WASH Programme and Urban Planning

Residential Training Programme for Junior Town Planners and Planning Assistants of ULBs and State Agency of Gujarat

With support from team at the Center for Water and Sanitation, CRDF, CEPT University

September 27, 2023

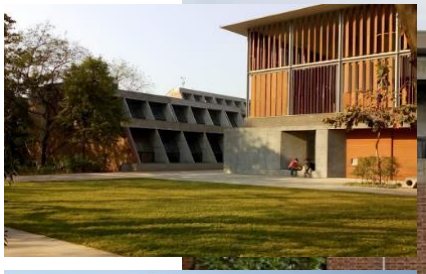
CWAS CENTER FOR WATER AND SANITATION | CRDF CEPT RESEARCH AND DEVELOPMENT FOUNDATION | CEPT UNIVERSITY

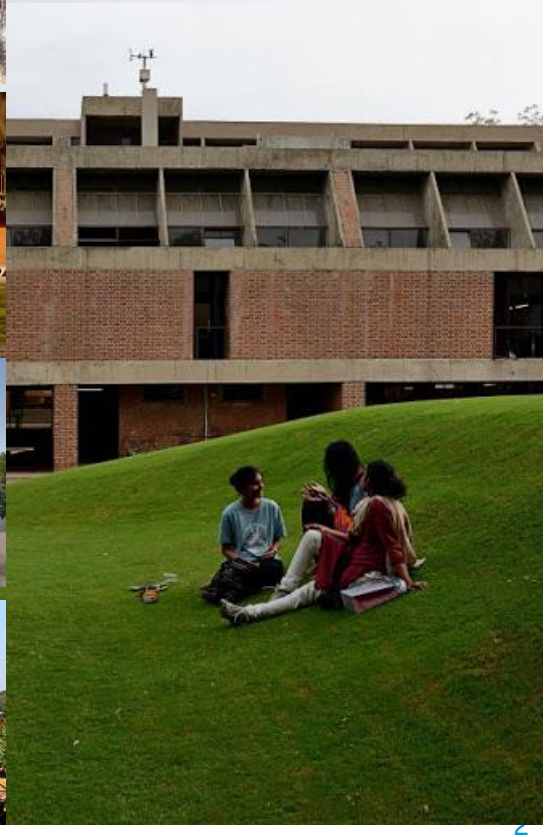
About CWAS, CRDF, CEPT…

CEPT University's core focus is human habitat. Through its education, research and advisory activities, it strives to improve the impact of habitat professions in enriching the lives of people in India's villages, towns and cities.

CEPT Research and Development Foundation (CRDF) has been established by the University to manage their research and capacity building activities. There are nine domain-focused centers in the CRDF. The Center for Water and Sanitation (CWAS) is among the first center to be established.

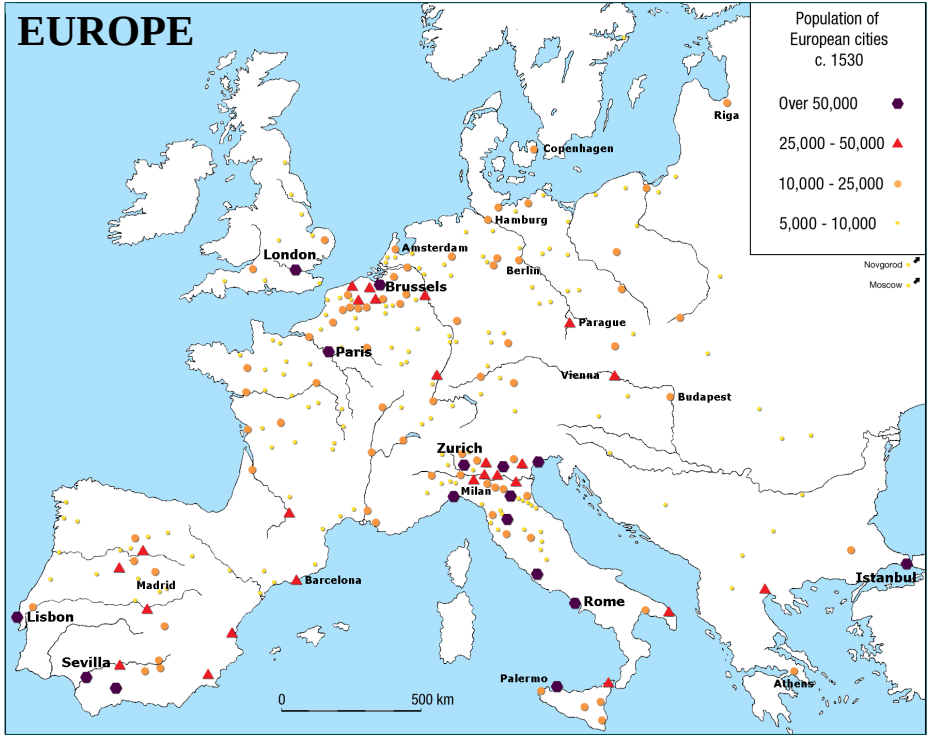
CWAS began its work in 2009 with focus on improving water and sanitation services in India. It carries out activities related to action research and capacity building – working closely with city and state governments, enabling them to improve delivery of services. CWAS is closely engaged with Faculty of Planning at CEPT University. CWAS team teach and guide students of Faculty of Planning.





Cities and water through history

Through history most cities emerged next to sources of water…



Sources: India: http://sitemaker.umich.edu/mladjov/files/indiageneral.jpg ; Europe: http://galleryhip.com/europe-cities-map.html

Urban Planning Wisdom – Where do we stand today?

Then

Mohenjo-daro | Lothal

Now

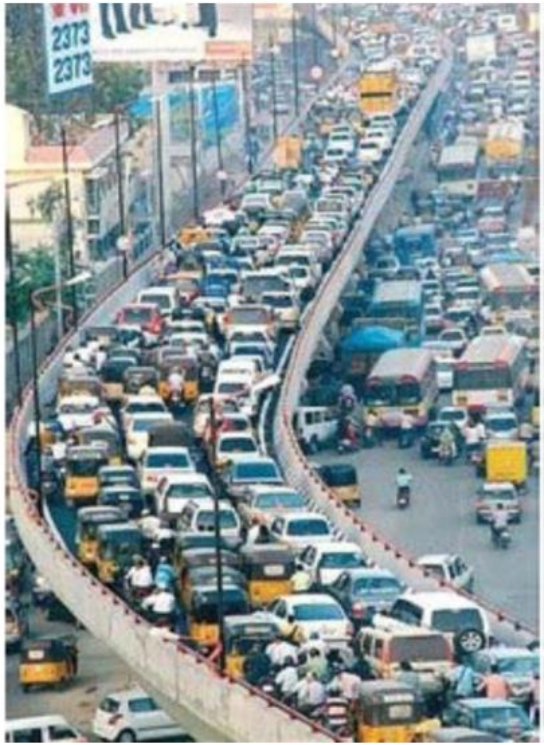
???

Urban Planning – Are we moving towards Equal Cities?

Photo Credit – Source: https://unequalscenes.com/mumbai

Conventional Urban Planning heavily focuses on land use management and 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



Key challenges faced by our cities, today …

Ironical situation- floods vs. water scarcity

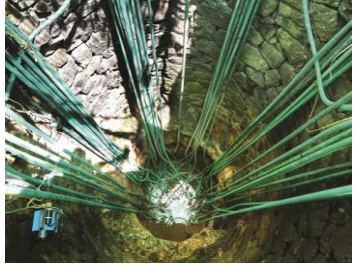
On the one end there is **acute water scarcity** and on the other, the **streets are often flooded** during the monsoons

Depletion of local water resources

Depletion of groundwater levels

Disappearing lakes | Industrial Contamination

Unsafe waste management


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 114 LPCD** citizen receives but more than **40% CITIES** supply is ...

POOR SANITATION in India is estimated to cause **[illegible] LOSS** according to a World Bank study.

98% CITIES ODF but by some estimates upto **[illegible]% OF WASTEWATER UNSAFELY DISPOSED**

What is the role of town planning community ???

... especially in context of climate vulnerability and resilience

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

National Flagship Programme on WASH focus on Green Growth...

SBM

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Grabage Free Cities and Open Defecation Free Cities/ Water+

More emphasis on **reuse**

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

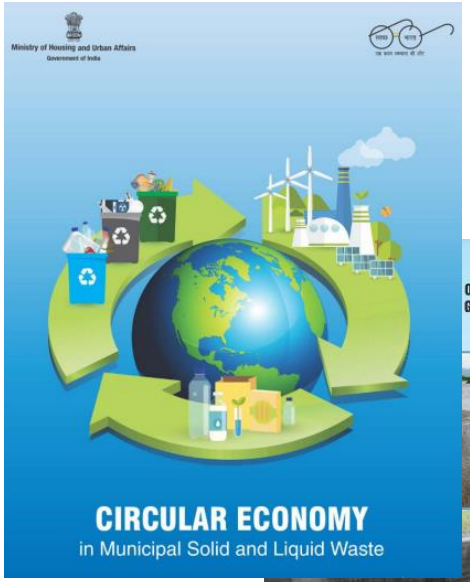
AMRUT

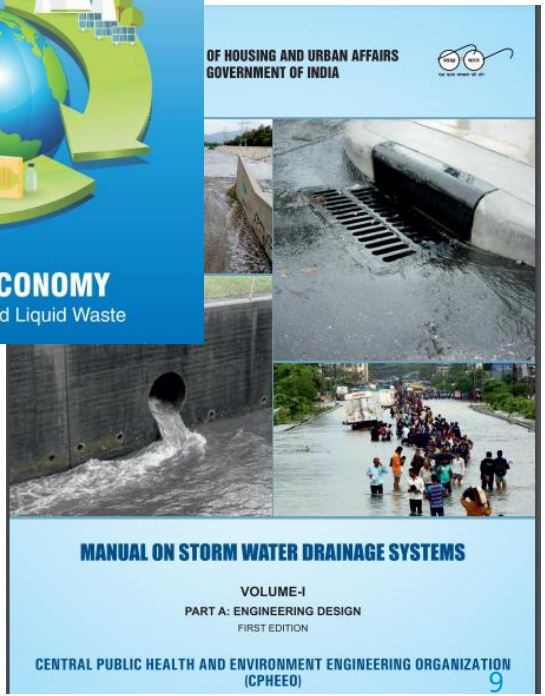
अमृत
Atal Mission for Rejuvenation and Urban Transformation

Focus on **Urban water security**

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

Development of **green spaces**





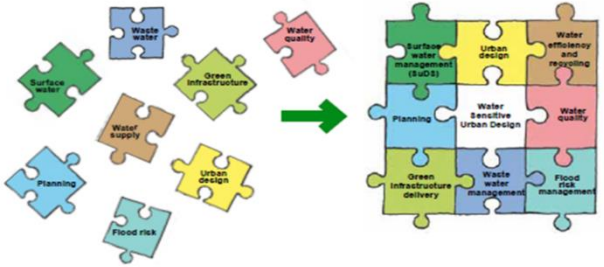
Source: SBM 2.0 guidelines, 2021, AMRUT 2.0 guidelines, 2021, UIDF Model Guidelines, Union Budget 2023-24

Emerging approaches for urban development (1/3)

Water Sensitive Urban Design

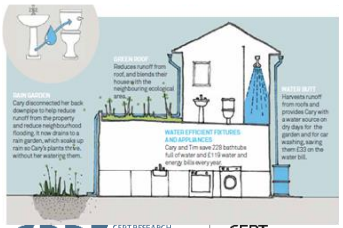
- Water Sensitive Urban Design is an approach to Urban Planning and design that aims to minimize hydrological and water quality impacts of urban development.

Water Sensitive Urban Design is the process.
Water sensitive places are the outcome.

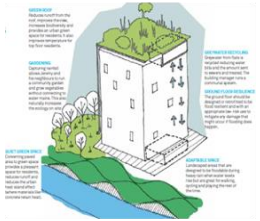


WSUD can be applied at all scales...

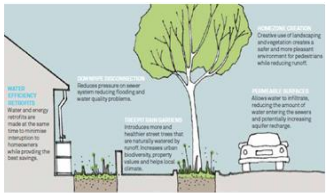
Property Level



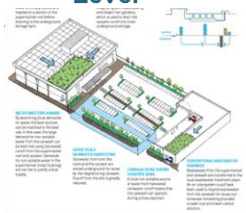
Flat Level



Roads



Neighborhood Level



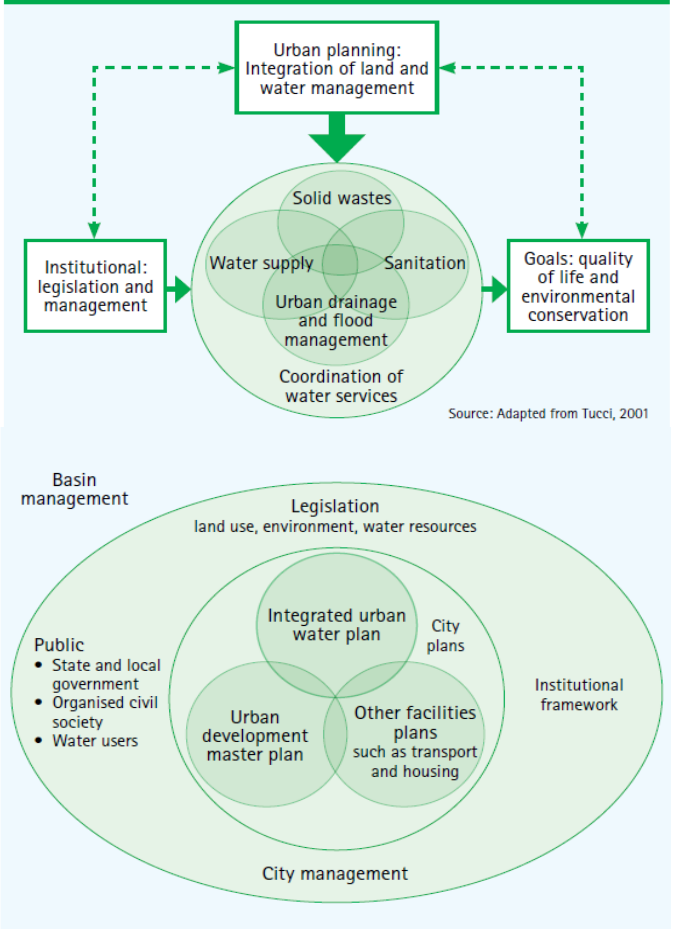
City Level

Source: WUSD in UK, Ciria (http://www.ciria.org/Resources/Free_publications/Water_Sensitive_Urban_Design.aspx)

Emerging approaches for urban development (2/3)

Integrated Urban Water Management (IUWM)

- Integrated Urban Water Management (IUWM) calls for the alignment of urban development and basin management to achieve sustainable economic, social, and environmental goals.
- Integrated Urban Water Management (IUWM) brings together water supply, sanitation, storm- and wastewater management and integrates these with land use planning and economic development.
- An IUWM approach integrates planning for the water sector with other urban sectors, such as land, housing, energy, and transport to avoid fragmentation and duplication in policy- and decision making.
- A successful approach requires engaging local communities to solve the problems of water management. Collaborative approaches should involve all stakeholders in setting priorities, taking action, and assuming responsibility.



Source: Policy Brief: IUWM Towards Diversification and Sustainability; GWP; August 2013

Emerging approaches for urban development (3/3)

Citywide Inclusive Sanitation (CWIS)

Access for all: universal access, informal settlements, women and girls, O&M...

Whole service chain: ensure treatment via a diversity of solutions (on- and off-site)

Thriving economy: sanitation is vital for economy and planning, political will is key

Working partnerships: complementary services, governance, participation

Source: https://unosd.un.org/sites/unosd.un.org/files/mr._andres_huseo_presentation_8october_2020_webinar_3.pdf

Integration of Blue-Green Infrastructure in Development Plan and Town Planning Schemes…

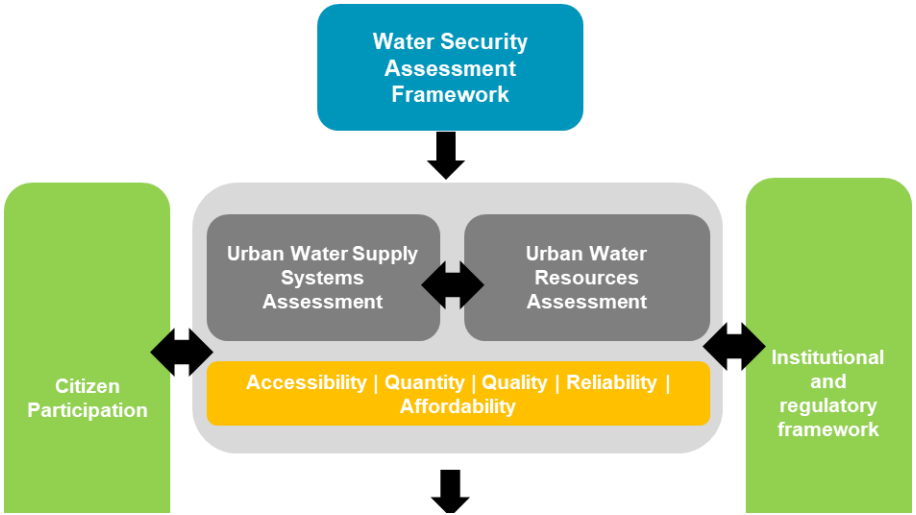
Role of Urban Planner

- Earmark adequate and suitable land under DP/ TPS is the key!
- Strengthening regulatory systems
- GDCR to amend to suits locally hydro-ecological context
- Financial incentives to promote new approach/ Blue-Green Infrastructure at scale

Source: https://www.wetlands.org/blog/blue-green-infrastructure-from-a-single-measure-to-city-wide-network/

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

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

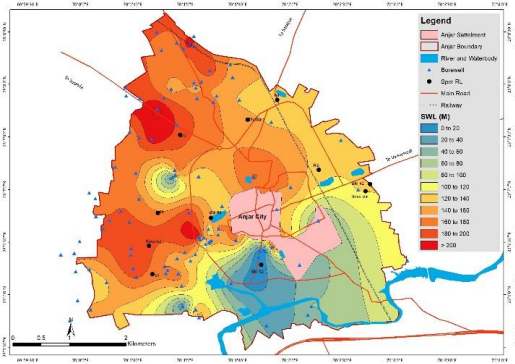
Geohydrological study for understanding aquifer and watershed of cities...

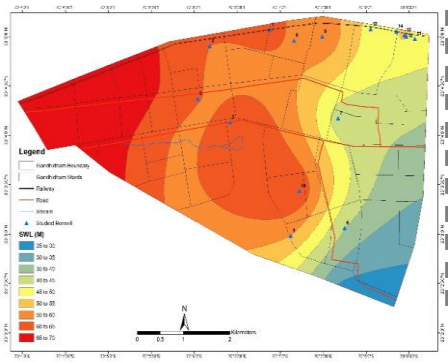
APPROACH FOR GEOHYDROLOGICAL STUDY

- WATER SOURCE STUDY
- PLANNING FOR PILOT DEMONSTRATIONS
- COMMUNITY ENGAGEMENT

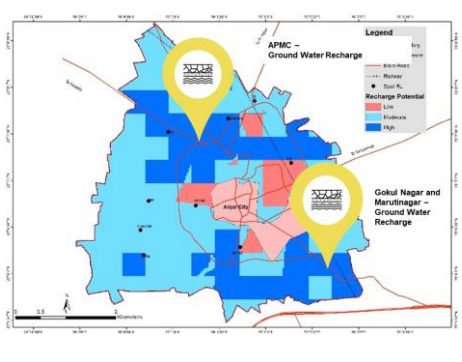


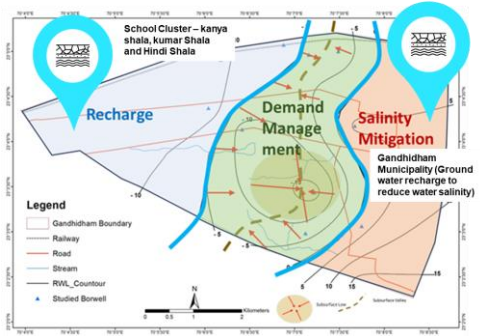

Ground water level and contour maps





Potential rainwater recharge sites



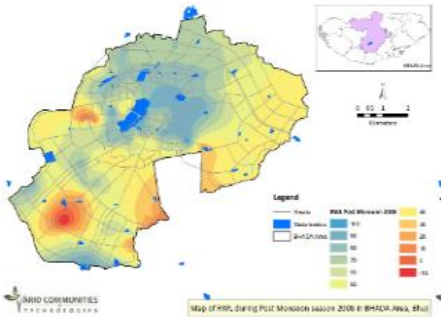


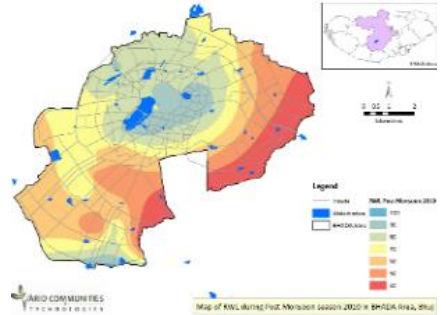
Technical studies and Community Mobilization are key…

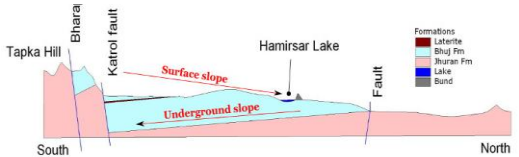
Understanding
- Local hydro-geology
- History of water management

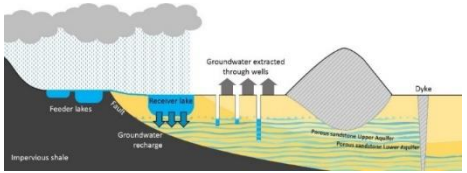
Groundwater monitoring

Current water supply system and key issues









Citizen forum - JSSS *Jalstrot Sneh Samvardhan Committee* (Water resource development committee)

Rallying and mass awareness

- Jalgatha - "Water story walks" explaining local hydrogeology
- At local cultural/religions festivals
- Lake clean up drives
- Children's' activities

'Parab' – Trained Para-hydrogeologists as Local Champions

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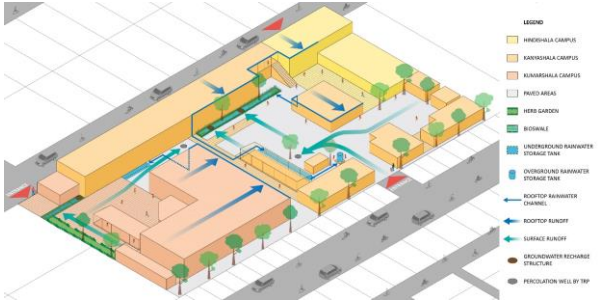
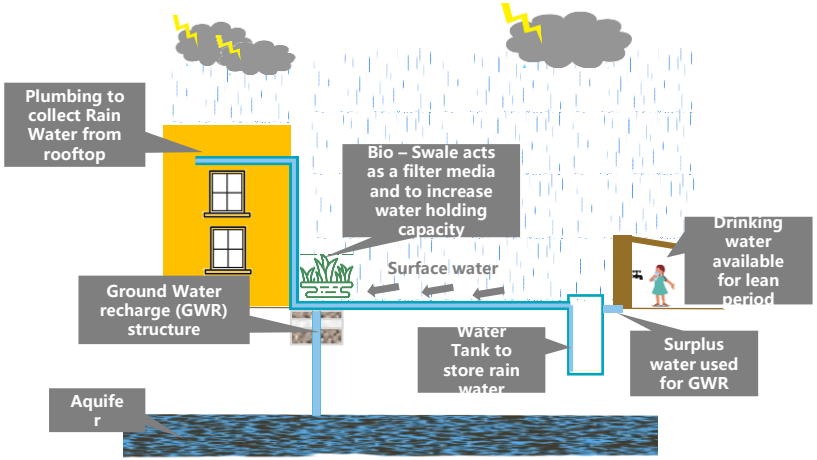
Pilot Demonstrations – Rain Water Harvesting and Ground Water Recharge in Gandhidham …



3 cluster of schools



Plumbing Work



Bio-swale/ borewell

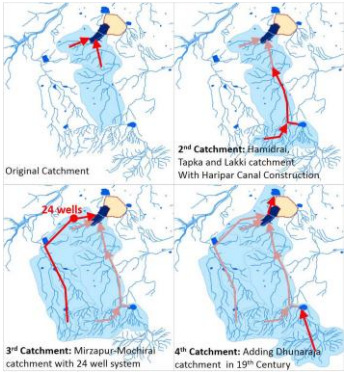




VJT – Mineralized tanks


Exploring alternative water supply systems through pilot project demonstrations and citizen participation

Revival of local, traditional sources



Repairing traditional lake catchment system developed by old rulers

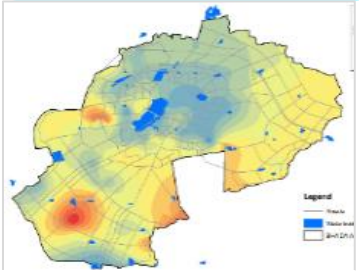
De-silting lakes with public participation

Revival of old unused well for decentralized piped supply for a slum

Rainwater Harvesting

Student managed rain water harvesting in school for drinking water supply

Groundwater recharge



Ensuring viability of groundwater borewells through water level monitoring and recharge activities

Flood control through GW recharge for a housing colony

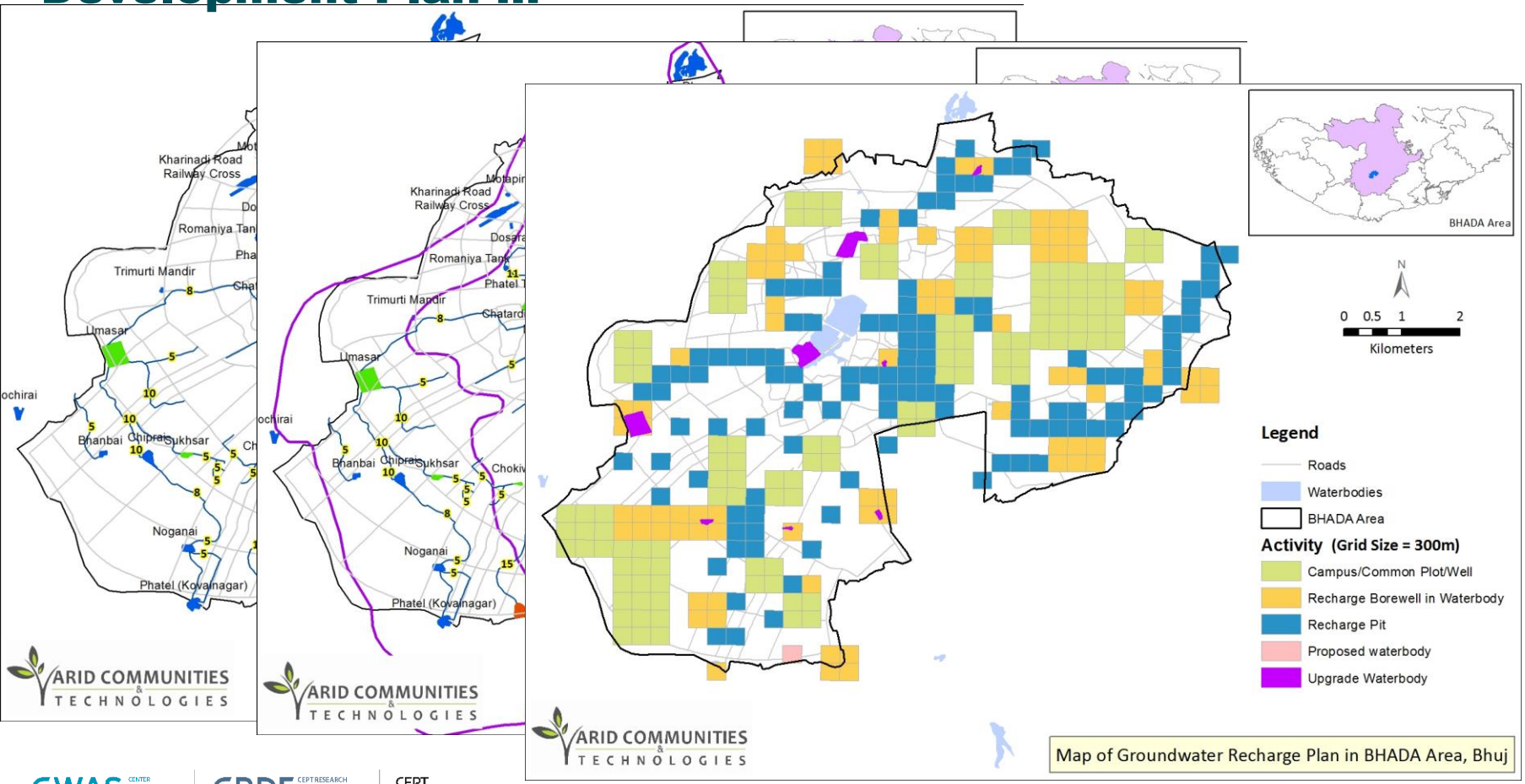
Wastewater Reuse

Greening by DEWATS

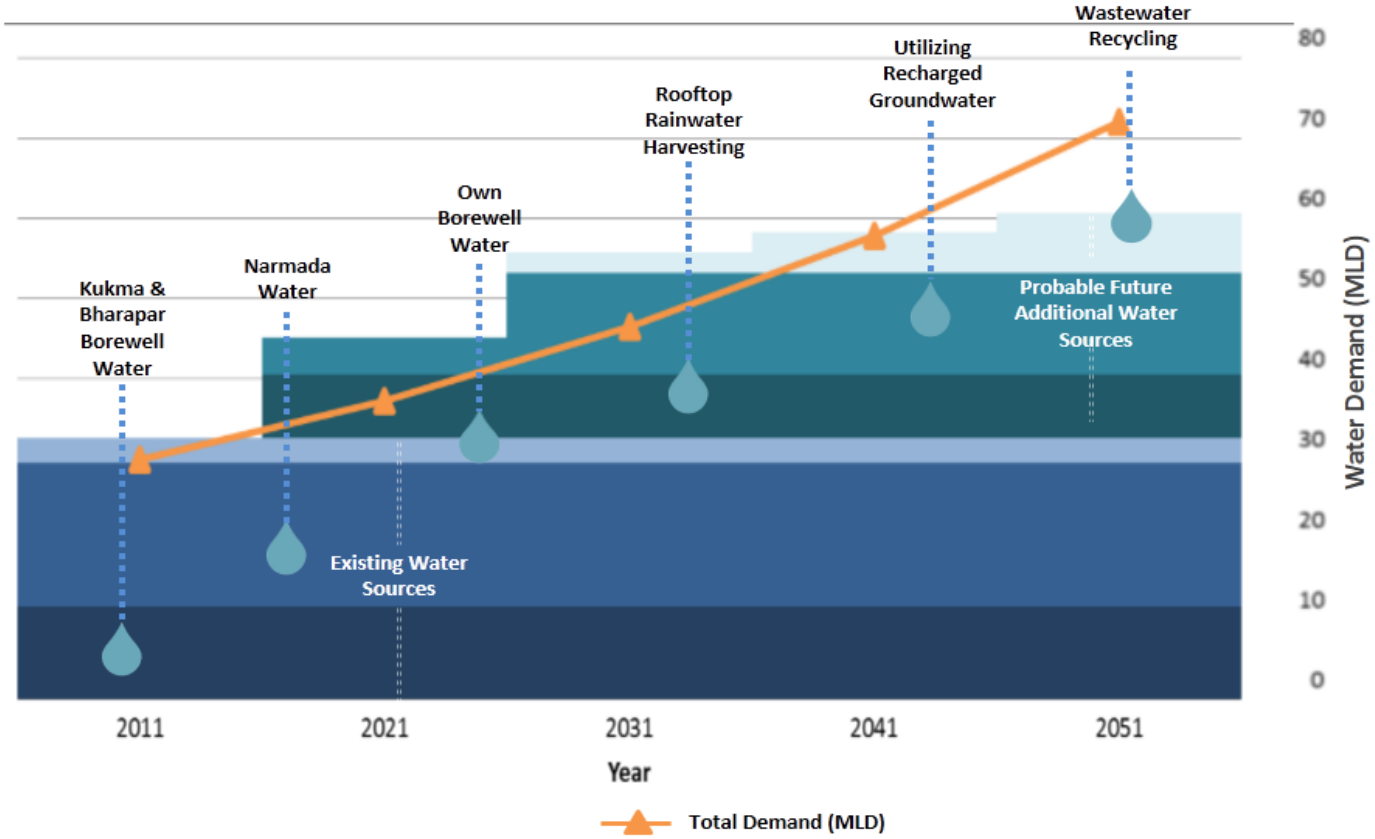
Through...

- Citizen Involvement
- Pilot project demonstrations

Proposed Convergence of Water Security plan with Area Development Plan ...

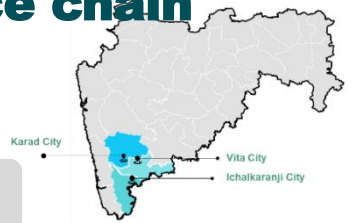


Envisioning a water secure city – A case of Bhuj...



Making WASH services Carbon Neutral - across the service chain

Experiences from Maharashtra Cities



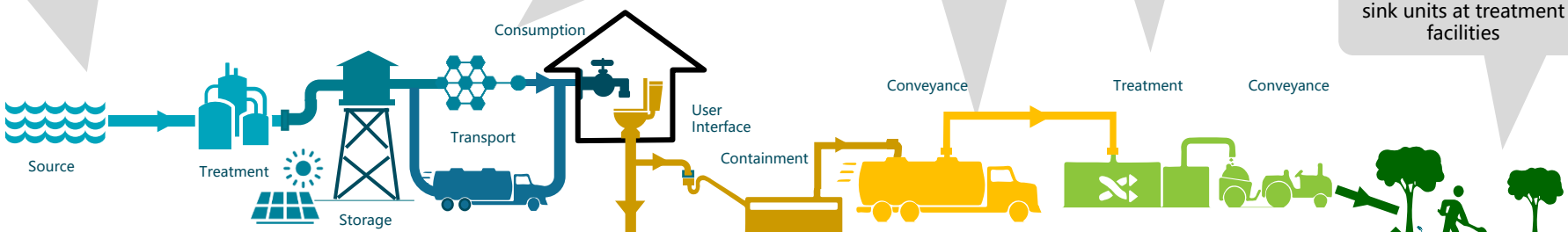
Assessment of water and sanitation services and emissions in operations – energy and water audit

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

Urban forests as carbon sink 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

Sinnar FSTP and Urban Forest. . . Like oasis in a desert

In Sinnar, **8000 square metres of urban forest and landscaped area** is growing in the midst of an otherwise barren and rocky land and m**anaged by women SHG groups.** The forest uses **treated water and dried sludge from the FSTP. More than 1400 trees were planted** in he urban forest attracting various species of birds and **is helping to sustain healthy biodiversity.**

Some recent news on actions...

AMC adopts 'Sponge City' plan to tackle urban flooding

Will Spend ₹250cr On Ecobloc Stormwater System, Develop Scheme For Flood Warning

Jignesh.Parmar
@timesgroup.com

Ahmedabad: In response to frequent waterlogging during monsoons, the civic body in Ahmedabad is adopting the concept of a 'sponge city' to mitigate urban flooding. A fund of Rs 250 crore from the National Disaster Management Authority (NDMA) has been allocated for implementing an urban flood management plan in the city. This plan includes several components such as lake interlinking, the installation of ecobloc stormwater management and infiltration tank systems in key waterlogging areas, and the development of a real-time flood warning system.

As a pilot project, the Ahmedabad Municipal Corporation (AMC) has selected the Bandhan Trikona area in Sola for the installation of ecoblocs along the road. Ecoblocs are modular polypropylene blocks that can be stacked together to create water reservoirs capable of storing, infiltrating, or reusing rainwater. A senior AMC official said, "Ecoblocs offer several advantages over conventional gravel infiltration ditches, including a significantly higher reservoir volume for rainwater (up to 97% compared to 30-40% for gravel)." The initial cost of implementing the ecobloc system in Sola is estimated to be Rs 80 crore, he added.

Ahmedabad currently has 115 waterlogging hotspots where water accumulates for up to four to five hours during heavy rains. "The majority of these hotspots are located in the South Zone, which includes areas like Maninagar, Behrampura, and Isanpur," adds AMC official.

The ecobloc sponge parks can direct stormwater to nearby gardens or water reservoirs. "The second project that will be undertaken is interlinking of lakes, in the newly developed South West Zone. These include interlinking of seven major lakes like the Punia, Bedar, Mumatpura, Malkani Sarkhej, Sakri, Fatehwadi, Azadnagar and Kanajiyu lakes. A similar plan is being chalked out for seven lakes in the East Zone too," added the AMC official.

The AMC will also implement a real-time flood warning system and the real-time data will be broadcasted to citizens. The NDMA will release Rs 50 crore annually to support Ahmedabad's urban flood mitigation efforts. The proposed plan and the selection of a consultant responsible for its implementation have been presented to the standing committee for approval.

SPOTS THAT REMAIN WATERLOGGED FOR 4-5 HOURS

North West 115 | West 25 | North 14

Pics: Yogesh Chawda & Ancela Jamindar

AREAS WHERE WA

JODHPUR: PQC Road (St Gala Gymkhana Road, Bh Bopal Gam, Premnirth D service roads near Shivra and Shyamal crossroads

WHAT IS

It consists of modular blocks that can be stacked together to form a reservoir to store, infiltrate or reuse rainwater. The ecobloc s has many advantages o conventional gravel infiltration ditches

ECOBLOCS ADVANTAGES

GREATER STORAGE: The ecobloc system can pro reservoir volume in exc compared to 30%-40% standard gravel infiltrat

LONG SERVICE LIFE: Th made of durable plastic can withstand high load corrosion. Its service lif to exceed 50 years

CENTRE'S SUGGESTIONS

- Information on total water bodies and status of encroachment
- Water bodies be included in land records so that action be taken against encroachers
- Report checks on human activities on the catchment areas
- Water bodies to be included as integral part of town planning process
- State govt should ensure concurrent evaluation of the water bodies under repair, renovation, and restoration of water bodies scheme
- State should involve the user communities for keeping the water bodies encroachment free
- State should explore possibility of creation of new water bodies


Sarkhej Roza lake

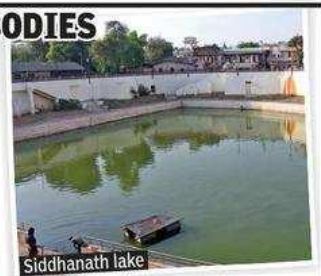
WATER BODIES UNDER VARIOUS JURISDICTIONS

Cities and towns	Water resources dept	Revenue dept
1,939	4,413	12,182
Panchayat dept	**Total**	
25,604	44,138	

URBAN COUNT

Area	Lakes
Vadodara	625
Surat	330
Gandhinagar	61
Ahmedabad	60
Junagadh	18
Bhavnagar	12
Rajkot	9

OUR WATER BODIES


Siddhanath lake

Name of lakes		Name of lakes	
Sursagar	6.74	Masiya	0.42
pura	2.24	Danteshwar	4.68
Gotri	1.68	Ajwa Road	3.41
ursali	3.54	Kamlanagar	3.86
orwa	3.53	Atladara	4.65
nath	0.48	Lal Baug	1.23
darni	7.79	Manjalpur	1.07
nath	5.39	Mohammed	0.77
ama	5.61		
asna	3.58		
dalja	7.64		
rasia	1.29		
hobi	2.41		
abdi	3.79		
Rani	3.46		

Total area **79.26**

Area covered by them in hectares


ar lake

Areas where recharge wells can be constructed in existing ponds/ lakes

Alkapuri, Gotri, Sevasi, Old Padra Road, Akota, Atladara, Manjalpur, Makarpura, Pratapnagar, Subhanpura, Gorwa, Refinery Road, Fategunj, Nizampura, Sama-Savli Road, Chhani Road

Institutionalize the new thinking in urban planning applications …

Old	New Thinking
Human waste is a nuisance	Human waste is a resource
Storm water is a nuisance	Storm water is a resource
Build to meet the demand	Manage demand
Demand is a matter of quantity	Demand is multifaceted
One use (throughput)	Reuse and reclamation
Grey infrastructure	Green infrastructure
Bigger/centralised is better	Small/decentralised is possible, desirable
Use standard solutions	Allow diverse solutions
Integration by accident	Design physical & institutional integration
Collaboration = public relations.	Collaboration = engagement.

Source: Pinkham, R. (1999). *21st Century Water Systems: Scenarios, Visions, and Drivers,.* Mountain Inst., Snowmass, Colorado

New urban development discourse for urban planners should be…

Town planners in India have made **urban development plans**, and helped in the implementation of **large programs such as JNUURM, AMRUT, SBM and SMART Cities**

Move from Infrastructure → **to service delivery, gender responsive, equitable, climate responsive and resilient services**

Infrastructure provision → **Ensuring quality services and equity** → **Financing and Climate response** → **Digital monitoring**

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Thank you

About us

The Center for Water and Sanitation (CWAS) is a part of CEPT Research and Development Foundation (CRDF) at CEPT University. CWAS undertakes action-research, implementation support, capacity building and advocacy in the field of urban water and sanitation. Acting as a thought catalyst and facilitator, CWAS works closely with all levels of governments - national, state and local to support them in delivering water and sanitation services in an efficient, effective and equitable manner.

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