Asia Water Forum 2022
8–11 August 2022 • Online

Focus Area: Water as a sustainable resource

Session Title: Moving cities towards Urban Water Security

Schedule: [10 August 2022 (Wed) | 9:00 a.m. - 10:30 a.m. (GMT+08)]

CWAS CENTER FOR WATER AND SANITATION
CRDF CEPT UNIVERSITY
ADB

Water security is emerging as an issue of extreme urgency

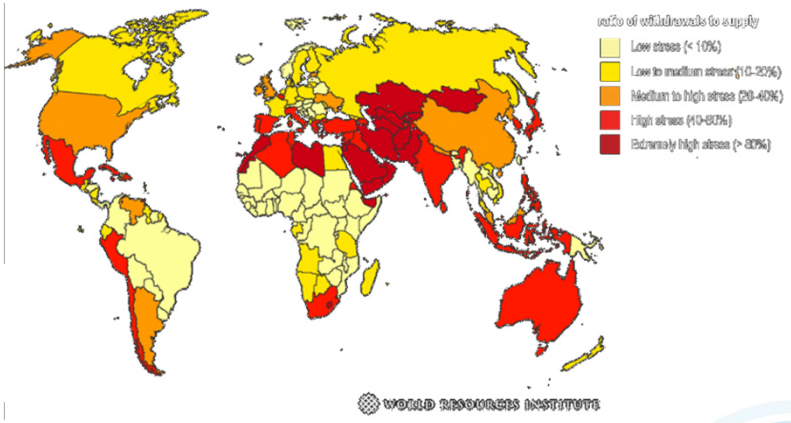
- The first Water & Climate Pavilion at COP26 stressed on water resilience to build climate and socio-economic resilience

- A recent UNCCD report says 75% of world population will be affected by droughts by 2050

- 17 Countries, Home to One-Quarter of the World's Population, Face Extremely High Water Stress

- 12% of India’s population is already living the ‘Day Zero’ scenario, looming 21 cities of India

Water Pavilion
Water for Climate



Source: IUCN.ORG; UNCCD; WRI, 2019

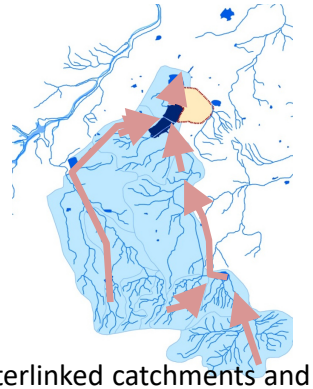
Bhuj a city located in Gujarat, India has survived an arid climate for centuries

- Importance of aquifer and interlinked catchments
- Linked adjoining watersheds with a series of dams and canals to feed the artificial lake
- Community managed wells
- The entire catchment system well-managed and activities such as de-silting, cleaning of lakes and cleaning of channels in catchment areas done regularly

Traditional Water Systems in Bhuj

Water conservation and ground water recharge

Canal linking the catchments

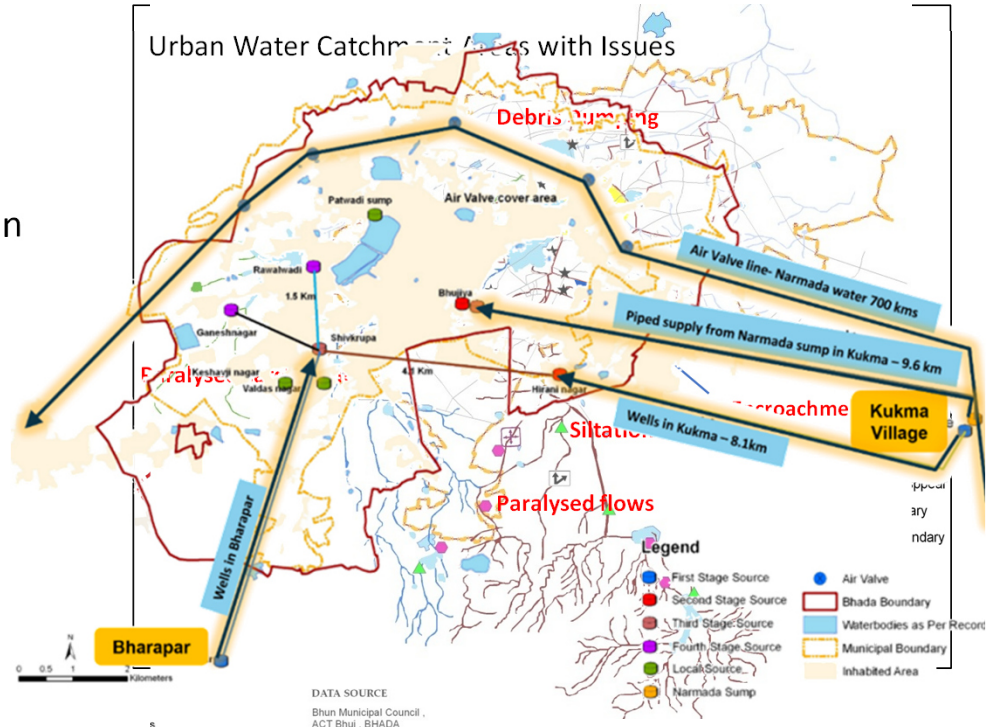


Interlinked catchments and lakes

Community managed lakes and well systems

Bhuj: Facing same issue as any modern city in recent times

- Ranging far and wide for water
- Collapse of interlinked catchment system; less water flowing in lakes which dried up many lakes
- Encroachment and construction on lakes
- Disappearance of lakes exacerbated flooding issues
- Less water for recharging the aquifer
- Groundwater level fell and there was declining quality of water



From **66** lakes to 2

7 vanished	**17 he silt**

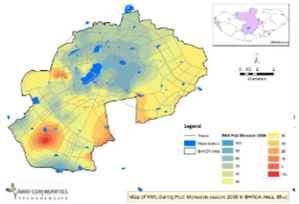
Water Stagnations
Waste Water Inflow
Siltation
Sandstone Quarry
Damaged Diversion
Roads
Water Bodies
Relocation Sites
Paralysed Flow
Encroachment
Dense Prosopis Juliflora
Debris Dumping
Municipal Boundary
Ward Boundary

Bhuj moving towards water security with its recent initiatives

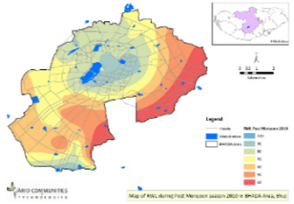
Arid Communities and Technologies (ACT), a local NGO took initiatives towards water security in Bhuj

Technical studies as backbone for work

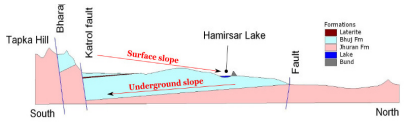
Understanding Local hydro-geology and history



Groundwater monitoring



Current water supply system and key issues



Community Mobilization

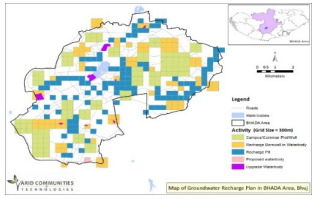
Citizen forum - JSSS

Rallying and mass awareness

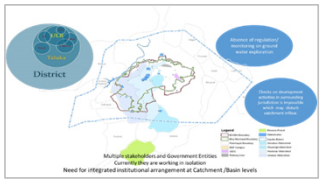
'Parab' – Trained Para-hydrogeologists as Local Champions

Advocacy to Local government and Convergence with existing national programs

Inclusion of hydrogeology in land-use planning



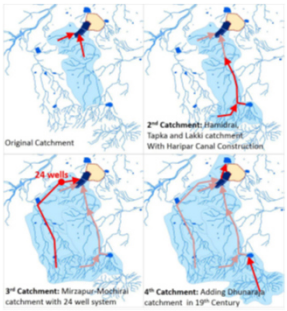
Strengthening institutional framework



Sensitization workshops for officials

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

Revival of local, traditional sources



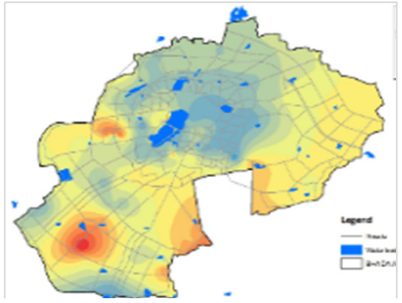
Repairing traditional lake catchment system developed by old rulers

De-silting lakes with public participation

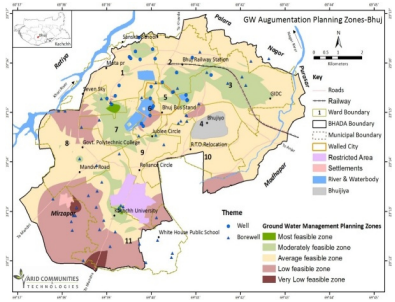
Rainwater Harvesting

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



Creating groundwater recharge structures

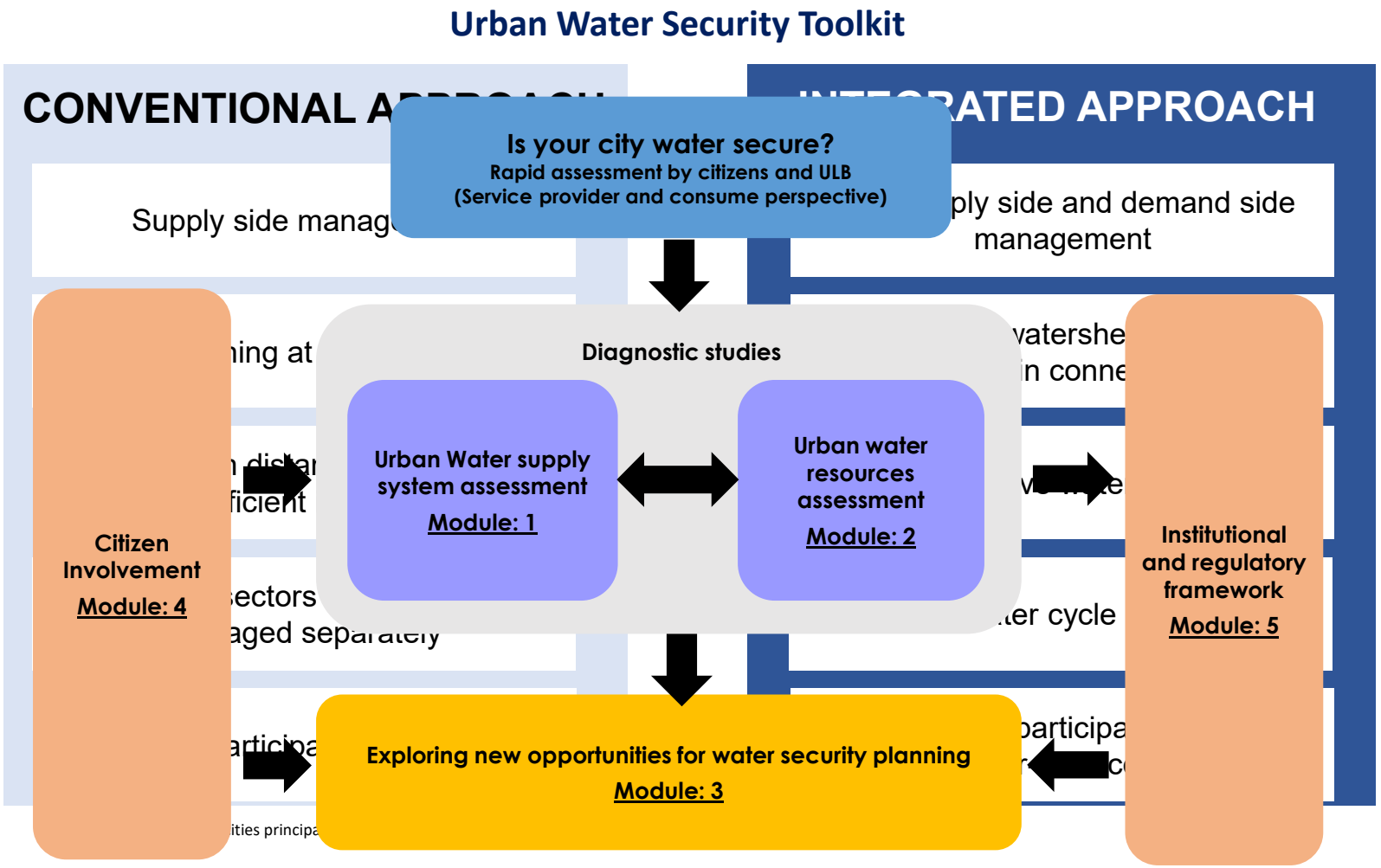
Revival of old unused well for decentralized piped supply for a slum

Wastewater Reuse

Greening by DEWATS

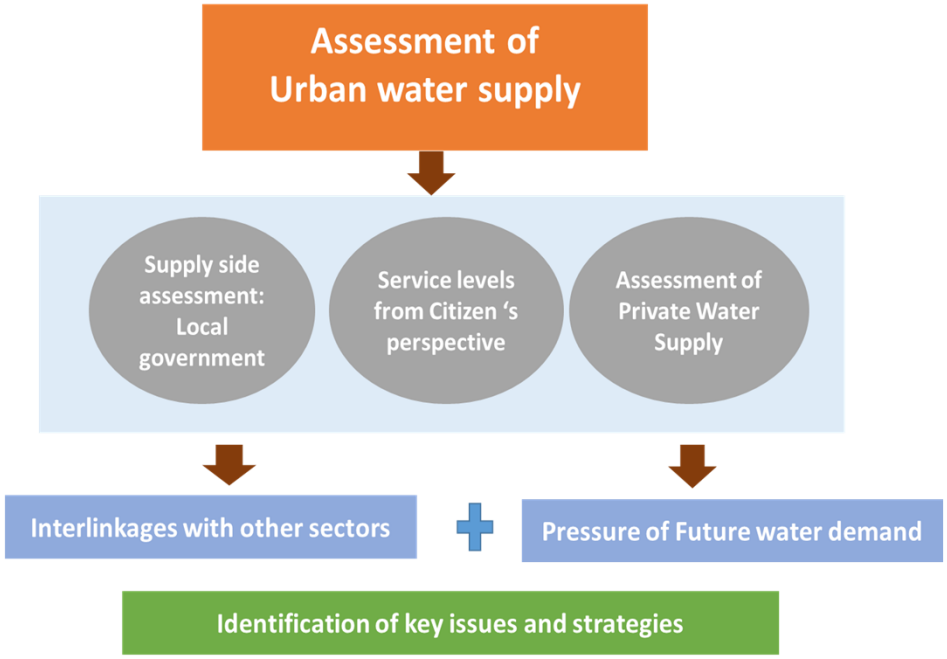
Flood control through GW recharge for a housing colony

Need to move from conventional approach to integrated approach



M1: Urban water supply system assessment

- Holistic approach by analyzing of service provider, users' perspective and private water supplier
- Interlinkages with other sector of sanitation, storm water and solid waste management
- Pressure of future water demand on current water sources
- Spatial analysis and identification of intervention areas



Prime Tools for assessment

Checklist for data collection	**Non- Revenue Water assessment and water audit**	**Analysis of private service providers**	**Water quality testing regime**	**Private sources assessments**	**Water demand projection**

M2: Understanding urban water resources

- Assessment of hydrogeological characteristics and water resources
- Looking at water from a resource perspective rather than a supply perspective
- Water balance assessment

Water resources inventory

- Rainfall and its potential
- Watershed and surface water assessment
- Aquifer and GW assessment
- Documenting and understanding history of water management

Prime Tools for assessment

- **Water resources inventory**
- **Resources for Aquifer assessments**
- **Protocols for Groundwater and surface water monitoring**
- **Guide on how to mark water shed**
- **Detailed steps for assessing rainfall and its potential**
- **Template for Water balance**

M3: Exploring new Opportunities for water security Planning

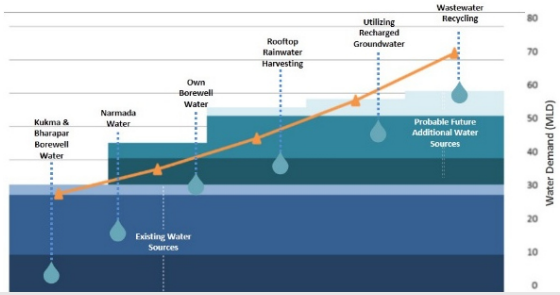
- Based on assessment in module 1 and 2, identifying new opportunities.
- Exploring the alternate sources of water for a city such as rainwater harvesting, groundwater recharge, local water sources revival and reuse of wastewater.
- Focusing on improving efficiency of existing water supply systems
- Developing comprehensive urban water scenarios

Alternative Urban Water Sources

Rainwater Harvesting	Revival of Local Water Sources	Groundwater recharge	DEWATS / Wastewater Reuse

Increasing Efficiency of Existing water systems

Reducing Non revenue water (NRW)	Pricing as a tool for water demand management	Improving quality of water supply	Metering of water supply



Prime Tools for assessment

Resources for rooftop RWH

Lake conservation practices and guidelines

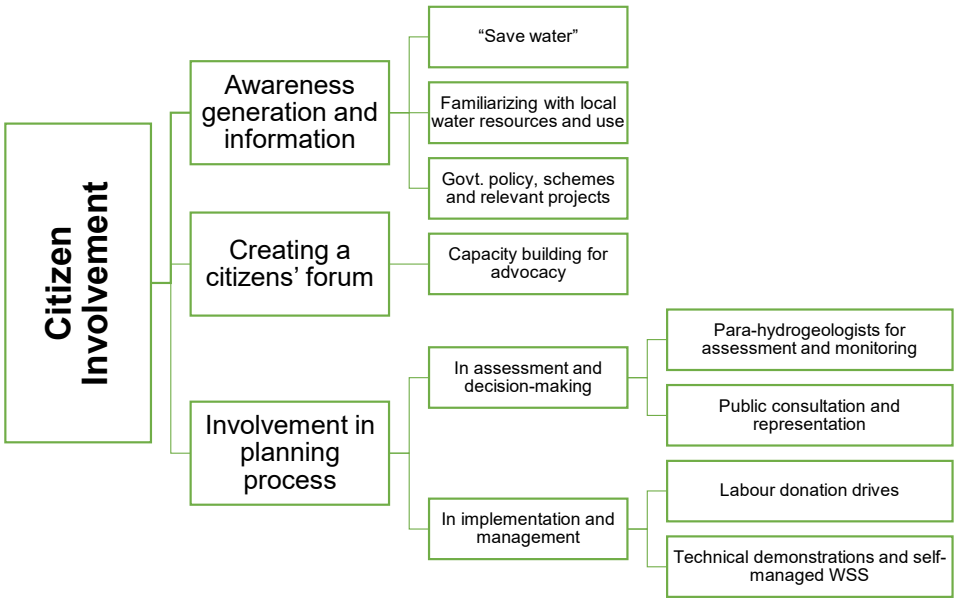
Assessing NRW template

Guides for Artificial recharge

Wastewater reuse guidelines

Water tariff model

Involving citizen and institutional and regulatory framework



Assessment of existing institutional and regulatory framework

- Assessing existing Acts at all government tiers
- Mapping organizational linkages

Identifying gaps and overlaps in the existing framework

- Gap assessment: policy and organization level
- Identifying missing opportunities in organizational structure and policies

Strengthening the framework: coordination and facilitation

- Institutional integration
- Monitoring framework
- Data sharing – a platform
- Inclusion of hydrogeology in mainstream planning

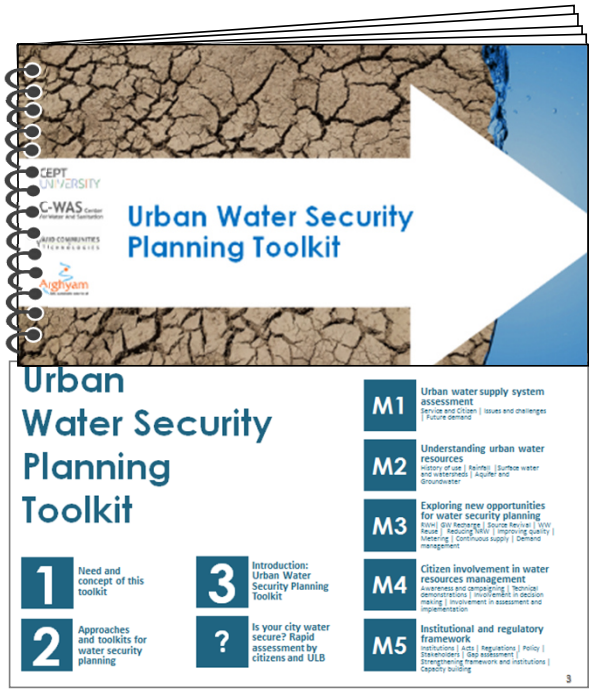
Capacity building and learning alliance

Prime Tools for assessment

- **Training modules for community based water management**
- **Course outline for para-hydrogeologist training**
- **Guides and resources for IEC**
- **Training modules for water committees**
- **Checklist for gap assessment**

Key features of the toolkit

- The approach of toolkit is to prevent crisis and move the cities towards a secure future by becoming ‘self-reliant’ for water
- Begin with the conservation of local water resource rather than depending on distant sources
- This toolkit has been developed to pave the way for other cities to become water secure
- It can be adapted and tailored according to the context and needs of each city



Urban water security planning toolkit available at: https://www.pas.org.in/Portal/document/Urban Water Security Planning Toolkit.pdf

Thank you

https://cwas.org.in

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CWAS, CEPT University was the Knowledge Management and Advocacy Partner to Arid Communities and Technologies (ACT) for Participatory Ground Water Management activities in the city of Bhuj, Gujarat, India. This project was funded by Arghyam, Bangalore. Based on this study, CWAS has developed Urban Water Security Planning Toolkit.

About us

The Center for Water and Sanitation (CWAS), CRDF at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services.

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