Cities, WASH and Urban Planning: From challenges to emerging opportunities

International Assembly on Water Sensitive Planning for Cities in the Cities in the Global South SPA Delhi

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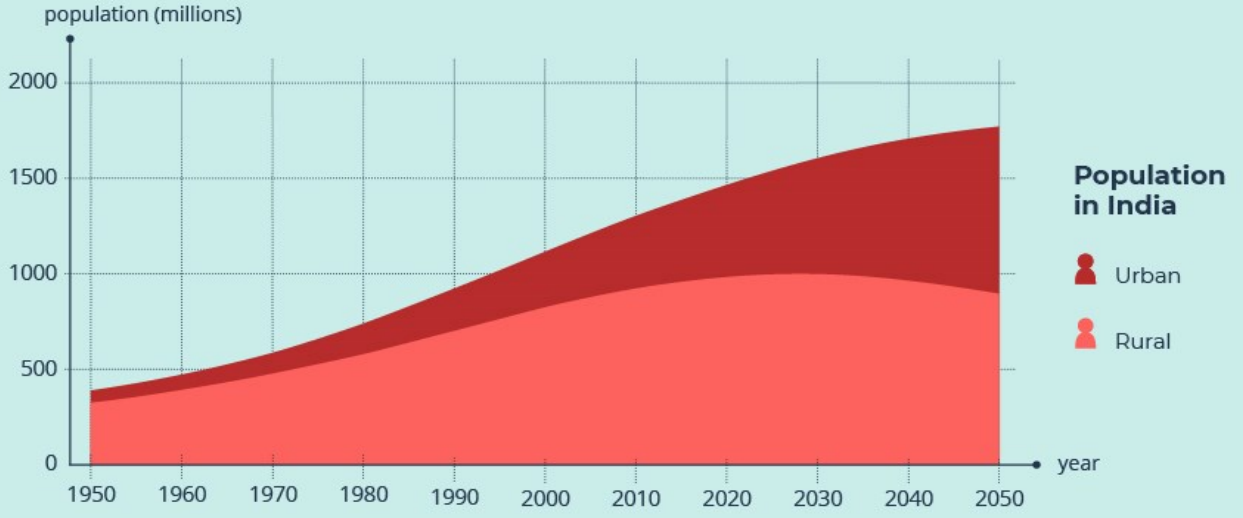
India is becoming more and more urban

Around 2030, the rural population will decline while the urban population will rise rapidly

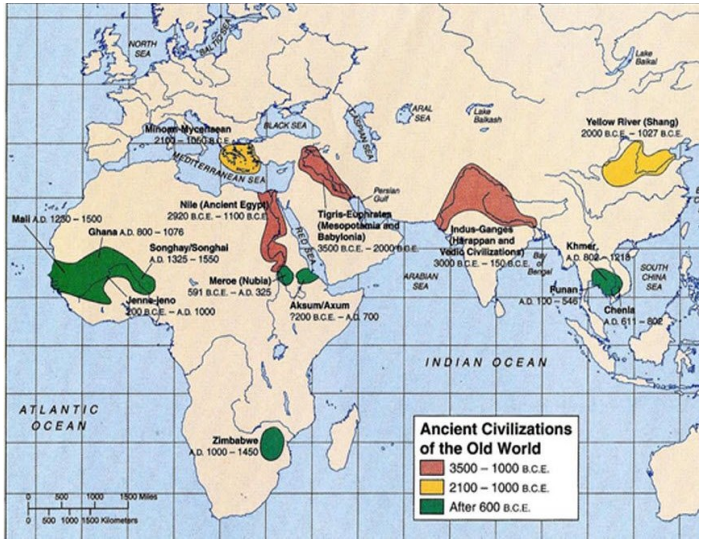


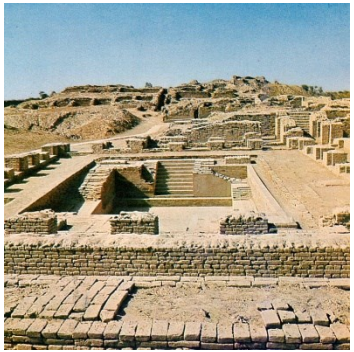
Source: UN DESA, Urban and Rural Population India (2018)
World Urbanization Prospects: The 2018 Revision, custom data acquired via website

URBANET

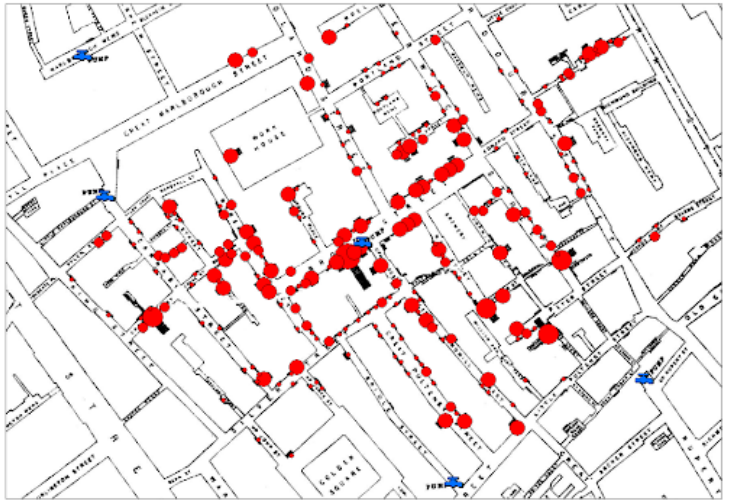
WASH – an essential concept in urban planning for ages

Major civilizations and cities developing around rivers

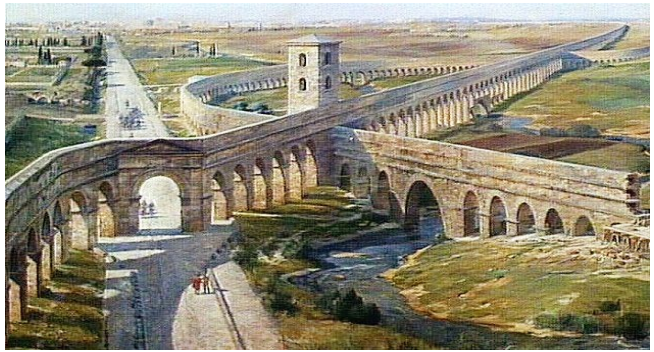




The Great Bath in Harappa and Roman Aqueducts



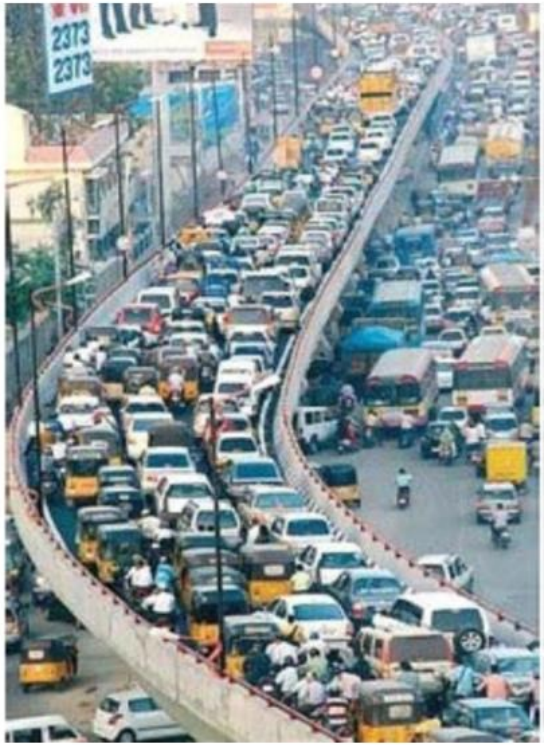
Excellent aqueducts, a symbol of stupidity?



Physician John Snow links spread of cholera to a polluted water pump during the 1854 Broad Street cholera outbreak in the United Kingdom.

However, more recently - Conventional Urban Planning has focused more on land use management and road networks

- Land use and transportation planning (roads and parking) is the key core focus of city planning
- Key assumption that all infrastructure will follow the road network
- Not always the best suited for water, storm water and sanitation system, often lead to
  - Water demand to be met from distant sources
  - Keep on building more and more water infrastructure – regional imbalance
  - Ignoring hydrogeology and groundwater in mainstream planning
  - Lakes dry up then are taken over for development



Water Sensitive planning is being discussed at this conference

Drawing on our work, we focus on three areas:

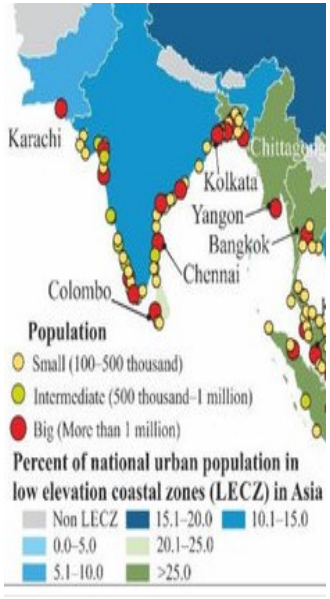
Climate resilience

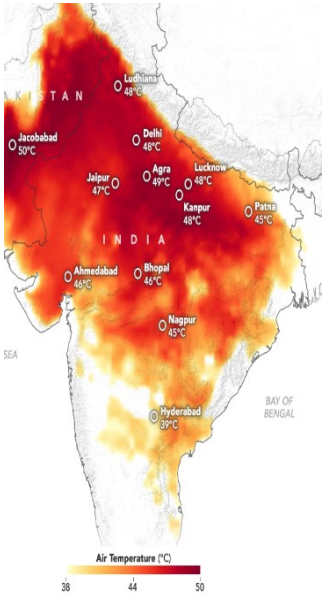
Inclusion and Gender

New forms of financing and monitoring

1 Climate Resilient WASH

Drought and stress on water supply	Floods and threat to life, infrastructure and economy	Sea level rise and threat to coastal cities	Heatwaves and carbon emissions	Inequality and resultant vulnerability









Safe Water Supply and Sanitation - Need of the hour ...

12% of India's population already living the **DAY ZERO** scenario with respect to water. "21 major cities are racing to reach zero groundwater levels, affecting access for 100 million people" --- NITI Aayog

The **AVERAGE** citizen receives **114 LPCD** but more than **40% CITIES** supply less than **70 LPCD**

POOR SANITATION in India is estimated to cause **6.5% GDP LOSS** according to a World Bank study.

98% CITIES ODF but by some estimates upto **81% OF WASTEWATER UNSAFELY DISPOSED**

... especially in context of climate vulnerability and resilience

India is **7th most climate vulnerable** country in the world due to its diverse ecology!

New role for urban planners?

Move from …

… to …

Infrastructure provision → Ensuring Services → Climate response → Climate resilience

Need to move away from conventional approach

CONVENTIONAL APPROACH

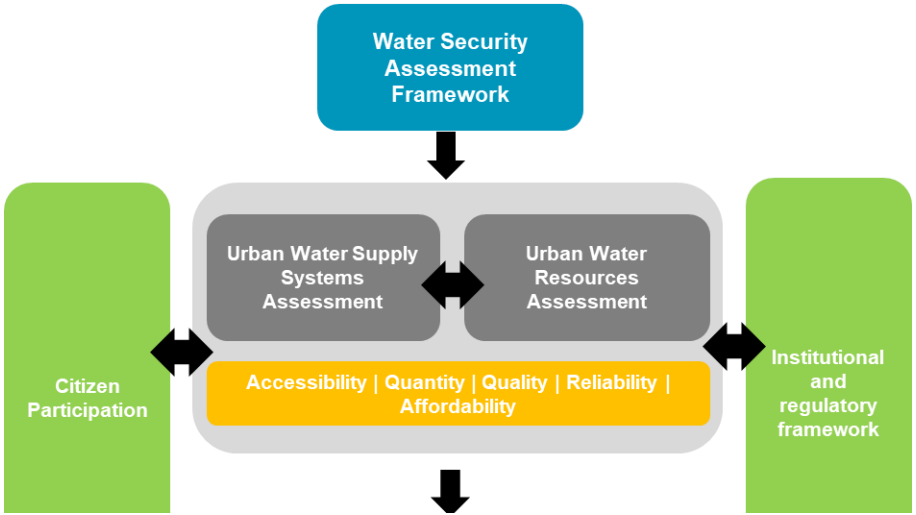
- Supply side management
- Planning at city scale
- Transportation of water from distant sources of water
- Building New infrastructure
- Different sectors of water cycle managed separately
- Lack of participatory approach

INTEGRATED APPROACH

- Both supply side and demand side management
- Planning at watershed scale
- Augmentation of local sources, Exploring alternate sources
- Increasing efficiency of existing systems
- Entire water cycle is treated as one unit
- Integrated and participatory approach

Experiences of Urban Water Security Planning in Gujarat

"Water Security is access to water for all basic human needs in adequate quantity and quality, which is reliable and affordable."



Urban water security management framework and toolkit

More information: [CWAS - Urban Water Security Management Toolkit]

Water security is ....

Reliable and Affordable Access

of adequate

Quantity | **Quality**

of water for

Basic Human Needs | **Livelihoods** | **Local Ecosystem Services**

with a

Well managed risk of water-related disasters

Need to focus on ....

Municipal service efficiency

- Access to all
- Non-revenue water
- Equity in services

Source sustainability

- Groundwater management
- Rainwater harvesting
- Reducing distant source dependence

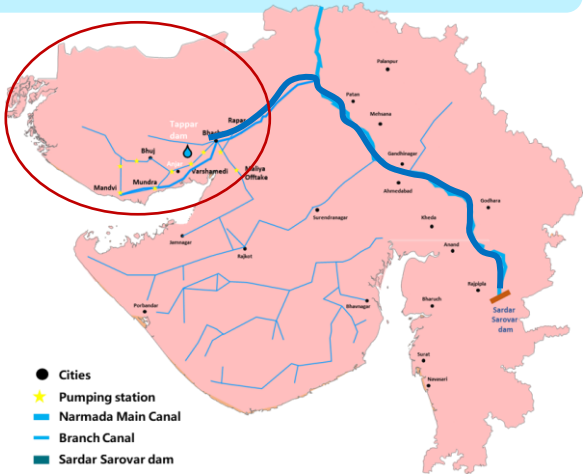
Climate resilience

- Avoid “Day Zero” Erratic rainfall
  - Urban flooding
  - Coastal and mountain risks

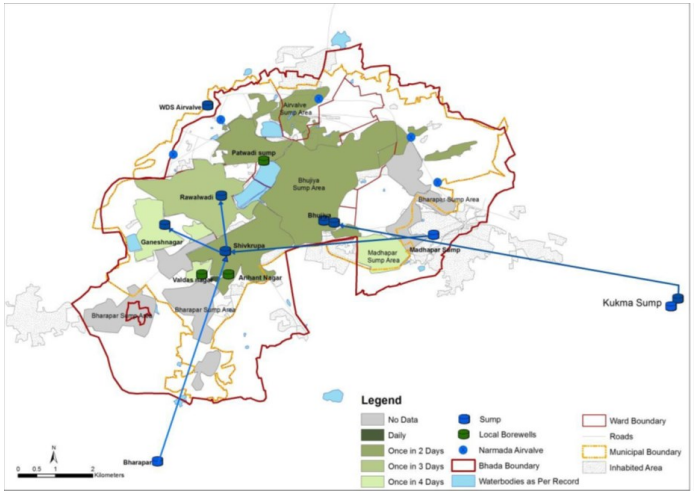
Circularity and re-use

Source sustainability and municipal service efficiency ?

Water from distant sources …



And yet, Kutchh cities not able to supply water daily …



Private water markets…

Need to strengthen own water sources!

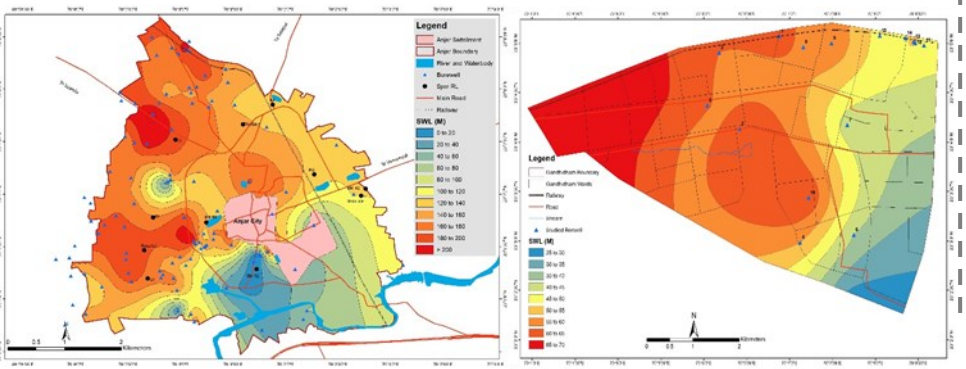
Non-water days …

Geohydrological study for understanding aquifer and watershed of cities

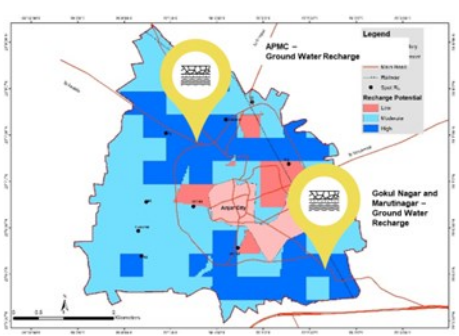
APPROACH FOR GEOHYDROLOGICAL STUDY

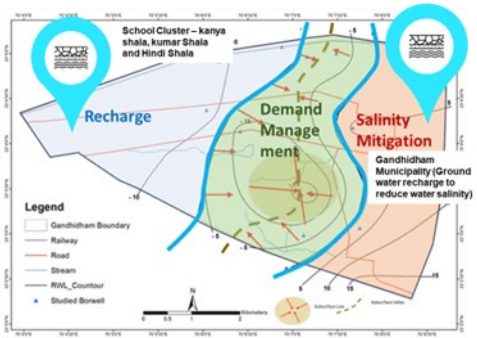
WATER SOURCE STUDY → **PLANNING FOR PILOT DEMONSTRATIONS** → **COMMUNITY ENGAGEMENT**

Ground water level and contour maps

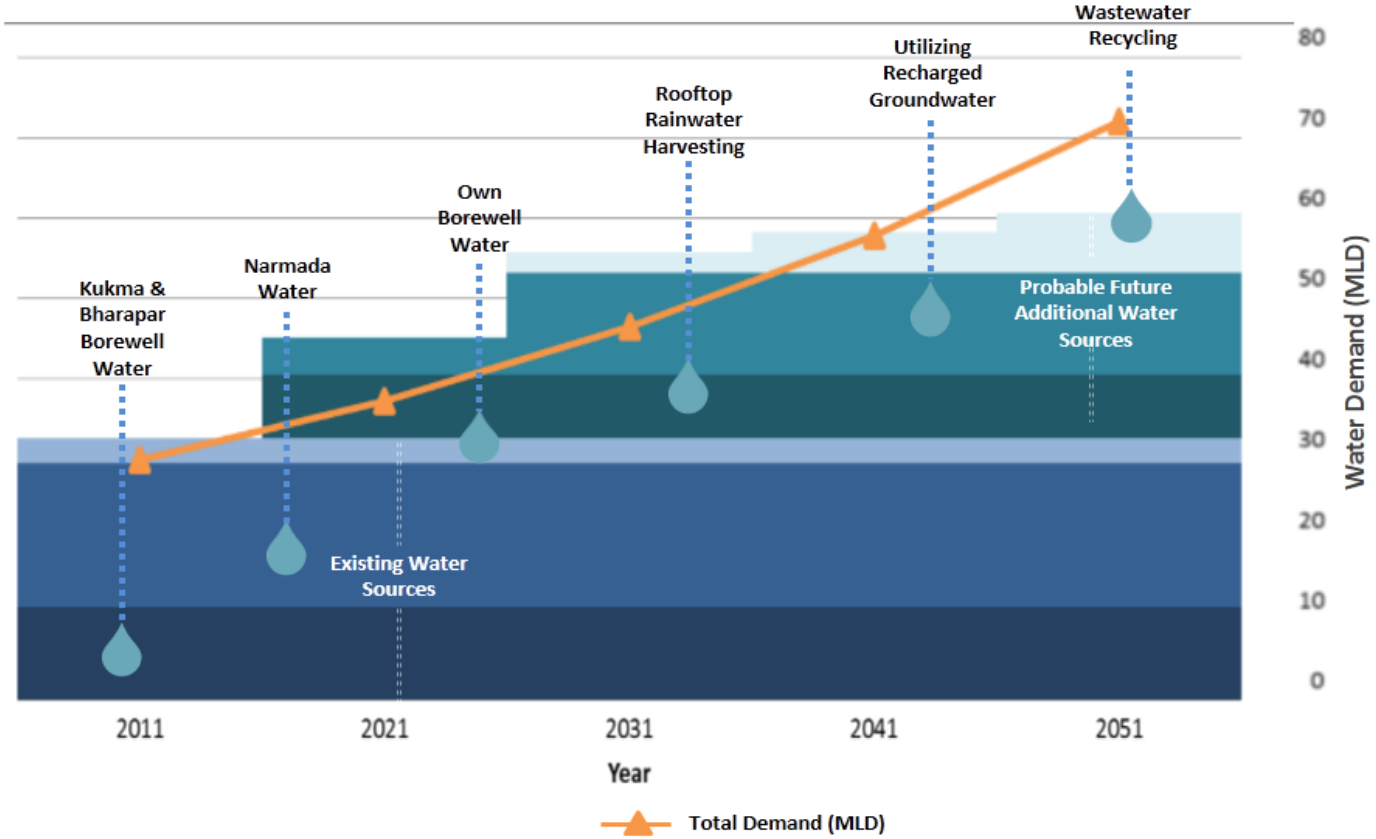


Potential rainwater recharge sites





Envisioning a water secure city



More information: [Rethinking Urban Water Management - Lessons from Bhuj]

Measures to move towards water security and reducing urban flooding through water recharge / water harvesting projects

Ironical situation-
floods vs. water scarcity

On the one hand there is **acute water scarcity** and on the other, the **streets are often flooded** during the monsoons


THE TIMES OF INDIA

Rains pound Gandhidham, Anjar towns in Kutch

TNN | Jul 12, 2020, 04.32 AM IST

Rajkot: Heavy rain lashed Kutch's commercial city Gandhidham and Anjar on Saturday evening causing severe water-logging in many areas. However, the people welcomed the rain that gave them some respite from the humid heat.

Frequent **Urban flooding** scenario in arid regions

Pilot Demonstrations
Adaptive measures for: Water security and Mitigating urban floods

Rainwater Harvesting

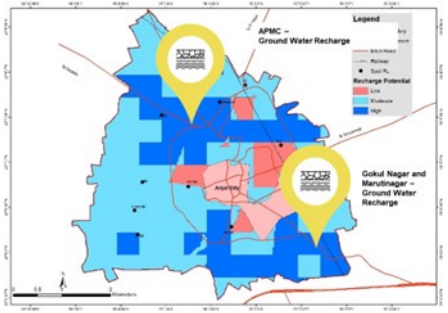
Rainwater harvesting in schools for drinking water supply

Groundwater recharge

Flood control through GW recharge for housing colonies

Scaling up plan

Urban Watershed Delineation
Groundwater Recharge Potential Map
at city level



Revival of traditional lake catchment system; Well rejuvenation

35 Million liters **of ground water recharged during monsoon**

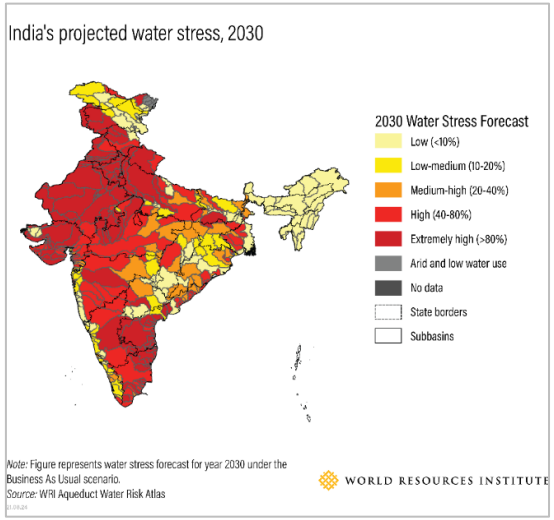
Circularity - Why “Waste Water”?

Until very recently….
~80% of wastewater in India was untreated

Treated or untreated …
This water is let out in our rivers and water bodies

Meanwhile 54% of India faces high water stress

…but without treatment, there is little scope for reuse!



Now, Govt. programs focusing on 100% treatment in all cities with financial outlay – an opportunity with enabling environment ….

AMRUT 2.0
Making Cities Water Secure

स्वच्छ भारत 2.0
एक कदम स्वच्छता की ओर

More treatment plants	More generation of treated water	Huge potential to tap!
AMRUT 2.0 and 15th FC indicate 20% reuse	Challenge fund for Million+ cities to achieve	Reuse conditions to achieve WATER+ status

Sinnar: reuse of water for development of garden and urban forest

- **8000 square** meters of urban forest and landscaped area in midst of barren land
- **1400 trees of 16+ species** planted
- Treated **water** is used for **watering the plants** through a **drip irrigation system**
- **Sludge used as fertilizers at the urban forest or taken away by farmers.**
- The **quality** of the treated products are **regularly monitored** through testing the samples.
- The landscaped area was designed by professional landscaping consultants.

More information: [Sinnar – A model city for sanitation]

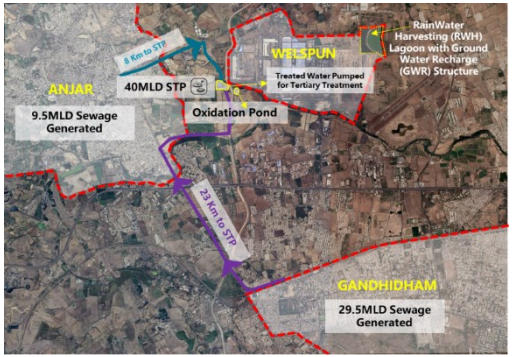
Maximizing reuse with upcoming STPs and used water management – great potential for Maharashtra…

Industrial use

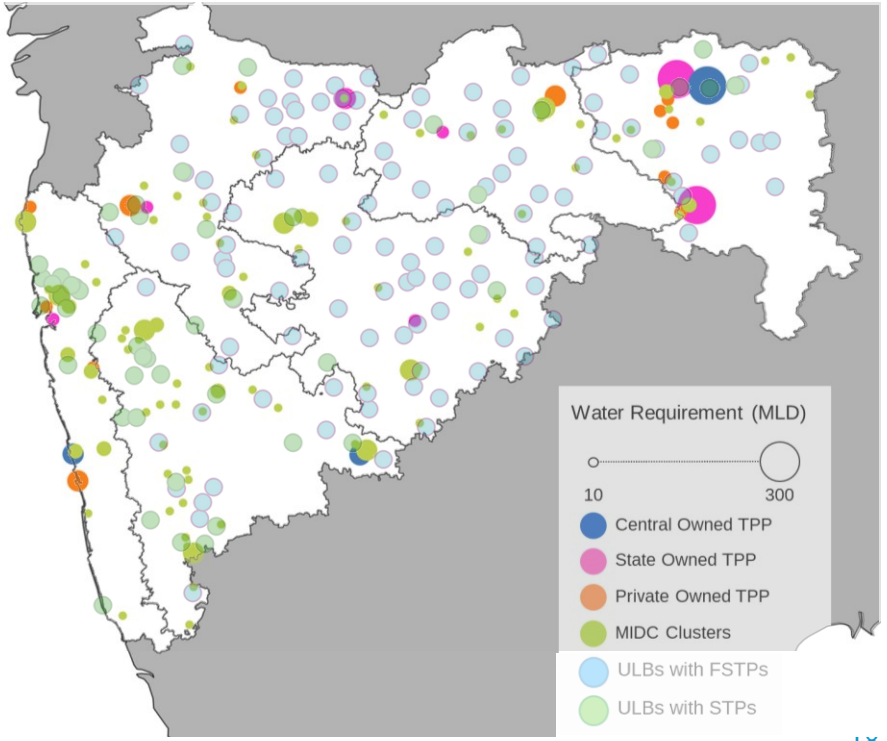
Example of Nagpur – 90% treated water reused. Tie ups with NTPC and Mahagenco

Maharashtra reuse policy - municipalities responsible for recycling wastewater and reusing treated wastewater in thermal power plants, industrial estates, and for other non-potable purposes

Example from Gujarat – Welspun set up STP to treat water from Anjar and Gandhidham for own industrial reuse. Cities generating revenue from selling sewage.



Maharashtra STPs and industries



Making WASH services Carbon Neutral - across the service chain

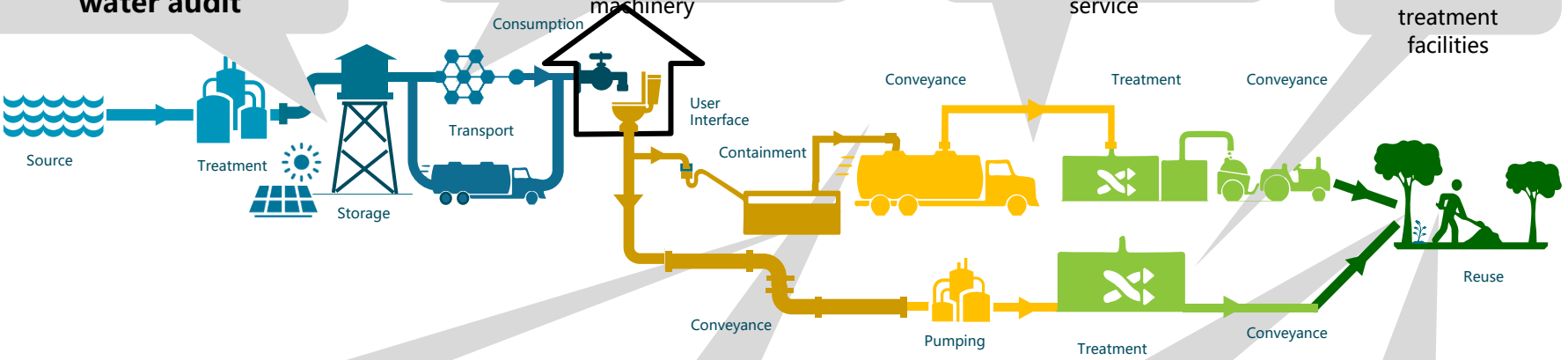
Supporting Cities in Maharashtra: Karad, Vita, Ichalkaranji, Wai, Sinnar, Satara

Assessment of water and sanitation services and emissions in operations – **energy and water audit**

Use of clean energy such as **solar power** for various WASH operations. Use of energy efficient machinery

Piloting use of **electric / solar energy truck** for septic tank desludging service

Methane capture units at treatment facilities



Equitable and citywide inclusive services - Plan for **citywide scheduled desludging service** in consultation with city governments

Safaimitr suraksha - **Sanitation worker safety training and sensitization**

Gender Empowerment - Plan for involving SHGs in consultation with city governments – **NULM convergence**

Urban forests as **carbon sink units** at treatment facilities

Demonstration of renewable energy at Infrastructure level

Installations at
Water Treatment Plant

Installation at
Faecal Sludge treatment plant

Installations at
Centralized and Decentralized
Wastewater Treatment plants

Scaling this to the State through Majhi Vasundhara and SBM

Reducing by **16 %** dependency on conventional energy source of municipal services

Over 25 years:

Clean energy generation potential

8550 MWH

Emission reduction Potential

7,011 tons CO2

** City population ranges between 50k – 400 K*


Satara : 30 Kw


Karad : 72 Kw


Ichalkaranji : 81 Kw


Wai : 30 Kw


Sinnar : 15 Kw

Projected Overall cost saving in 25 years: INR 60 million

2 Inclusion and Gender

Ensuring ‘Last Mile Connectivity’

Ensuring and enhancing role of women SHGs and councillors

Supporting upliftment and safety of marginalized groups such as sanitation workers

AMRUT 2.0 reform in India focuses on “Har Ghar Nal” and “Har Nal me Jal”

- **AMRUT 1.0** focused on **500 cities** for providing services of water supply, sewerage infrastructure, storm water drainage, urban transport and development of green spaces and parks.
- **112 lakh HH water tap connections** were provided under AMRUT 1.0 in 500 cities
- A major objective of AMRUT 2.0 is **to move towards universal access to household level water tap** in all 4700 statutory towns of India

Guidelines of AMRUT 2.0

To provide 2.68 crore new tap water connections to all in all 4,700 statutory towns of India

Universal HH coverage of **sewerage/ septage services**

Rejuvenation of water bodies & urban aquifer management

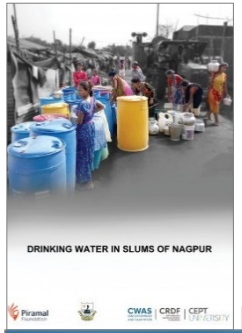
Recycle and reuse of treated wastewater

Major reforms in water supply sector such as **reducing NRW** to below 20%; **24x7 water supply**

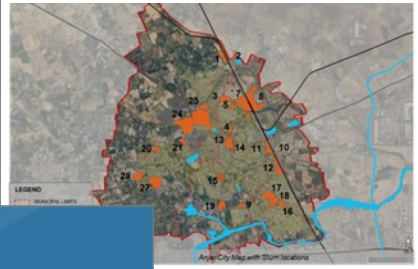
Source: A Mission for Fulfilling Aspirations, Transforming villages, Har Ghar Jal, Jal Jeevan Mission, 31st Dec 2021

Need to assess dimensions of water vulnerability especially in slums

Availability | Reliability | Accessibility | Quality | Affordability | Community



Water vulnerability in slums of Nagpur

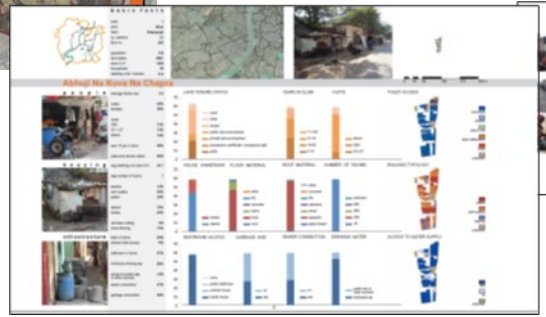


Water stress in slums of Anjar and Gandhidham

Lessons from slums in Mumbai

Example of Inclusive Ahmedabad - provision of basic infrastructure to slums

- "inadequate sanitary and drinking water facilities" part of Ahmedabad's definition of slum in Slum Free City Action Plan under the Rajiv Awas Yojana
- Bringing existing slums within the formal system and enabling them to avail of similar level of basic amenities as the rest of the town/ city
- Mapping of slums for integration of spatial , socio-economic and bio-metric Information for creating a GIS enabled slum MIS



More information: Slum Free Ahmedabad

Last Mile Connectivity: universal access to household water connections

Three key challenges:
Review of city experiences under the AMRUT Program

Administrative and Legal Barriers

- Multiple departments involved
- Too many documents required
- No Application Tracking System
- Tenure requirements for basic services
- Lack of citizen awareness
- Complex, lengthy approval procedures

Cost Barriers

- High connection costs for new connections
- High water tariffs

Infrastructure Barriers

- Lack of internal distribution networks

Source: CWAS (2023) Last Mile Connectivity for Water Supply. Available at: https://cwas.org.in/cwas-resources/last-mile-connectivity-for-urban-water-supply-services

Measures to improve coverage of household water connections

Improving spatial coverage and providing access to all

- Extending network coverage and providing household water connections
- Include water supply network in slums and low-income areas in Detailed Project Report (DPR)
- Identify and regularize unauthorized connections

Alleviating legal and administrative barriers

- Reducing required documents and easing the application process
- Delinking provision of water connection from land tenure
- Introduce centralized database systems

Affordable connection charges and water tariffs

- Include connection charges in instalment in the water tax or bills over time
- Exclude additional costs of road cutting and plumbing charges
- Reduce charges for slum households and urban poor
- Explore credit for water connections
- Generate awareness and adopt participatory process/outreach to the poor

Source: CWAS (2023) Last Mile Connectivity for Water Supply. Available at: https://cwas.org.in/cwas-resources/last-mile-connectivity-for-urban-water-supply-services

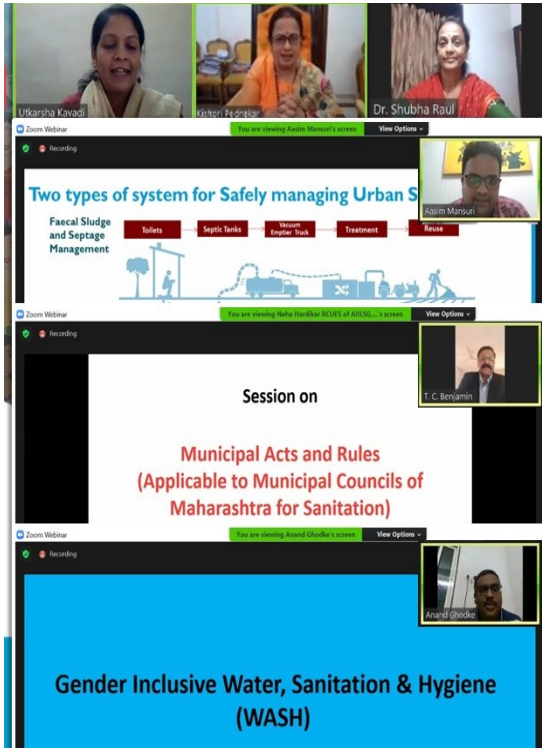
Scheduled Desludging service – Inclusive and equitable service

- Includes those not connected to sewer networks – both slum and non-slum properties
- Mandatory desludging service but not linked to "user charges" – service to ALL
- Special care to service vulnerable areas – long pipes for narrow lanes
- Equitable - no charges at time of desludging - benefiting low income areas - sustainably financed through equitable "sanitation tax"
- Mechanized safe desludging – Safety of sanitation workers

More information: Citywide Inclusive Sanitation through Scheduled Desludging Services: Emerging Experience from India , Scheduled Desludging of Septic Tanks in Wai , Impacts of scheduled desludging on quality of water and wastewater in Wai city, India

Strengthening the role of women councillors and presidents

Webinar for Women Elected Representatives (Presidents) for ULBs



Division level orientation workshop for newly elected women representatives in Nagpur

City level orientation workshop for elected women representatives in Wai

More information: Gender Inclusive Initiatives: Examples from Maharashtra

SBM-NULM convergence in Maharashtra: City led approach facilitated by the State Government

Sanitation-based-livelihoods for SHGs

- **270+** ODF++ cities
- **220** operational FSTPs
- **500+** MRF and waste compost facilities etc.
- **~1 lakh SHGs** in the state of which 90% are active

Capacity support for by SHGs

- **SHGs willing** to participate in sanitation related activities
- Need support **tendering process, financing** etc.

State policy and guidelines formulated

- State level **working group** formed by the **DMA, GoM**.
- **State level strategy** and **business model** developed

City led approach facilitated by State

- Proactive cities **engaged** SHGs in **SWM and FSSM** related activities.
- **"SHG only tenders, support and trust** from ULB needed to sustain engagement

Inclusion – Sanitation Workers' Rights: Dignity and Safety at workplace

Focus on Safai Mitra Surakshit Shahar Under SBM 2.0

SafaiMitra Suraksha: Zero fatality in sanitation work

- ✓ SOP for cleaning septic tanks and sewers
- ✓ Technology challenge
- ✓ Norms and protocols for equipment and workforce

Access to Infrastructure, PPEs and regular health camps

Skill building and training of San-Workers

IEC campaigns

500 Cities have declared themselves **SafaiMitra Surakshit Shehar**

3 New forms of financing and ensuring sustainability

Urban infrastructure has been generally financed through public funds but innovative options are emerging

Own sources, Transfers and programs

- Taxes, fees, user charges
- Public sector programs
- State and Central Transfers
- Grants from Finance Commissions and SFCs

+

- Philanthropic Funding, CSR
- Private sector investment
- Social Impact Investors
- Market Borrowing

- Output Based Aid
- Blended Finance
- Impact Bonds
- Municipal Bonds
- Repayable Finance
- Crowdfunding

- ✓ Additional funding
- ✓ Efficiency of private sector
- ✓ Performance linked approaches
- ✓ Social & environmental impacts with emerging global interest in impact investing

Need to tap impact investment for WASH and Urban Planning

Figure 2: Source of Funds for Impact Investment Fund Managers, 2012

Source: GIIN, J.P. Morgan

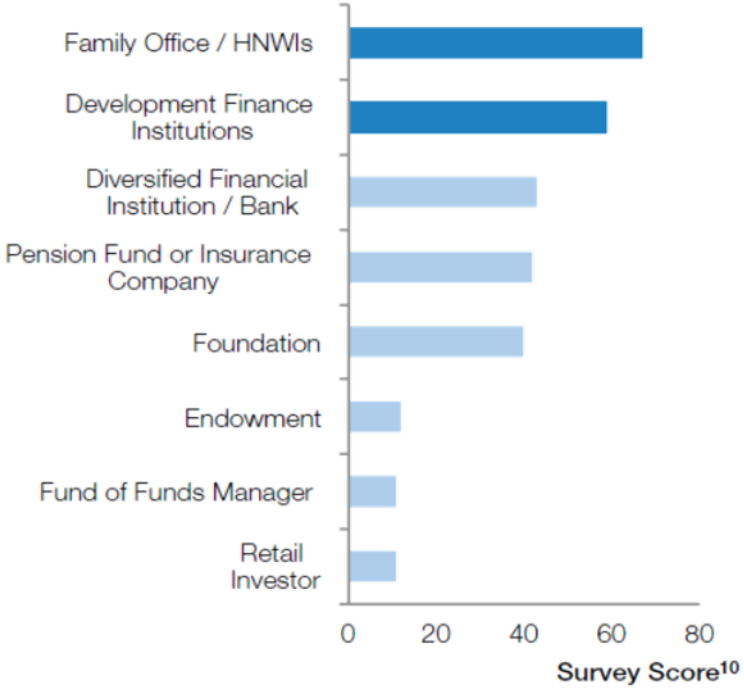
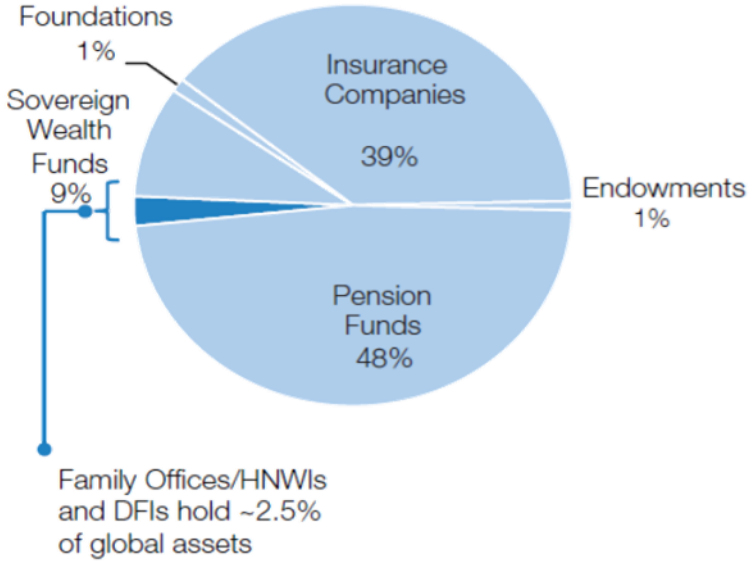


Figure 3: Distribution of Global Asset Ownership, by Investor Type, 2011

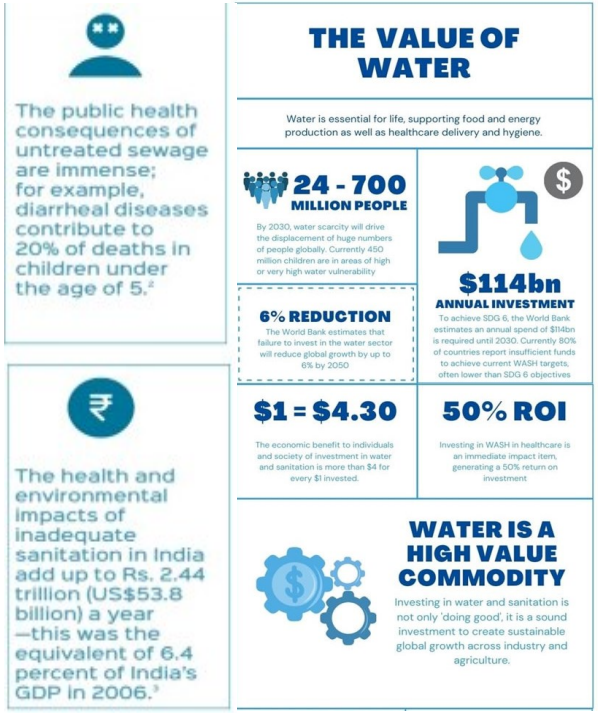
Note: Omitted from the analysis include Mutual Funds, Asset Management Divisions of Bank and Fund Managers (Private Equity, Hedge Funds, etc.)
Source: OECD, Foundation Center, NACUBO, Overseas Development Institute, Deloitte Analysis



Source: Monitor Institute (2009), "Investing for social and environmental impact: A design for catalyzing an emerging industry", Snapshot

What is needed to get impact investors to cities and to WASH?

Advocacy and research around impacts of investing in WASH



Relevant instruments for promoting impact investments

Programs to align investor interests and national goals/programs

- Improving access to WASH in public facilities
- Improving access to WASH through affordable household financing
- Improving water infrastructure and management
- Increasing access to non-sewered sanitation services
- Increasing access to sewered sanitation

Exploring ESG ratings for Indian Cities - For accessing impact finance

ESG Assessments, disclosures and investing

- Measuring sustainability and societal impact to better determine future performance
- Popular in corporate but city governments are also adopting
- Access new markets for development funds
- Build credibility for investors

Toronto's Debt Issuance Program linked to strategic ESG outcomes and reporting

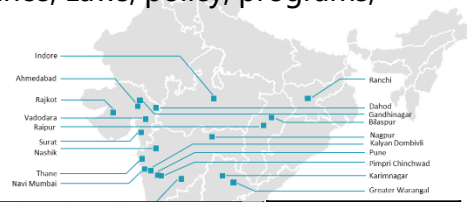
US Municipal Bond marketplace - ratings and data for all cities by ISS ESG Muni QualityScore (formely ACRe Data)

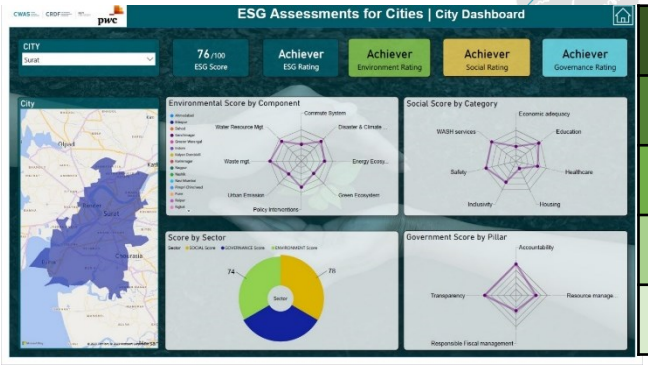
ESG for Indian cities - Framework by CWAS and PwC India

Indian cities already reporting on multiple ESG relevant topics as part of govt. initiatives – publicly available data

Framework with 19 themes, 62 indicators - City mandates, service performance, Laws, policy, programs, national commitments

Tested on 20 cities
- ESG ratings, profiles





Source: ESG assessments for cities in India , CWAS, 2023

Options to leverage private resources and impact investments

Outcome based funding

Funders make payments only if / when pre-agreed outcomes are achieved

Blended finance

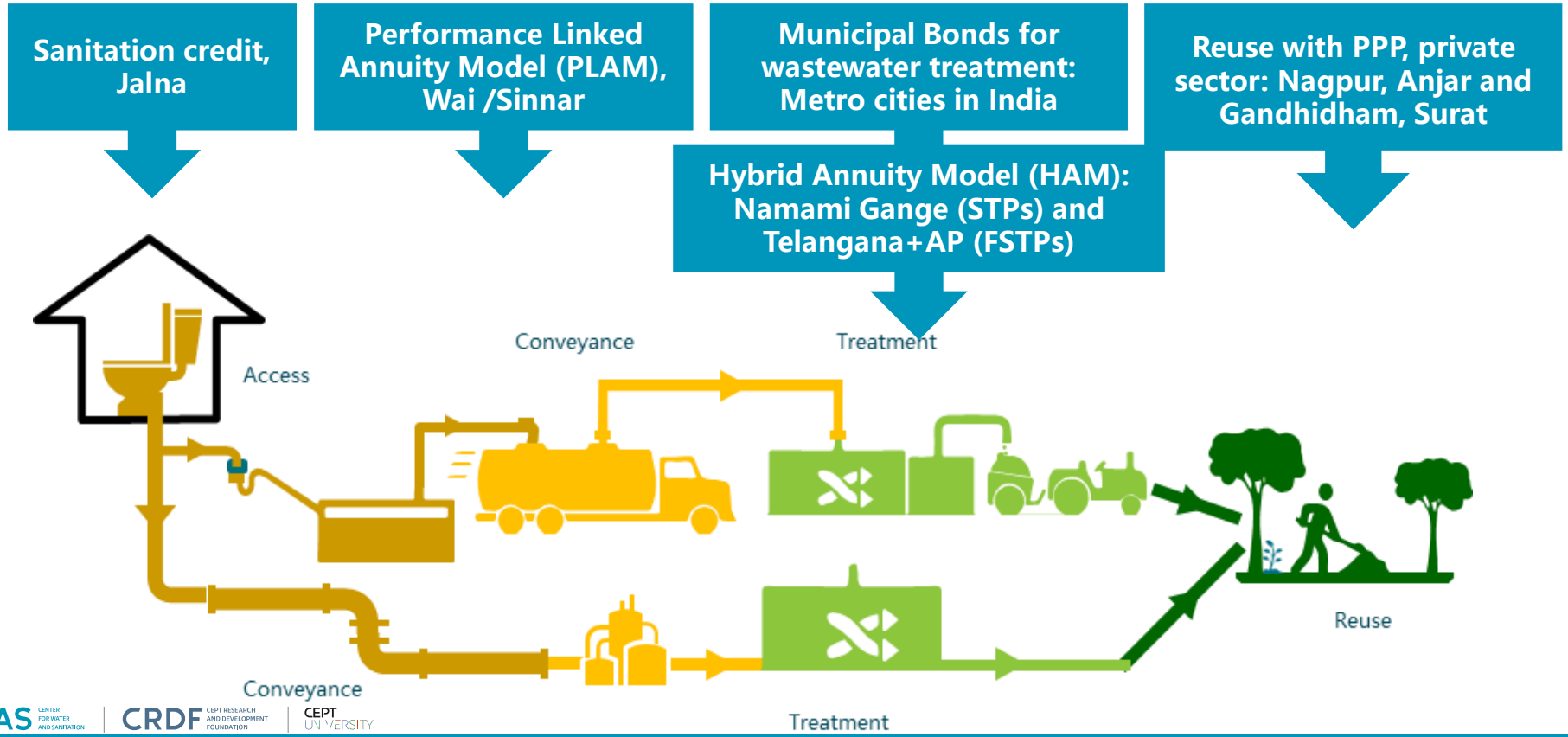
Leveraging private capial (with returns) by using public funds to achieve development outcomes

Municipal / Green Bonds

Accessing debt market resources and other private investments for 'green investments' in cities

Source: Social India Finance presentation, 2020; Convergence and the Brookings Institution (2017) "Impact Bonds in Developing Countries: Early Learnings from the Field"

Blended Finance: examples of commercial finance mobilized across the sanitation service chain in India



Greening of public infrastructure investments

SBM 2.0

स्वच्छ भारत
एक कदम स्वच्छता की ओर

More emphasis on **reuse**

Ensure **universal coverage** of **toilets**

AMRUT 2.0

अमृत
Atal Mission for Rejuvenation and Urban Transformation

Should have more focus on **water security**

- **Rain-water harvesting** structures
- **Aquifer** management
- **Flood control** and management

Development of **green spaces**

Green Initiatives by GoI

भारत सरकार
GOVERNMENT OF INDIA
सत्यमेव जयते

Green Credit Scheme is environmental and climate friendly but needs **strong regulations** to work to avoid greenwashing.

Carbon Credit Trading Scheme to reduce GHG emissions with strong regulatory market to buy and sell carbon credits.

Urban Infrastructure Development Fund: Under the UIDF, climate adaptive plans and projects should be prioritized under this fund for **Tier 2& 3 cities** *(NABARD has a dedicated National Adaptation Fund for rural projects)*

Source: SBM 2.0 guidelines, 2021, AMRUT 2.0 guidelines, 2021, UIDF Model Guidelines, Union Budget 2023-24

Improving municipal finance for urban local bodies...(1/2)

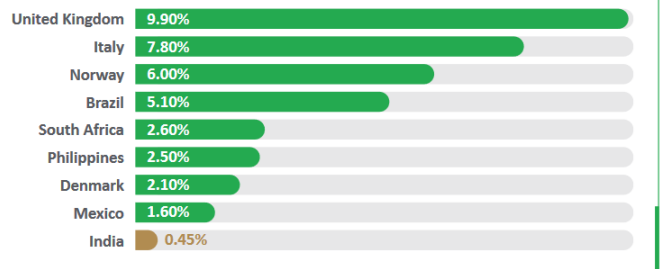
"Indian cities will require an investment of **$840 billion** in the areas of infrastructure and municipal services till 2036 to meet the needs of its fast-growing urban population"

-Recent estimates by World Bank in the report Financing India's Infrastructure Needs: Constraints to Commercial Financing and Prospects for Policy Action

Need to focus on greater transfers (through Inter govermental grants) to ULBs...

- Indian cities contribute **2/3rd of GDP** but are fiscally poor

Figure 10: **IGT to Municipal Governments as a Proportion of GDP**



Sources: UK, Denmark, Norway, Italy and India – Mohanty (2016) as cited in Ahluwalia et al. (2019) p.11; Brazil – Organisation for Economic Co-operation and Development (OECD) (2016a); Mexico – OECD (2016b); South Africa – OECD (2016c); Philippines – Diokno-Sicat, J. (2019) p. 10

- Making IGTs predictable and untied.

Share of ULBs in GST?

- Cities do not get any benefit from their economic vibrancy as all the buoyant local taxes – such as the octroi, entry tax and local body tax – have been abolished.

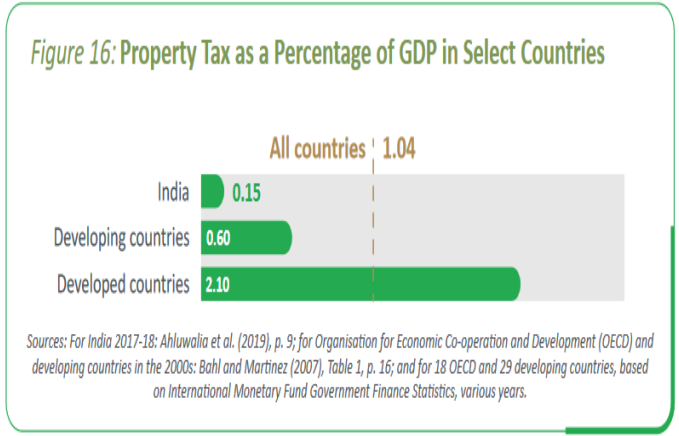
- "...sharing of the revenues from GST among all three levels of government."
- Need for a Separate list of revenue sources for local governments in the Constitution?

Sources: CWAS (2020), " Strengthening finances of Municipal governments" ; and World Bank (201), "Financing India's Infrastructure Needs: Constraints to Commercial Financing and Prospects for Policy Action"

Improving municipal finance for urban local bodies...(2/2)

Significant untapped revenue from property taxes and other own revenue sources of ULBs

Municipal strengthening for improved property tax collections...



- Linking Property Tax Base to **Market Prices**
- Continued Focus on Reforms to **Increase Coverage and Collection Efficiency** of Property Tax

Incentivising local governments to improve own revenues

Performance grants to ULBs

- **Improved data collection** through audited accounts
- Improvement in **own revenues**
  >90% property tax and water tax collections
- **State level incentives** as by Government of Maharashtra

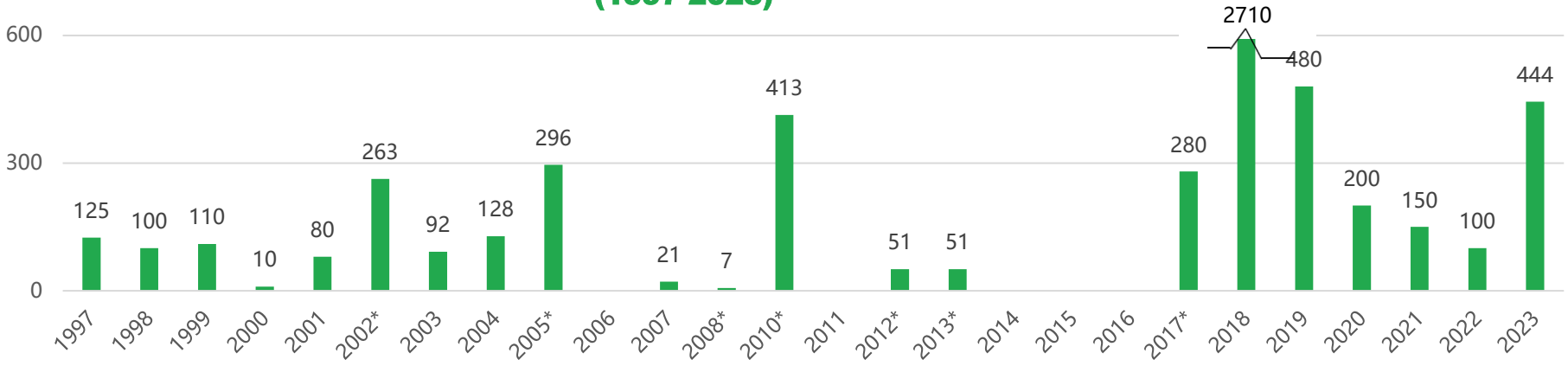
Exploring the Potential of other Non-Tax Sources and Land Value Capture to Enhance Local Resources

- Rental income, parking fees
- **Land value capture tools-** impact fees, Tradeable Development Rights

Source: Strengthening finances of Municipal governments, CWAS, 2020

Raising the importance of municipal bonds in wider public finance

Issuance of 33 Municipal bonds worth INR 6,031 crore in India (1997-2023)



Note: *Pooled bonds issues years marked

Most Municipal Bonds in India have been raised to finance **water supply and sewerage projects.** GoI can offer additional incentives to promote green projects. The new UIDF window at NHB can focus on Green Bonds

Incentives by GoI on raising municipal bonds

13% of bond amount

Bond amount	Incentive
100 cr	13 cr
200 cr	26 cr (Max)

Sources: www.sebi.gov.in, www.mohua.gov.in, 2018, AMRUT 2.0 operational guidelines, MoHUA, 2021 Source: Strengthening finances of Municipal governments, CWAS, 2020

Innovative approach of raising finance through green bonds and carbon credits - Case of Indore

Green Bonds

Green bonds over municipal bonds as it was easier to obtain carbon credits for a **"green" project**

Prerequisite checklist helped with ready made data availability

Carbon Credit Mechanism

Bundling of solar projects to obtain carbon credits

Verification and authorization through EKI

Selling of carbon credits worth INR 52 lakhs which is encashed for O&M of WASH solar project

- Currently, there is a **voluntary carbon credit market in India**..GoI plans to develop the Indian Carbon Market (ICM) where a national framework will be established to decarbonize Indian economy by pricing GHG.
- Bureau of Energy Efficiency, Ministry of Power, along with Ministry of Environment, Forest & Climate Change are developing the **Carbon Credit Trading Scheme** for this purpose.

Creditworthiness assessment of urban local bodies in India

Benefits of Creditworthiness Assessment

- Assess areas of improvement needed
- Lower costs compared to rating by CRA
- Build investor confidence

Parameters of Creditworthiness Assessment

- Quality of financial management
- Level of service delivery (water, SWM, sanitation)
- Assessing debt servicing capacity

Source: Based on forthcoming report by CWAS – Assessing Creditworthiness of Cities for market borrowing

A creditworthiness assessment framework for Indian cities which captures both financial and WASH service assessments

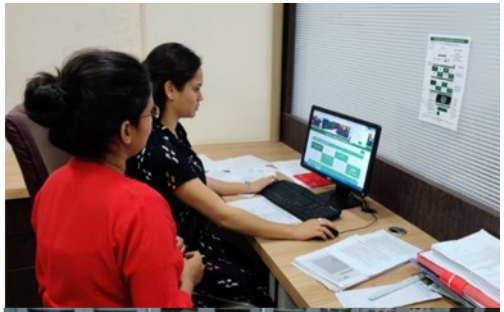
Using **creditworthiness self-assessment tool** before approaching a Rating Agency for a formal credit rating

Relies on **financial performance indicators** as well as the **WASH operational performance indicators**

Use of publicly available **datasets** makes it almost cost-free and can be done rapidly

Source: Based on forthcoming report by CWAS – Assessing Creditworthiness of Cities for market borrowing

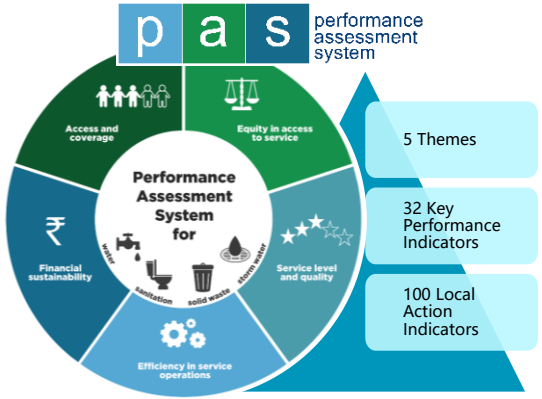
Regular and effective digital monitoring is critical for attracting impact investment – as it provides otcome information



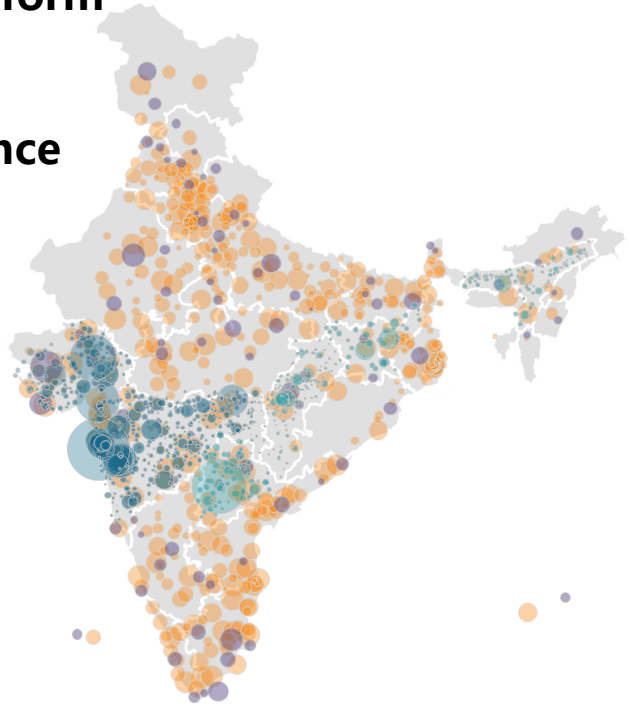
Sustained monitoring of universal access to safe water and sanitation in essential through country owned systems at city, state and national levels

Strong and regular monitoring systems are needed to ensure that any issues related to sustainability are identified early and addressed.

Monitoring city level water, sanitation and SWM services at scale Performance Assessment System (PAS) in India

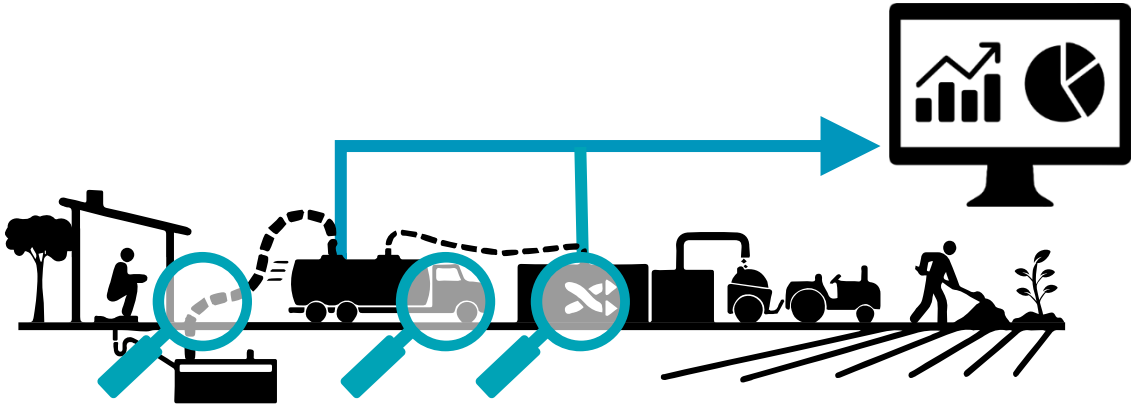


- ✓ **Nationally owned digital platform for self reporting by ULBs**
- ✓ **Sustained implementation since 2009 - at scale being used in 1000+ cities across India**
- ✓ Plans to add Climate resilience



Digital monitoring for effective service delivery

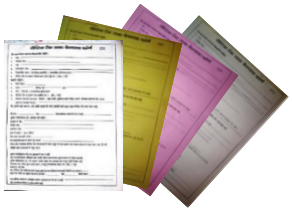
Use of monitoring systems across sanitation service chain – digital systems with dashboards



Possible uses of AI and ML

- Network and time efficiency - Optimise energy/water use
- Wide applications for image, video and voice processing - complaint redressal and breakdown assessment, monitoring use of PPE
- Large data processing – detecting accounting issues

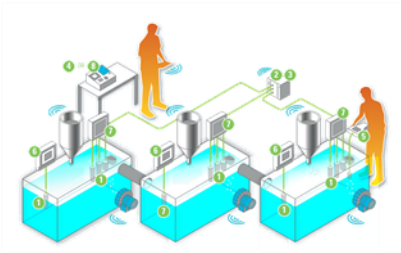
FROM Paper based – TO digital systems



SaniTab

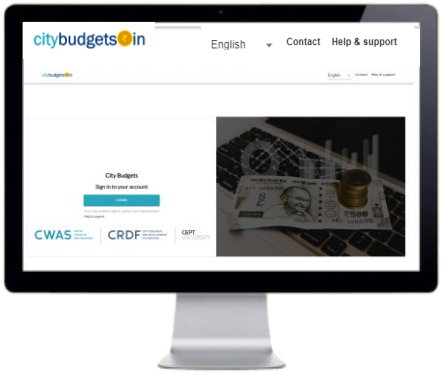
SaniTrack

SanQ

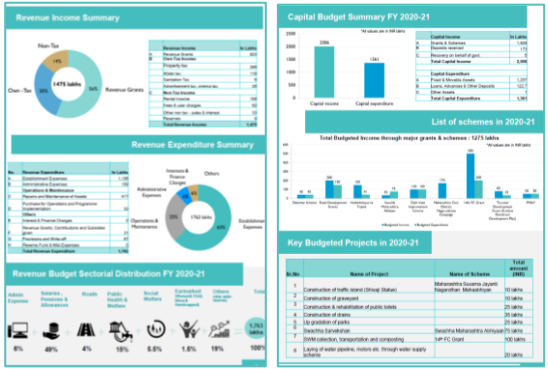


Strengthening municipal systems for procurement and budgeting

Budget Software



Budget Brief



Payment Dashboard

Enabling **uniformity and digitization of municipal budgeting** in Maharashtra

Easier to understand complex budget documents

Tracking and monitoring billing and payment of private contractors through **single window entry system**

Enhanced Transparency

Improved Accountability

Easily scalable across other cities

Source:

Capturing community feedback using digital tools

Civil society

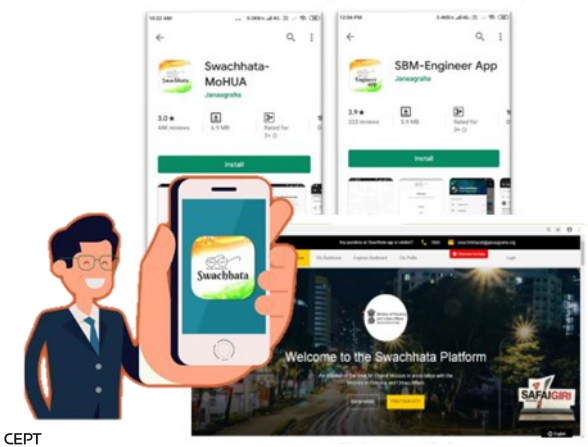
Youth Groups

Women Self Help Groups

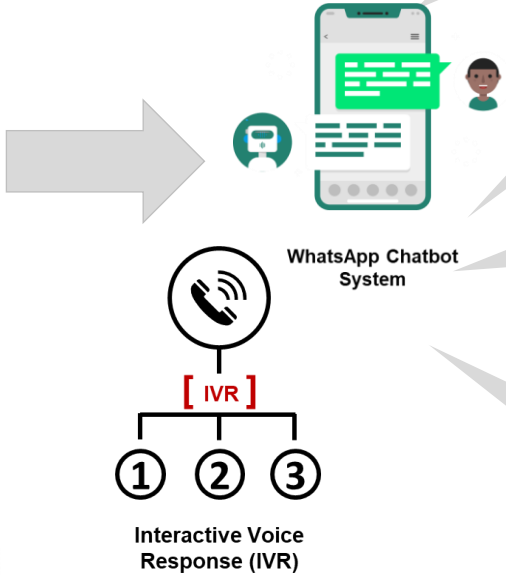
Bring in citizen voices especially for the vulnerable population in slums.

Platform to enable citizen reporting on service indicators like coverage and quality – a ***feedback platform***?

Feedback mechanism for local government: Performance improvement plan at local level to reduce disparities in service levels



MoHUA's Swachhata app for streamlining complaint redressal system



What improvements are needed to achieve universal coverage of water and sanitation?

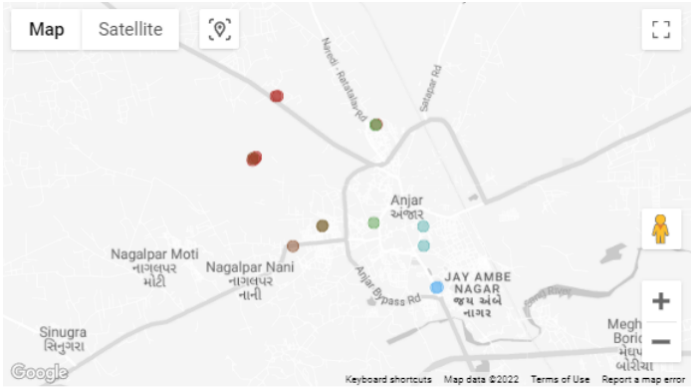
What type of financial resources / inputs are required?

What focus areas are needed under current programs?

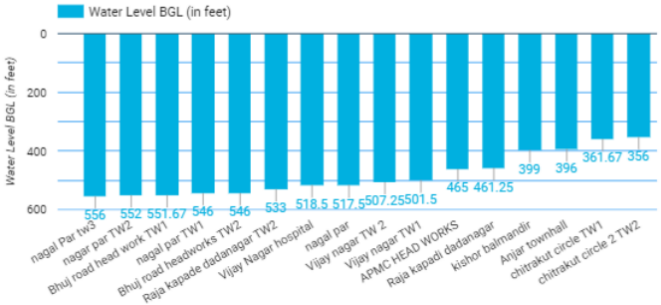
Spotlight improvement measures for the highest impacts

Crowdsourcing information on citizen perspective on service levels

Use of Mobile App to monitor ground water levels



Water Level 356 556



- Use of **Bhujal App** – for Ground Water Monitoring
- The app is **empaneled** under **AMRUT 2.0** by MoHUA **as a Technology and Implementation partner**
- **22 locations Pilot testing** -16 borewells @ Anjar and 6 borewells @ Gandhidham
- The **test results** were **similar** to the **data provided by the utility**

Benefits of such tools/applications

- ✓ Assess the **water demand**
- ✓ Measurements are **available in minutes**
- ✓ **Ease less** testing process
- ✓ **Community participation** in GW management
- ✓ Early identification of **drying borewells**

In summary:

To tap the emerging opportunities and challenges

Assess /address WASH linked **climate resilience** – for both mitigation/adaptation

Ensure **Inclusion** and **gender transformation** – Last mile connectivity and leveraging women SHGs

Adapt new and **innovative forms of financing and monitoring**

Resources

Urban Water Security Management Toolkit

Moving Bhuj Towards Water Security

Rethinking Urban Water Management - Lessons from Bhuj

Water secure and climate resilient cities Anjar and Gandhidham: Citywide Assessment

Citywide Inclusive Sanitation through Scheduled Desludging Services: Emerging Experience from India

Scheduled Desludging of Septic Tanks in Wai

Impacts of scheduled desludging on quality of water and wastewater in Wai city, India

Last mile connectivity for urban water supply services

Slum Free Ahmedabad

Climate responsive WASH initiatives in small and medium towns in India

Strengthening Finances of Municipal Governments

ESG assessments for cities in India

PAS - Public data systems for measuring WASH service levels in cities in India

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