the result of his strong commitment to the people of Odisha to provide directly drinkable water to every home.

The success of our Journey from Drinking Water Scarcity to Water Secure Odisha is largely attributable to the strong political will at the level of Honourable CM and the highly committed and passionate efforts of my team led by Mr P.K.Swain, CEO, WATCO.

I am sure that this knowledge product which is aimed at capturing the essence of our experience along with insights and learnings from the implementation in Odisha will provide confidence, motivation and encouragement to other Cities, States and Countries in the developing world to replicate this programme.



G. Mathi Vathanan,
Principal Secretary, Housing and Urban Development and Chairperson,
WATCO
Government of Odisha

”

About the Publication

Publication

The water supply story of Puri, Odisha – Drink From Tap (2022)

Publisher

Housing & Urban Development Department (H&UD), Government of Odisha
Water Corporation of Odisha (WATCO)
National Institute of Urban Affairs (NIUA)

Summary

The publication reflects on the “DRINK FROM TAP” Mission (also called the “SUJAL” Scheme) launched in October 2020, spearheaded by the Government of Odisha’s Housing & Urban Development Department. Water Corporation of Odisha (WATCO), a state-owned, not-for-profit company is the implementing agency responsible for rolling out this mission.

Acknowledgements

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Survey Team

Sparsh Social Foundation

Disclaimer

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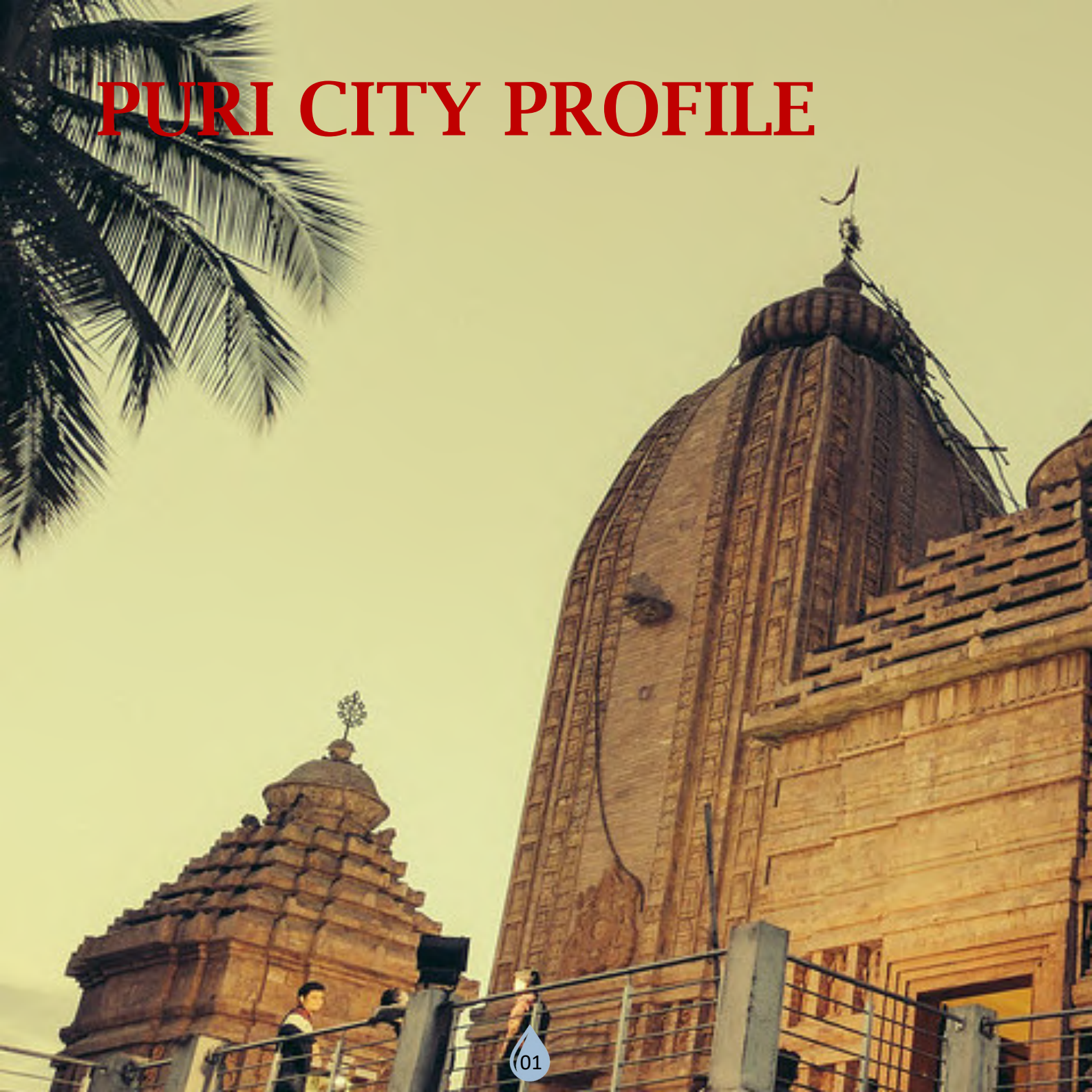
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Larger Implications of Puri's Story

Reference for other cities

PURI CITY PROFILE

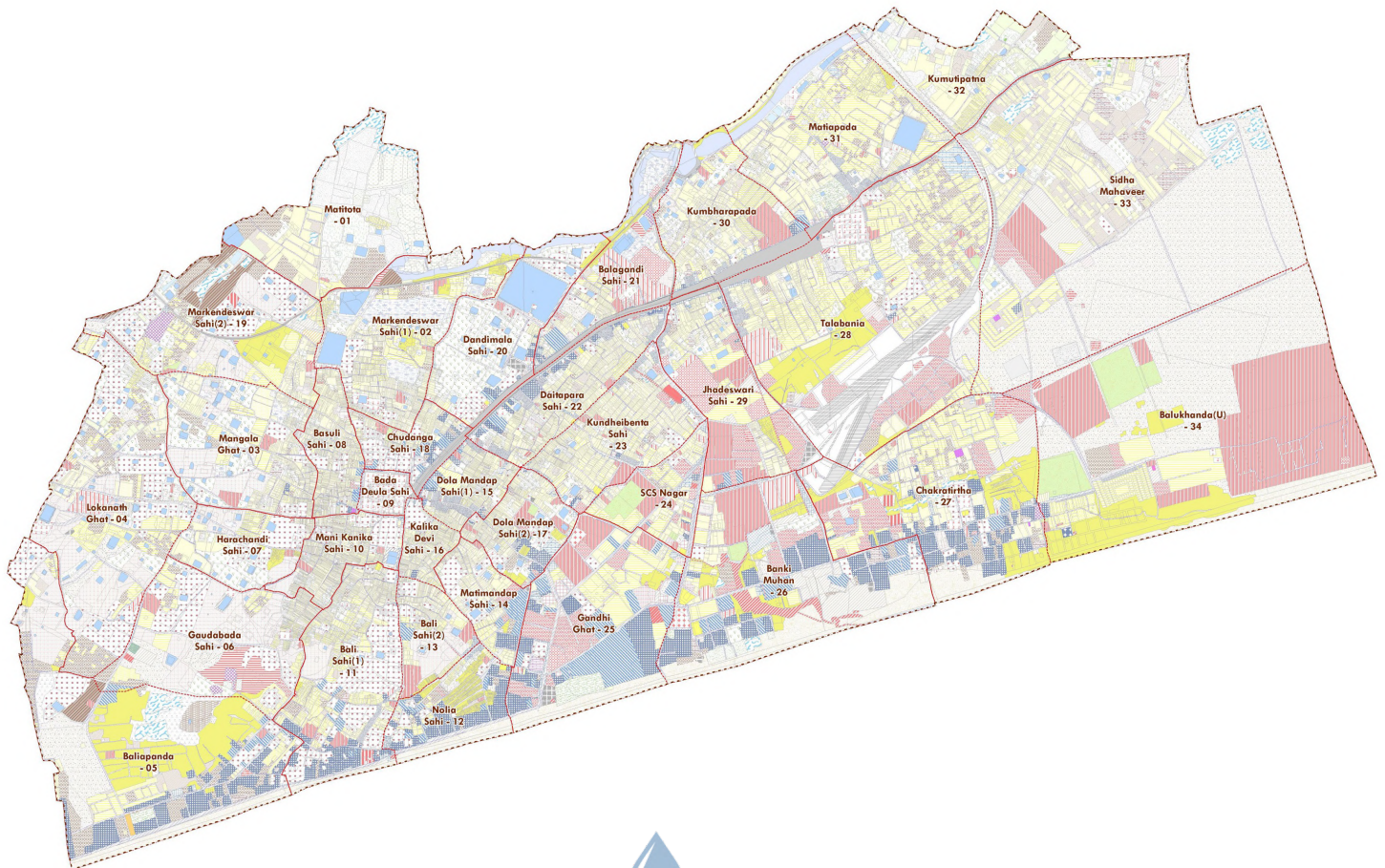


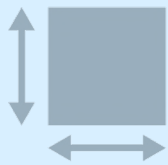


Puri is a coastal city, located in the Eastern part of Odisha. The city is also commonly known as Jagannath Puri because of the famous 12th century Jagannath Temple that is located in the city. Puri is situated on the coast of Bay of Bengal, 55 km away from the state capital Bhubaneswar. It is one of the original **Char Dham** pilgrimage sites for the Hindus.

The city is famous for its Annual Rath Yatra that takes place in June-July, and is attended by over a million people. It is among the heritage cities for Heritage City Development and Augmentation Yojana (HRIDAY) scheme of the Indian Government. The economy of Puri is primarily dependent on religious tourism, which provides employment to almost 70% of the locals.

The water supply and sewerage services in the city is managed by the Water Corporation of Odisha (WATCO).





Area of city
16.84 sq km



City Population
(2011 census)
2.5 Lakhs

Total slum
population
66,000



Main economic activities
**Tourism, Fishing,
Handicrafts**



Considered as one of the
'Char Dhaams'
(abode)



Annual visitors
20 Million



No. of Households
32,017



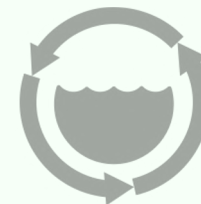
Total Water Demand
38 MLD



Main source of water
River Bhargavi



Water supply system managed by
Water Corporation of Odisha



Capacity of Water
Treatment Plant
42 MLD



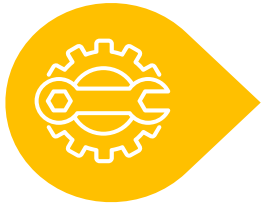
**WHY
THE ASPIRATION FOR
DRINK FROM TAP ?**



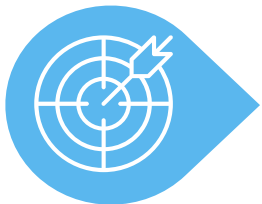
Journey to 'Drink From Tap'



Until 2015, only 50% of the households in Puri had piped water connections. The rest had to rely on public standposts, water tankers or other sources of water. Moreover due to lack of inadequate infrastructure and metering, huge water losses were observed in the system, amounting to almost 47%.



Even in networked areas, there was disparity in supply with affluent areas receiving significantly more water than other areas. Furthermore, supplies were erratic, at low pressures and often contaminated.



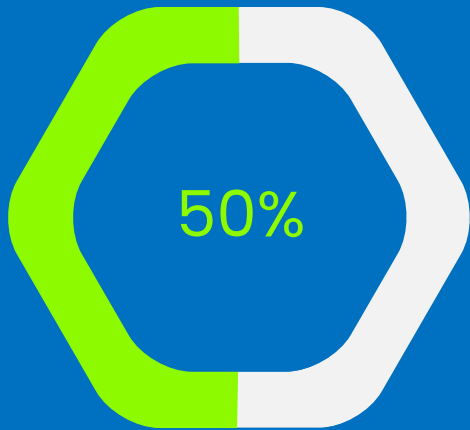
In 2017 the honourable Chief Minister desired that every home in every city should be provided with pipe water supply, which resulted in the birth of the Buxi Jagabandhu Assured Drinking Water to Habitations (BASUDHA) initiative. Between 2017-20, there was a fivefold increase in the investment in water sector, with 6,000 kms of new pipe network added to the existing infrastructure. Much of this was supported through the BASUDHA Mission in 105 cities and the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) in 9 cities.



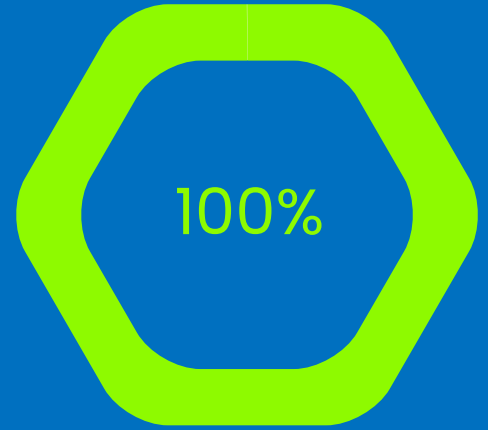
In 2020 honourable Chief Minister further desired that the water that is supplied to the public should be of directly drinkable quality which resulted in launch of the DFT mission. The Water Corporation of Odisha (WATCO) was tasked with implementing the Mission. The Mission was pilot tested in 8 zones in Bhubaneswar and 4 zones in Puri to help scale up the Mission for the entire city.

In July 2021, Puri got the distinction of becoming the first city in India to provide 'drink from tap' quality water round the clock.

Households in Puri with piped water connections

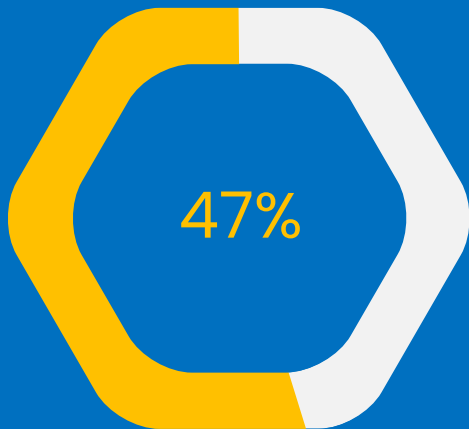


2015

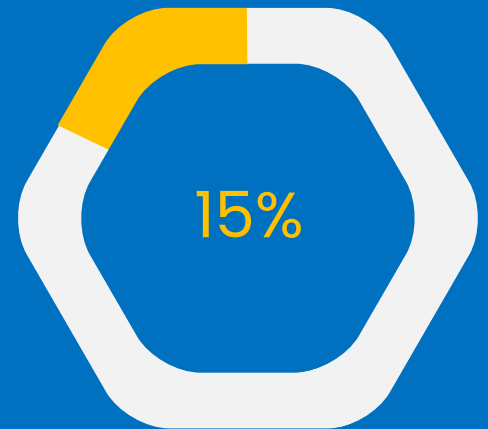


2021

Non-Revenue Water in the system



2015



2021

Objectives of 'Drink From Tap'

The broad objectives of the Drink from Tap mission are to:



Provide IS 10500 quality water to every household, which can be used directly for drinking and cooking purposes, without the need for further filtering and disinfection



Ensure equitable, sustainable and people-centric provision of water supply, with a focus on the urban poor



Facilitate the reduction in individual or household investment for storing and treating water.



Adopt state-of-the-art technology for real-time operation and maintenance of the System



Foster community-led drinking water distribution management systems as a means to ensure long-term sustainability of the system



Achieve 100% metering in order to reduce NRW

Alignment with National and International Initiatives

The DFT mission is closely aligned with various International Agreements, National and State Missions.

INTERNATIONAL



The [target 6.1](#) of the [2030 Agenda for Sustainable Development](#) calls for 'universal and equitable access to safe and affordable drinking water for all'. The DFT Mission will play a vital role in helping Odisha meet the relevant targets under SDG 6.

Presently, the centrally sponsored schemes such as [AMRUT 2.0](#), and [Smart Cities Mission](#) also aim at augmenting existing water supply systems. Drawing from the success in Odisha, AMRUT 2.0 encourages cities to leapfrog from intermittent systems to Drink from Tap system.

NATIONAL



STATE



The DFT scheme is in line with [the Odisha State Urban Water Supply Policy \(2013\)](#), which envisions providing universal access to potable piped water supply, on 24/7 basis, at an affordable price and in an equitable, sustainable and eco-friendly manner, with verifiable service level bench-mark for citizens in urban areas, by the year 2027.



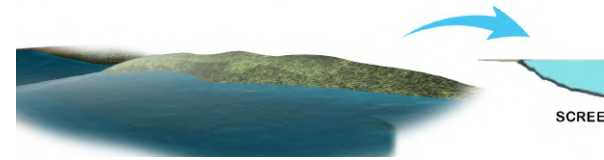
Elevated Storage Reservoir (ESR) in Puri



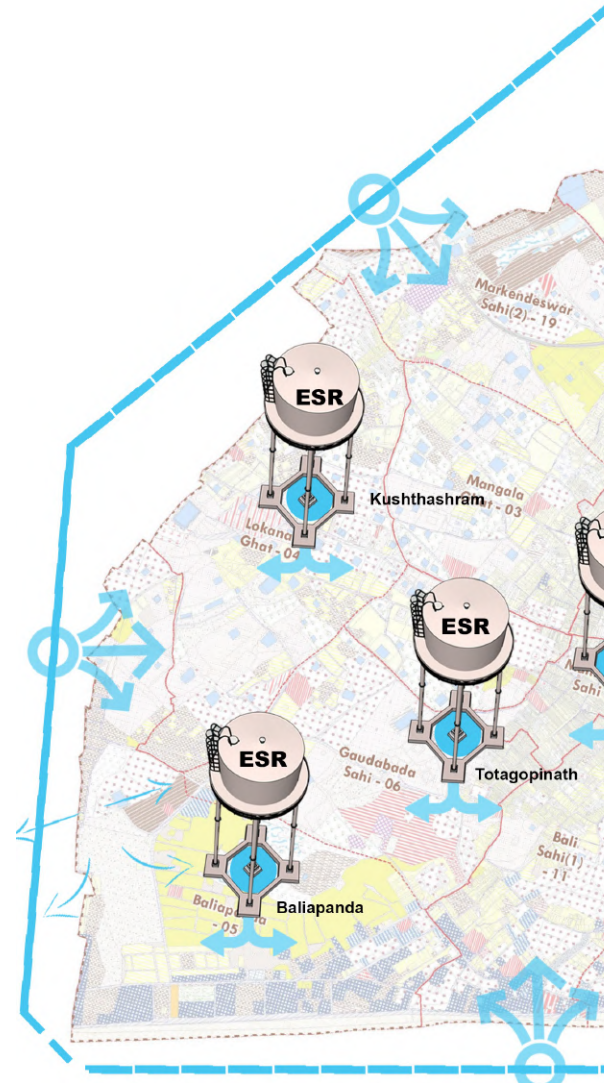
DFT scheme provides round the clock water supply to all slum households in Puri

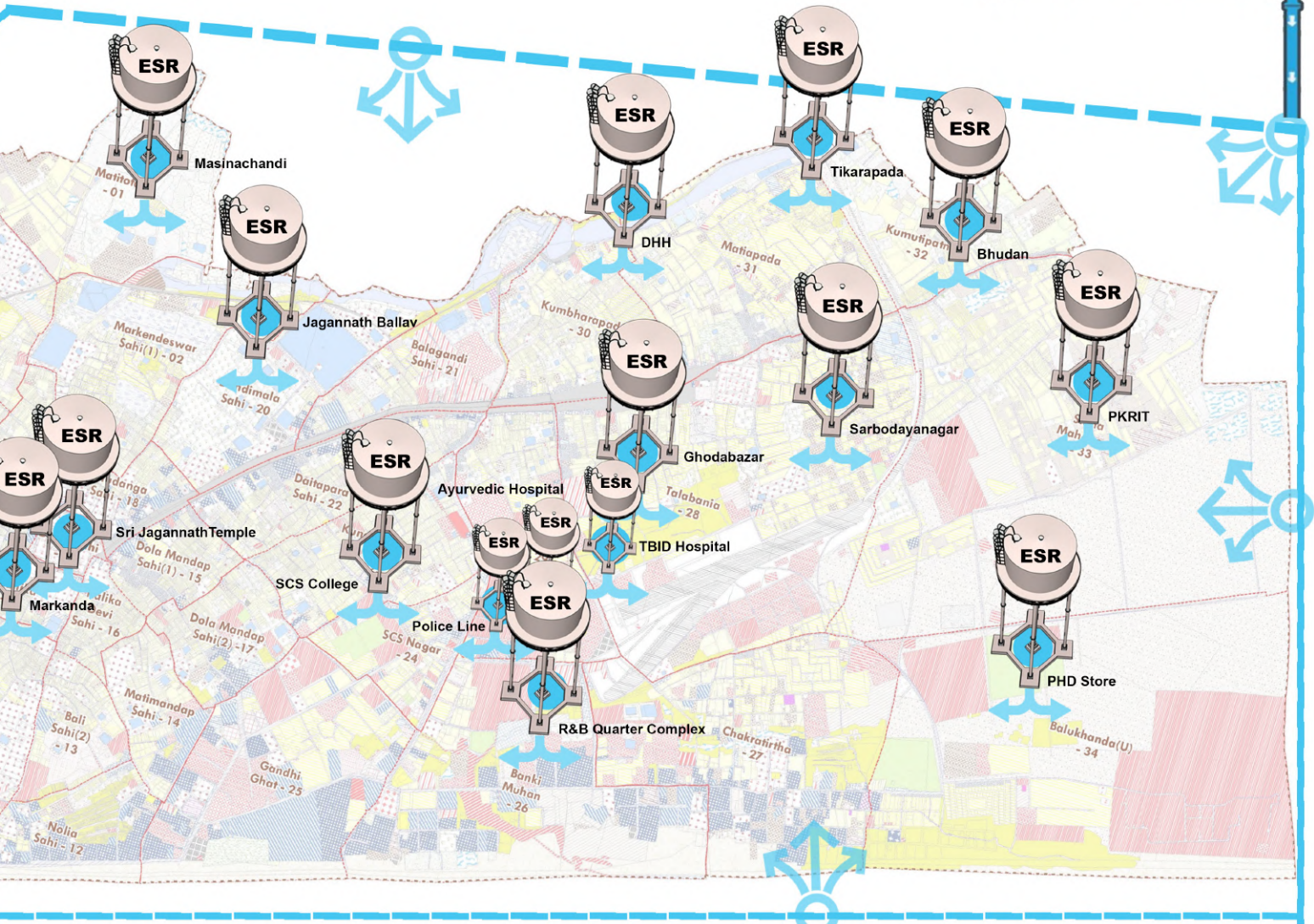
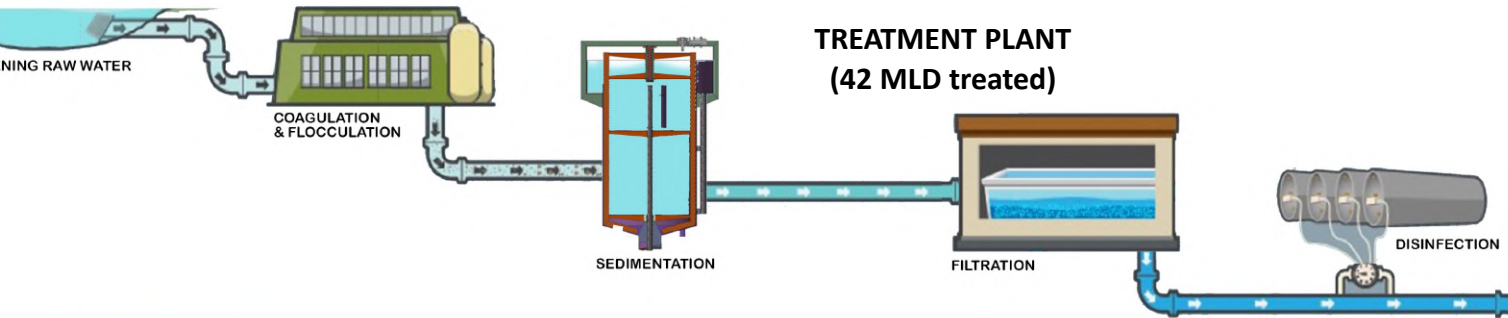
Overview of the DFT System in Puri

Water is drawn from the Bhargavi River, from where it is conveyed to a reservoir and then sent to a Water Treatment Plant at Samang. Here, it goes through an advanced treatment process using membrane filtration. Treated water is then pumped into the 46 km of rising mains around the city, from where it is directly fed to 19 Elevated Storage Reservoirs (ESR) across the city. There are also 5 ground service reservoirs that are used as a back-up in cases of emergencies. The city is divided into 19 operation zones or District Metering Areas with 1000-2000 connections in each. Water from the ESRs is supplied to households in these zones through a piped network of 275 km.



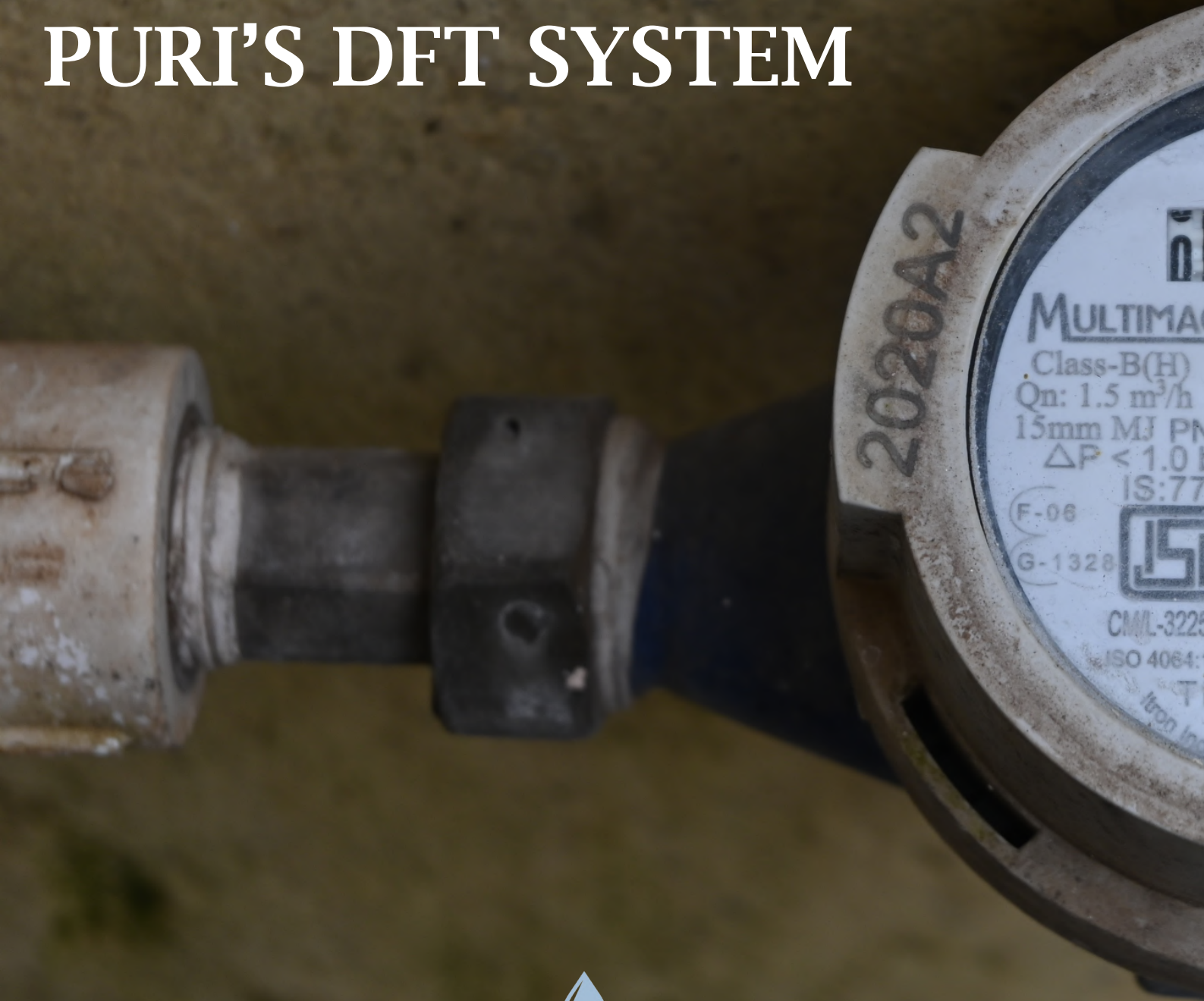
BHARGAVI RIVER





RISING MAIN

KEY FEATURES OF PURI'S DFT SYSTEM





Conducive Policy Measures



To ensure effective implementation of the DFT Mission, a number of enabling policy measures were put in place. These include:

- (i) Shifting the responsibility of getting a household connected to the DFT system from the consumer to WATCO to have a standardized approach for implementing the Mission as well as target leak-proof connections.
- (ii) Significantly reduced paperwork requirement for household connections. Residents, irrespective of their house ownership status, could avail a connection without any hassle.
- (iii) Introduction of interest free instalment system for those who could not afford the connection fees upfront.
- (iv) Complete exemption of urban poor households from payment of connection fees
- (v) Exemption from road cutting charges
- (vi) Establishing community partnerships with 'women-only' Self Help Groups called "*Jal Saathis*" for facilitating doorstep services such as new household connections, bill collection, on-site water quality testing, and to serve as the interface between WATCO and consumers.



A number of Standard Operating Procedures (SoP) and Toolkits have been prepared for smooth and standardised upscaling of the Mission.



Water Treatment Plant at Samang

Boosting system efficacy



In order to ensure a sustainable model, necessary feasibility assessments have been carried out to ensure round-the-year dependable raw water supply from the usual sources.



In order to ensure uninterrupted water supply, diesel generator sets have been installed at all pump houses as alternative sources of power supply. Mobile power backups are even mounted over trucks or wheels, which can be rushed to any required site for immediate use.



An automated system has been established for recording and storing data from all District Metering Areas. For all vital parameters like flow, pressure, and water quality, data is available for every 5 seconds.



120 drinking water fountains have been set up along the Grand Road leading to the Jagannath Temple and other popular places. These public water fountains help in eliminating the use of plastic water bottles. It has been estimated that this initiative will help eliminate 400 Tonnes of plastic waste every year.



Providing quality drinking water to the urban poor has been given special emphasis in the Mission. While many of the slum households used to depend on community water taps earlier, each slum household has been provided a separate tap connection under this scheme.



SAFE
DRINKING
WATER

ବିଶୁଦ୍ଧ
ପାନୀୟ
ଜଳ



DRINK
FROM
TAP

For Query 155359 & 06752 223447
(Toll Free) (Office)

Drinking Water Fountain at Grand Road, Puri

Smart water management



All the assets and consumers in the entire city have been mapped over a GIS platform, for efficient implementation as well as robust operational and maintenance activities.



Real-time data is obtained from Programmable Logic Controller (PLC)/ Supervisory Control and Data Acquisition (SCADA) to a central server. The 'Smart Water Management System' further helps in real-time data capture, analysis, decision making and public reporting on quality surveillance. This captures data from source to consumer points, for real time monitoring of flow, pressure, chlorine content of water, etc.

Unique aspects of the Smart Water Management System

First city in India to have IOT based real time monitoring of water supply quantity and quality

Real-time quality surveillance

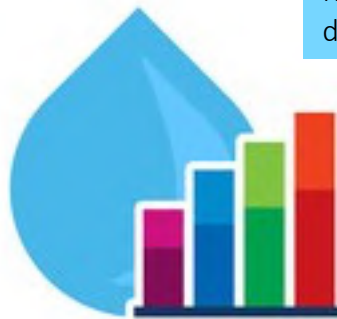
Data capture for preventive maintenance of water supply assets

Efficient incident management and quick resolution of problems

Real-time data analysis and decision making

Reduction of non-revenue water through leakage detection and control

Efficient consumer complaint redressal for consumer satisfaction





Pressure gauge and alarm system to monitor water supply



Supervisory Control and Data Acquisition (SCADA) used for Smart Water Management

Ensuring high quality water

The DFT system ensures stringent quality control. The water supply adheres to "Quality Standards of IS 10500", set by the Bureau of Indian Standards. Accordingly, the water received by any consumer can be used directly for drinking and cooking purposes, without any need for filtration, boiling or any other treatment.

In order to ensure IS 10500 quality water in each home, strengthened water quality monitoring and surveillance activities have been implemented. Reliable and real-time monitoring of water quality has been given equal priority as the supply.

Strengthened water quality monitoring and surveillance activities

State of the art laboratories set up in PPP mode

Mobile water testing laboratories called "Lab on wheels" set up with trained manpower and necessary equipment

Public display of water quality



Standardized water quality test kits prepared and necessary training provided regularly to staff to conduct daily tests

Chlorine analysers installed at the farthest points of the network, and automated chlorine dosing systems installed at all key locations



One state level and eight divisional level laboratories have been established on PPP mode, for continuous testing and monitoring of water and wastewater quality. This testing is fully independent of WATCO and is carried out by independent laboratories. The water quality data is stored in a centralised server, for analysis and quick decision making on mitigation measures.



Mobile van laboratories, also called 'Lab on Wheels', have been deployed to ensure on-site water quality testing, surveillance and monitoring. In case of any water quality compliant or contamination incident in the network, this lab is moved to the location to conduct the vital water quality tests.



Jal Saathis are equipped with portable Field Testing Kits, for checking the household water samples. They conduct water quality tests for residual chlorine and faecal coliform, and report the results to PHEO/ WATCO. These tests results are used to develop water quality profiles of different areas within each zone.



Public dashboards, displaying real-time water quality data on LCD screens, have been installed at strategic locations in the city in order to build confidence and trust in users.



Real-time data on water quality can be obtained from the online 'Smart Water Management System'.



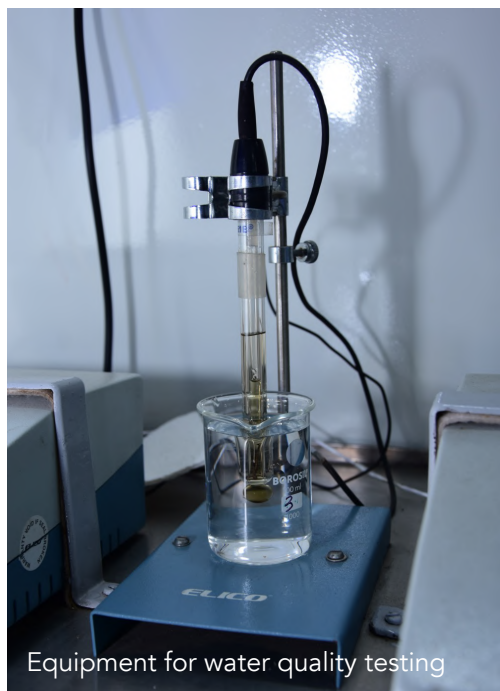
Sensor-based chlorine analysers have been installed in the farthest end of the network. In any instance, if the residual chlorine levels fall below the prescribed limit, the 'Automatic Chlorine Dosing System' starts automatically to maintain the minimum residual chlorine and ensure assured drinking quality water.



Lab on Wheels for on-site water quality testing



Water quality testing



Equipment for water quality testing



Water quality testing



Chemical Dosing System



Portable Field Testing Kit

Reducing Non-Revenue Water



Puri has completed [100% metering of household water connections](#), in order to reduce the non-revenue water.



The house connection ferrule (a right angled sleeve which is joined to a hole drilled in the water main points) were observed as the potential leaking points. Almost all [house connection ferrules are now replaced with saddle and compression fittings](#), in order to reduce the NRW. These fittings ensure a perfect hydraulic seal in the construction of the pressurized distribution systems, thereby preventing leakages.



An exclusive [Non-Revenue Water Cell](#) has been created within WATCO, with the intent to reduce the leakages. The cell comprises of dedicated staff tasked with monitoring, identifying and acting upon incidents of physical losses. These staff are provided with dedicated training periodically to help carry out the tasks.

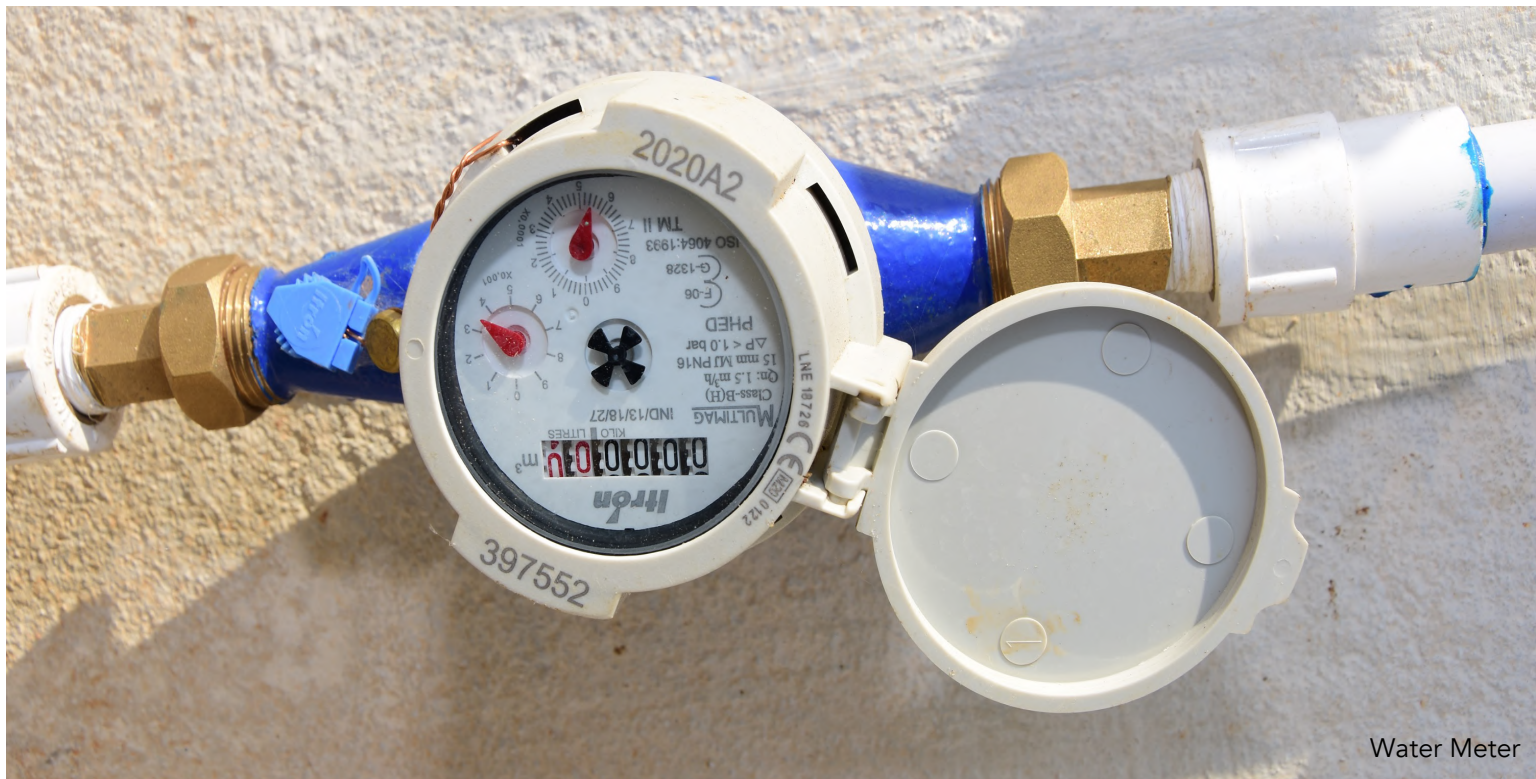


The community partnership with Jal Saathis has helped in quick mobilization of resources for resolving issues related to leakages.



Issue resolution time has reduced from weeks and days to hours because of the Smart Water Management system, which provides real time information on leak detection.

As a result of these initiatives, the NRW in Puri has come down from 47% in 2017 to less than 15% in 2021. This has also resulted in reduction in the cost of production of water.



Water Meter



Saddle and Compression fittings

Building Public Trust



An extensive IEC campaign called 'Pure for Sure' has been rolled out, for building public confidence and trust in quality of water supplied through the DFT system. Under this campaign, a number of awareness, sensitization and motivational activities are carried out regularly.

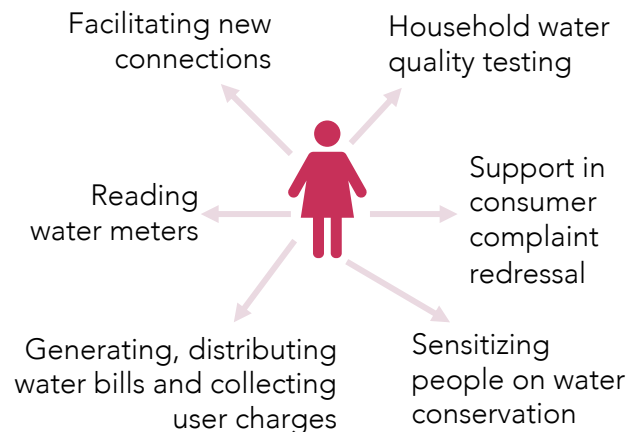


Digital Display Boards have been installed at key public places, for real-time display of water quality data.



Dedicated staff in the form of Jal Saathis have been engaged to act as a bridge between WATCO and the consumers. Among other responsibilities, these Jal Saathis engage with communities to assuage any concerns regarding the quality of water supplied through the DFT system by conducting on-site testing. They also help consumers in registering concerns and complaints, if any.

35 Jal Saathis assigned in 32 wards.
Approximately **1000 households**
covered by each Jal Saathi



Responsibilities of Jal Saathis



Digital Display Board



Jal Sathi generating and collecting user charges



Card machine for instant bill payment



Jal Sathi

Building in-house capacity



Capacity building and on-the-job training is provided at every level, i.e. operator, Assistant Manager, and Manager.



A Center of Excellence called “**Odisha Water Academy**” has been established for **training the workforce** and for continuous capacity building of the staff. The Academy imparts training on various aspects related to the water supply & sanitation sectors, for all level of officials, from operators to policy makers.

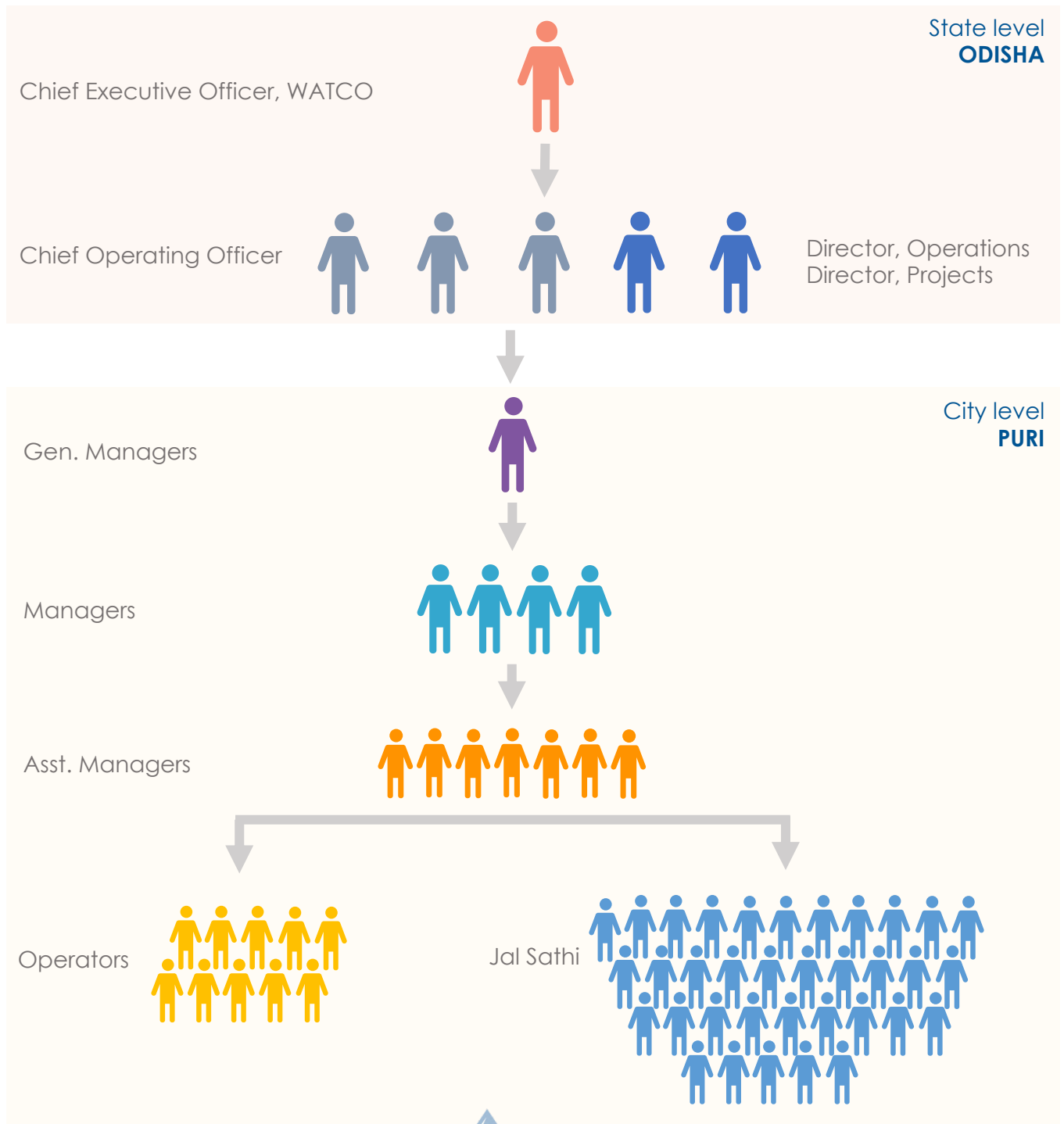


Continuous **national and overseas, training & capacity building programmes** are organised for the staff of WATCO, specially the ones who are involved in the implementation and maintenance of the DFT Mission.



Local plumbers are trained and empanelled with WATCO for installation of household connections as per standards, and to repair all faulty connections and leakages.

Working structure of Water Corporation of Odisha (WATCO)



Efficient Complaint Redressal



A [Centralised Customer Care Centre](#) has been set up with IVRS based automatic complaint logging, transfer to concerned staff for action, and online real-time tracking of redressal. This is linked with the Central Command and Control system for effective management.



Dedicated mobile crew, called the [Quick Response Teams](#), have been deployed for immediate action for plugging leakages, and ensuring quick response to incidence management. These teams are equipped for swift movement to the site with necessary tools and spares. They have the technical competence to handle issues related to water quality, pressure of supply, leakage repair, among others. Two such teams, with dedicated vehicles, are available round the clock for emergency services. These teams are managed from the centralized Command and Control system.



The centralised monitoring and tracking of Customer Complaint Redressal helps in preventive maintenance and quick action.





TECHNICAL ASSESSMENT OF PURI'S DFT SYSTEM



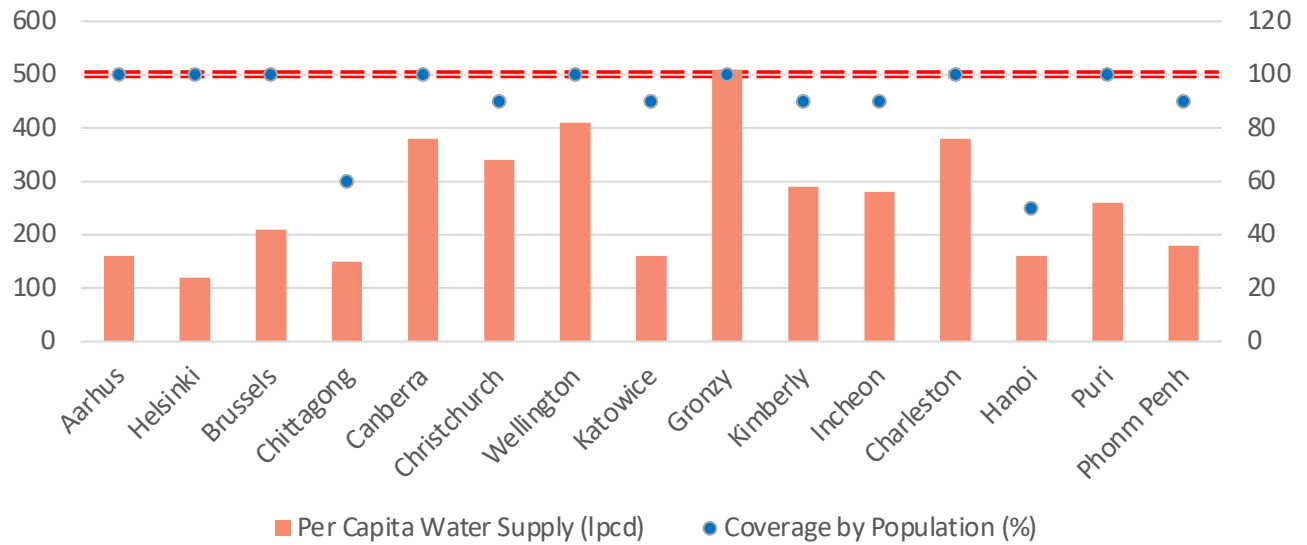
Comparison and Contrast

with similar-sized utilities

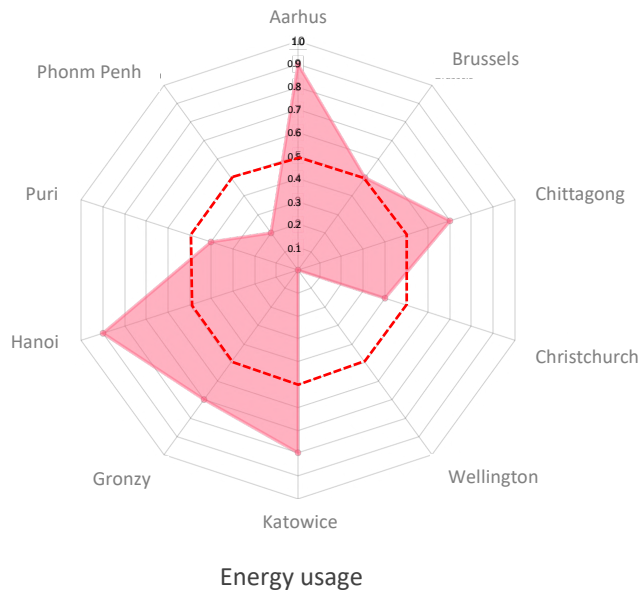
An independent analysis was carried out by the National Institute of Urban Affairs (NIUA) to compare and contrast the DFT system in Puri with other similar-sized water utilities in developed countries, and water leaders in developing countries.



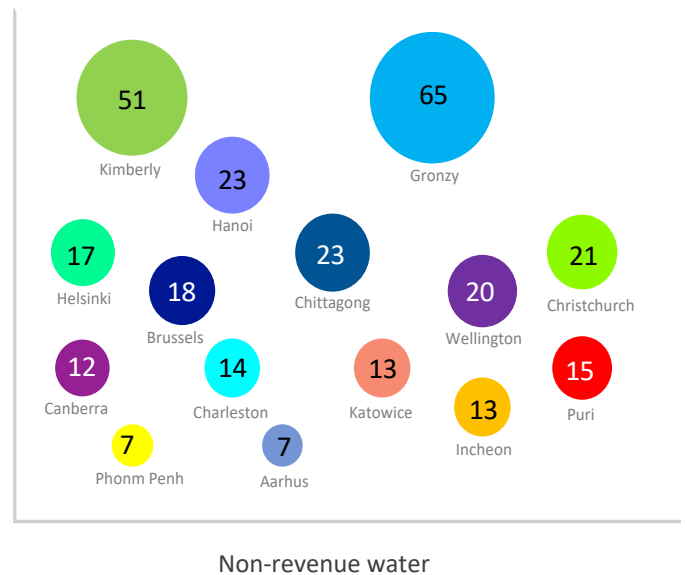
Per capita water supply and water supply coverage



Energy usage (kWh/m³)



Non Revenue Water (%)

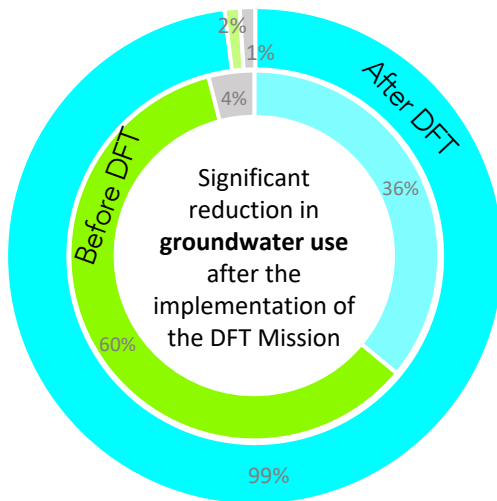


Key Findings of a Consumer Survey

An independent questionnaire survey was carried out by NIUA, in both slum and non-slum households, to evaluate the impacts of the DFT system in Puri. The survey sought information about consumers' perception of the DFT system, their satisfaction with the quality and reliability of services provided, and the socio-economic benefits derived as a result of the DFT system.

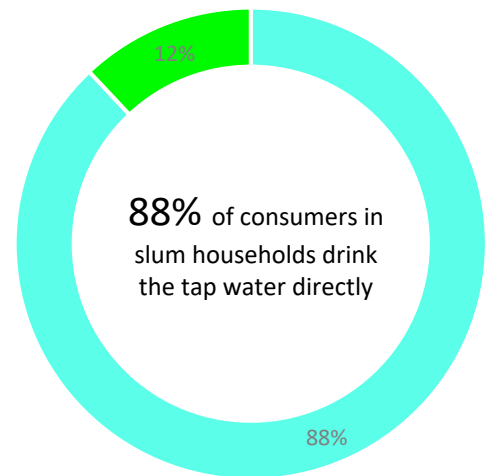
Overall, the results revealed that this scheme has largely benefitted women from slum households in terms of efforts and time saved, which they have been primarily devoting towards household chores since the implementation of this scheme.

Sources of Water



- Municipal Connection
- Ground Water
- Other Sources

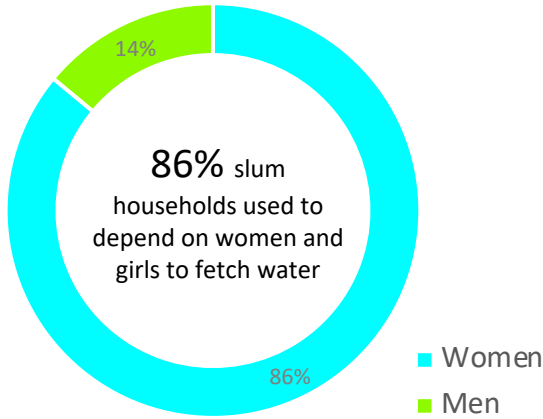
Direct Use of Water



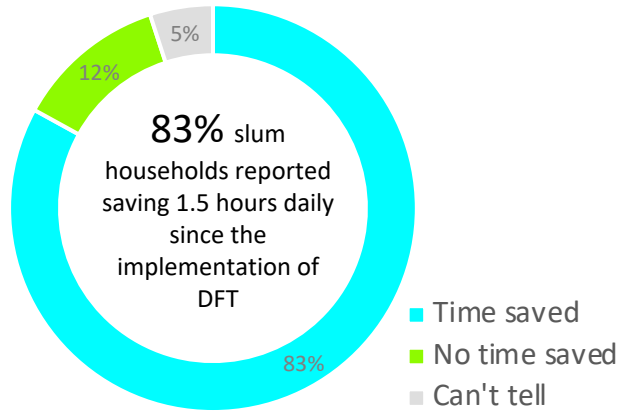
- Drink directly from tap
- Boil or filter before drinking

Socio-economic Impacts

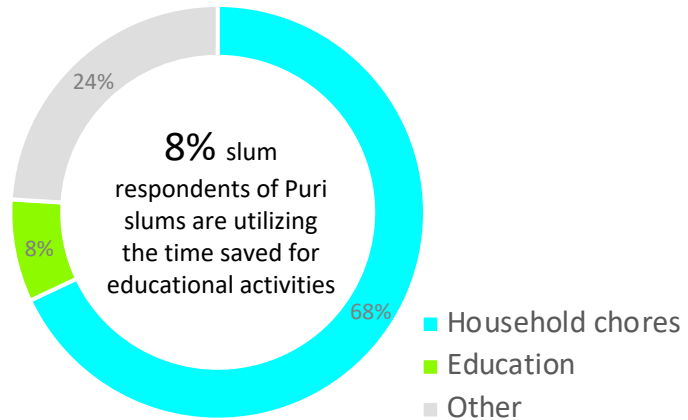
Role of fetching water before DFT



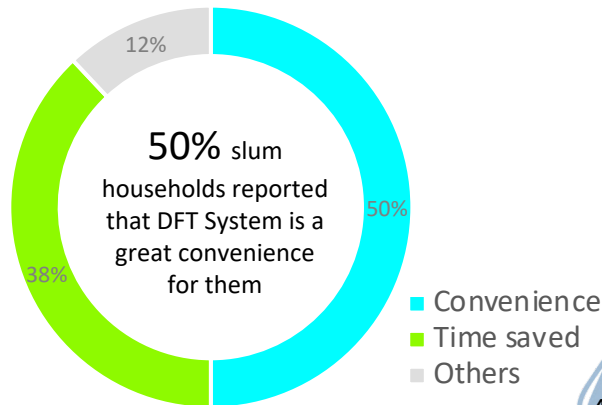
Time saved since DFT



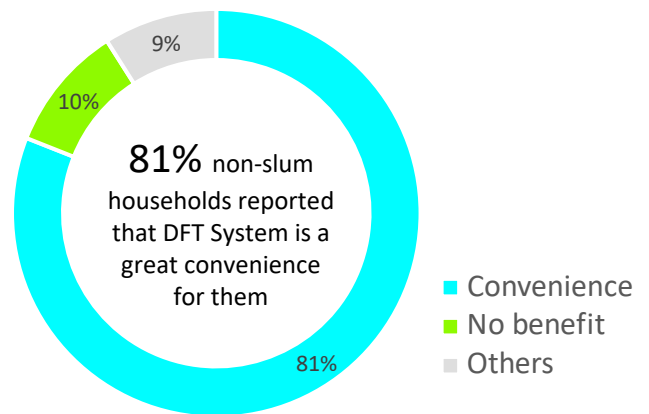
Utilisation of time saved since DFT



Benefits of DFT in slums



Benefits of DFT in non-slums





REFLECTIONS FROM THE PRIMARY SURVEYS



ନିରନ୍ତର ଜଳ ଯୋଗାଣ ଯୋଗୁଁ ଆମେ ବର୍ତ୍ତମାନ ଆମର କାର୍ଯ୍ୟରେ ଅଧିକ ସମୟ ଦେବାରେ ସକ୍ଷମ ଅଛୁ ।
“We can now devote more time into work now, thanks to the continuous water supply”



ସପ୍ତାହରେ 7 ଦିନ ଦିନକୁ 24 ଘଣ୍ଟା ଉଚ୍ଚ ଚାପର ଜଳ ଯୋଗାଣ ଆମ ପାଇଁ ଉପଲବ୍ଧ |
"High pressure water is available 24x7"



SUJAL ପୂର୍ବରୁ ଜଳ ପର୍ଯ୍ୟାପ୍ତ ନଥିଲା | ବର୍ତ୍ତମାନ ଜନସାଧାରଣଙ୍କ ପାଇଁ ଜଳ ପର୍ଯ୍ୟାପ୍ତ ପରିମାଣରେ ଉପଲବ୍ଧ |
“Before SUJAL the water was not sufficient. But now, sufficient water is available for public”

LARGER IMPLICATIONS OF PURI'S STORY





Reference for Other Cities



Puri's journey is a good reference for other Indian cities attempting to [adopt the Drink from Tap model](#).



The DFT system exemplifies the use of local knowledge, resources, and technologies.



The Government of Odisha has been able to [envison both short-term as well as long-term plans](#) for water supply. It is this vision that has helped them leapfrog from intermittent water supply to the drink from tap model.



This Mission is not just restricted to technical transformation, rather it encompasses active engagement with the citizens. The success of the mission lies in the [integration of technical expertise, efficient government machinery and effective ground-level action](#).



The greatest takeaway from the Puri story is that [disadvantaged communities now have access to top quality drinking water in their premises](#), at any time of the day and night. Unlike the other sections of society, these communities typically rely solely on Government interventions to improve their quality of life.

Going forward, some of the focus areas for the DFT System in Puri and rest of Odisha include:

01

Drawing up long-term sustainability plans, in order to scale-up the mission to other cities in Odisha

02

Establishing a generalized monitoring mechanism to evaluate the impact of the scheme

03

Improving cost recovery

04

Adopting alternate sources of water, such as treated wastewater



Awards and felicitation



Distinction of Global Water Leader Award 2022, received at Global Water Summit on 17th May 2022 in Madrid, Spain



ISO Certification for water quality





“DRINK FROM TAP”



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