



21st African Water Association International Congress & Exhibition
and
The 7th International Faecal Sludge Management Conference

Rethinking Urban Water Management: Improving Water Security Through
Participatory Groundwater Management

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Center for Water and Sanitation (CWAS), CEPT University

Abidjan, Côte d'Ivoire
19-23 February 2023

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FOR WATER AND
SANITATION

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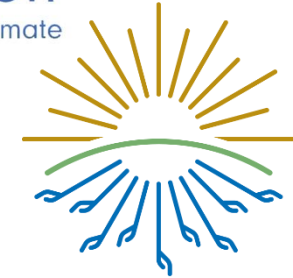
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Water security is emerging as an issue of extreme urgency

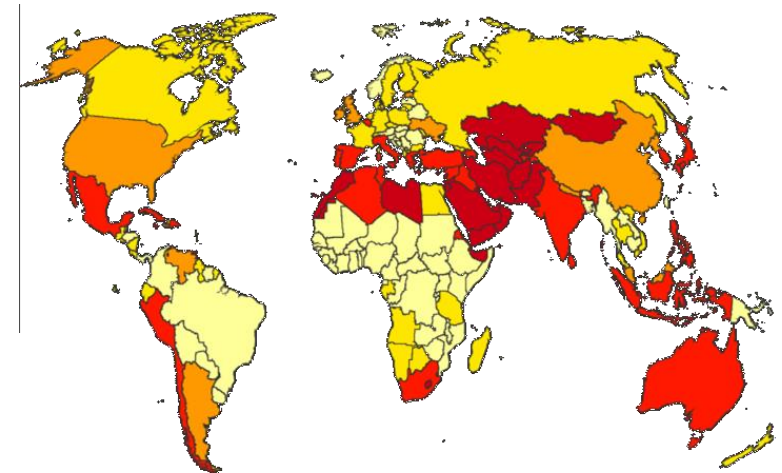
- The Water & Climate Pavilion at COP27 stressed on water resilience to build climate and socio-economic resilience
- A recent UNCCD report says 75% of world population will be affected by droughts by 2050
- 17 Countries, Home to One-Quarter of the World's Population, Face Extremely High Water Stress
- 12% of India's population is already living the 'Day Zero' scenario, looming 21 cities of India



Water Pavilion
Water for Climate



COP27
SHARM EL-SHEIKH
EGYPT 2022



Source: [IUCN.ORG](https://www.iucn.org); [UNCCD](https://www.unccd.org); [WRI, 2019](https://www.wri.org)

WORLD RESOURCES INSTITUTE

Parts of Delhi may face water crisis today as ammonia levels rise in Yamuna

The spike in ammonia levels in the Yamuna has largely hit water production at four main water treatment plants - Sonia Vihar, Wazirabad, Chandrawal and Okhla.

INDIA NEWS

Several areas in Chennai flooded after record rain, intensity to reduce today

Chennai has recorded 1000mm of rain in a month for the fourth time for any month and the third time in November in 200 years, data showed.

India seeks to arrest its alarming decline in groundwater

JOHN ROOME | MAY 25, 2022
This page in: English | Hindi

Sunday, Nov 28, 2021

Outlook

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Shimla's Water Woes: India's Favourite Hill Station Continues To Be At Risk

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The root cause of Chennai's distress during rains lies in mismanagement of its water bodies

Unexpected floods point to the need for better urban planning to face extreme weather events

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Home > All India > 'Water Train' To Maharashtra's Drought-Hit Latur Completes 100 Trips

This Article is From Jul 30, 2016

'Water Train' To Maharashtra's Drought-Hit Latur Completes 100 Trips

All India | Indo-Asian News Service | Updated: July 30, 2016 11:13 pm IST

CLIMATE CHANGE

Study identifies India among global flash drought hotspots from 1980-2015

The study identified rapid drought intensification across the United States, Brazil, southern Africa, Spain, western Russia and Australia as well

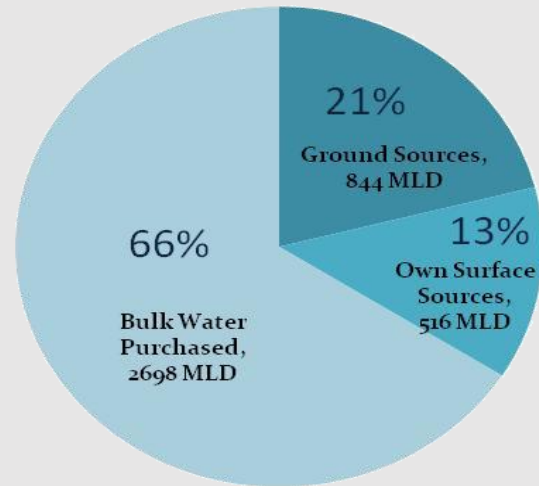


NEXT NEWS >

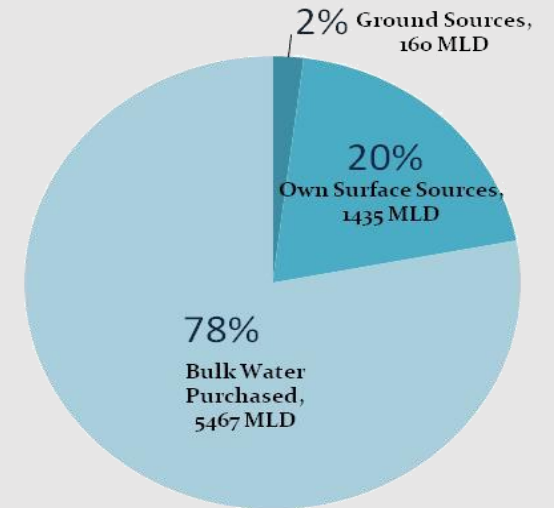
By Susan Chacko
Published: Wednesday 10 November 2021

Increasing dependency on distant sources of water, need to sustain own sources of water

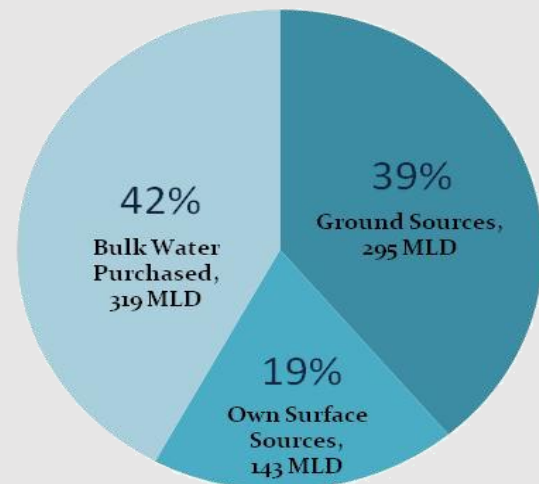
Gujarat



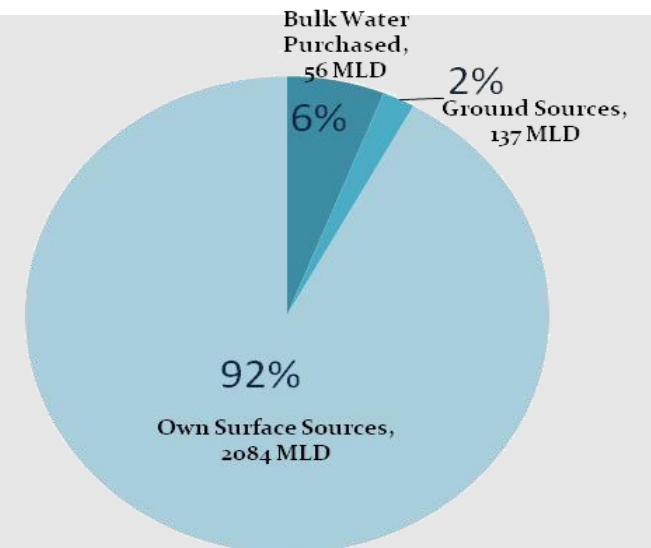
Maharashtra



Chhattisgarh



Telangana



Source: State data book on service level benchmarks, PAS Project, CEPT university (2014-15 & 2015-16)

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

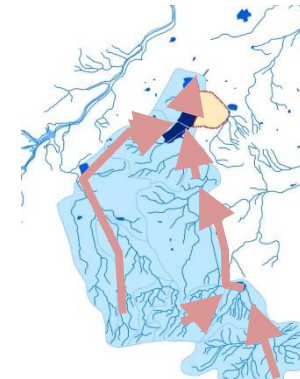
Traditional Water Systems in Bhuj



Water conservation and ground water recharge



Canal linking the catchments



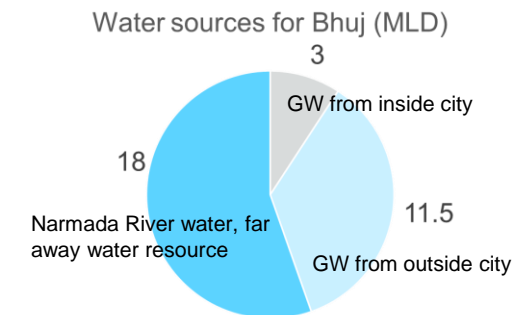
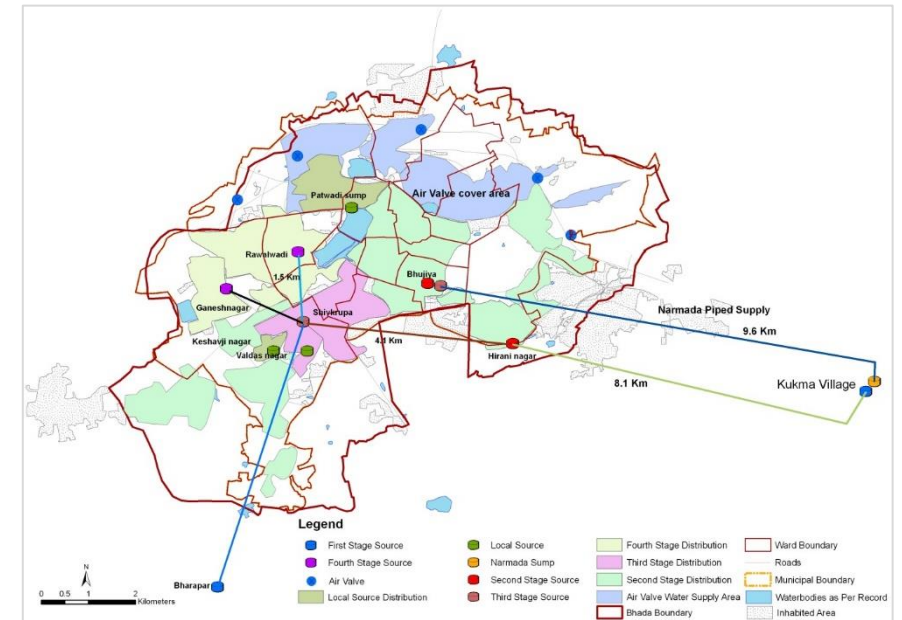
Interlinked catchments and lakes



Community managed lakes and well systems

With growing population, Bhuj moved towards piped water supply

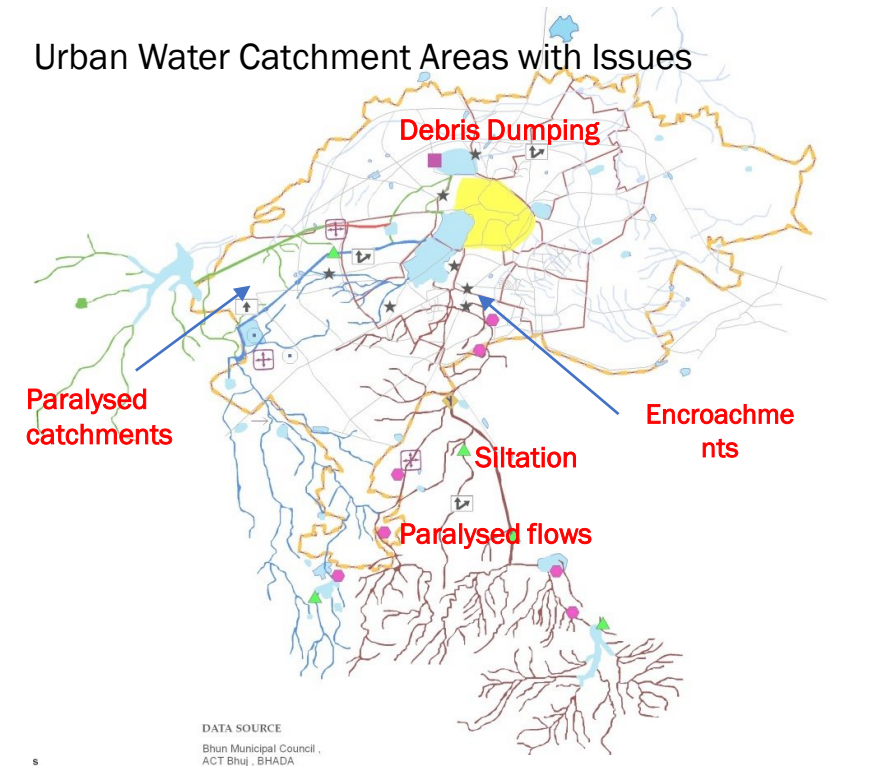
- Due to dependency on modern water supply systems and large scale basin transfer projects it had lost its traditional systems
- It focused on making development plans, with a total disregard for the traditional systems of lakes, design of their catchment systems and water harvesting.
- Bhuj is now relying on bulk water import from river Narmada, which is far away from the city.



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

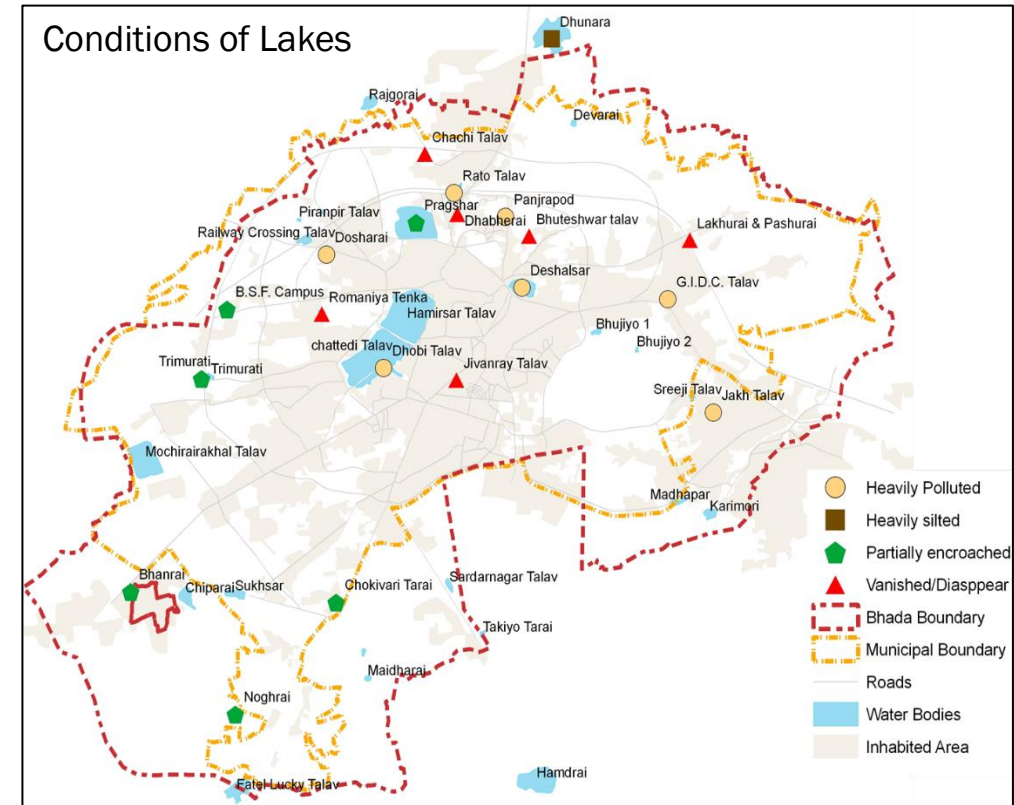
Urban Water Catchment Areas with Issues



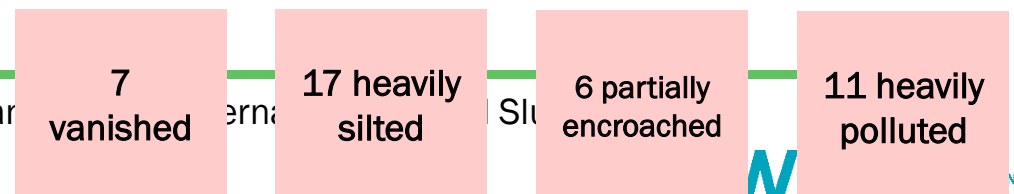
	Water Stagnations		Relocation Sites
	Waste Water Inflow		Paralysed Flow
	Siltation		Encroachment
	Sandstone Quarry		Dense Prosopis Juliflora
	Damaged Diversion		Debris Dumping
	Roads		Municipal Boundary
	Water Bodies		Ward Boundary

Collapse of interlinked catchment system

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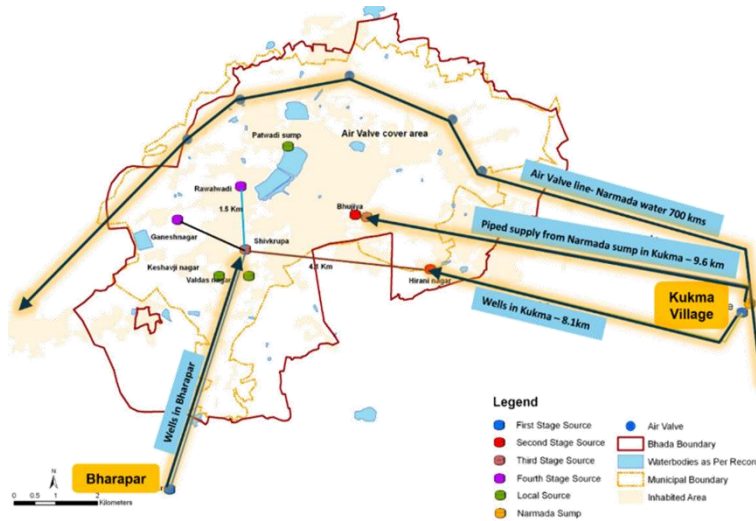


From **66** lakes to **29** existing and visible lakes

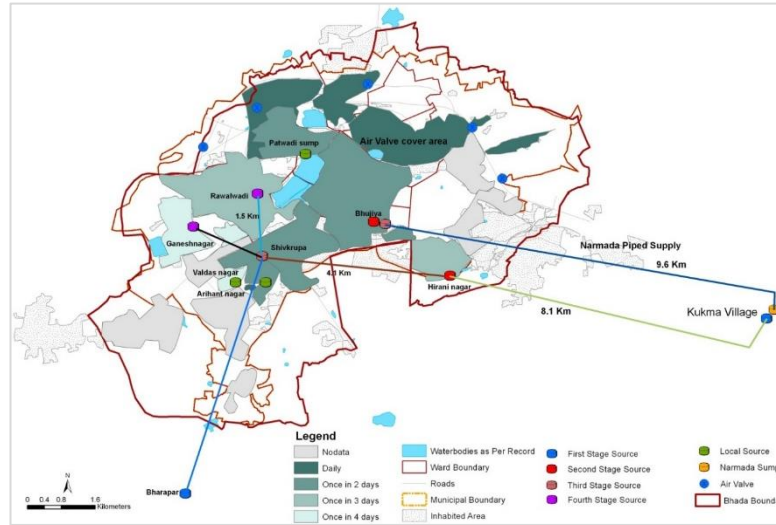


Bhuj: Facing same issue as any modern city in recent times

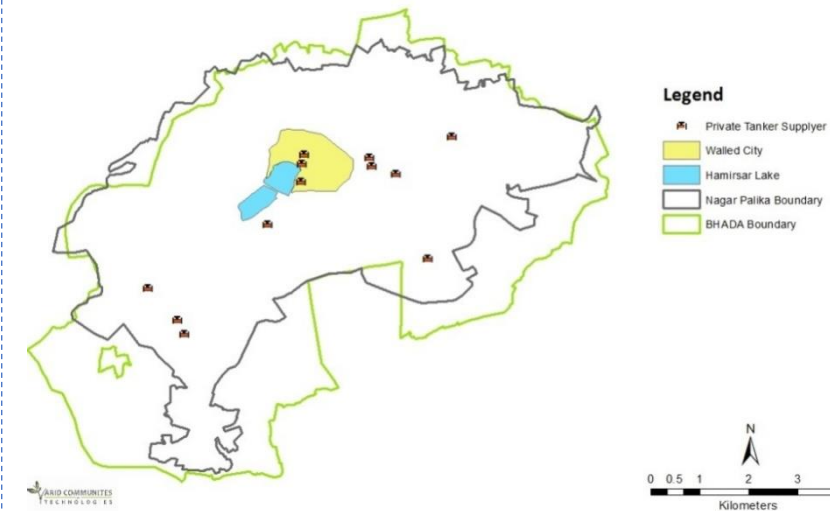
Ranging far and wide for water



Daily supply not available in most areas despite having enough total supply to support ~175 lpcd



Active private water market



A local NGO took initiatives towards water security in Bhuj

- The local community led by a NGO – Arid Communities and Technologies (ACT), is making efforts in reviving traditional water conservation and exploring alternative water supply systems through participatory management.
- CWAS, CEPT University is the Knowledge Partner to Arid Communities and Technologies (ACT) for ground water management activities in the city of Bhuj, Gujarat

Technical studies



Community Mobilization



Advocacy to Local govt.



Revitalization of urban watershed using pilot demonstrations and exploring alternative sources



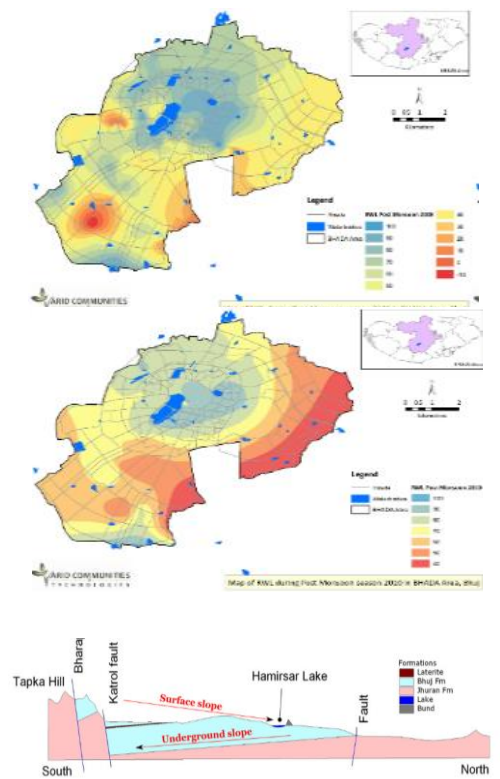
Technical studies with community mobilization were the major steps taken

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
'Jalstrot Sneh Samvardhan Samiti' (JSSS – Water source conservation committee) was formed to carry forward the work of awareness, advocacy and participatory water management like 'water walks', programmes for school children, lake conservation drives etc.

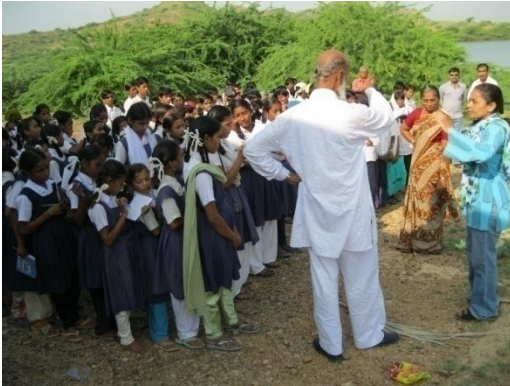
'Parab' – Trained Para-hydrogeologists as Local Champions



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Various initiatives for community mobilization

Education Tours



Tours to water bodies of the city



Mass Awareness



Lake Cleaning Drive

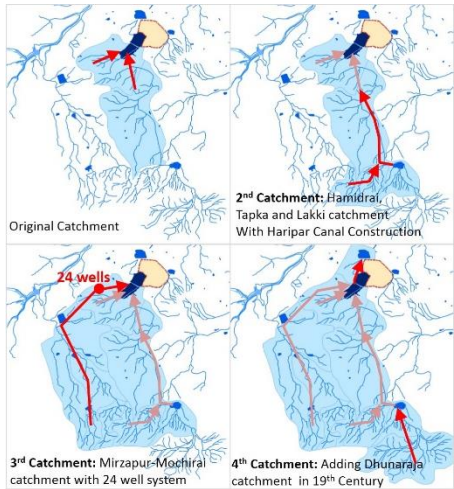


Community Institution Formation



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



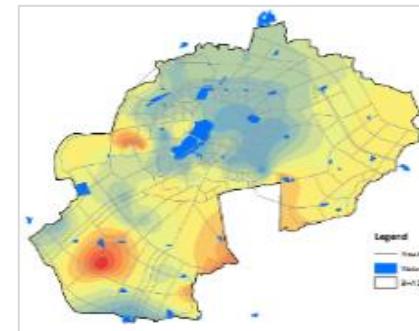
Student managed rain water harvesting in school for drinking water supply

Wastewater Reuse

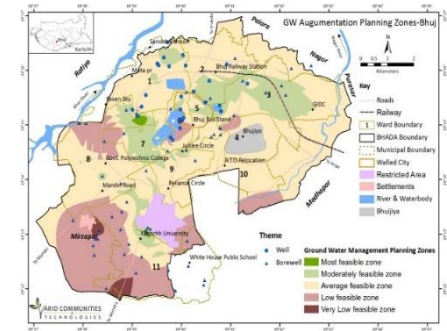


Greening by DEWATS

Groundwater recharge



Viability of groundwater borewells



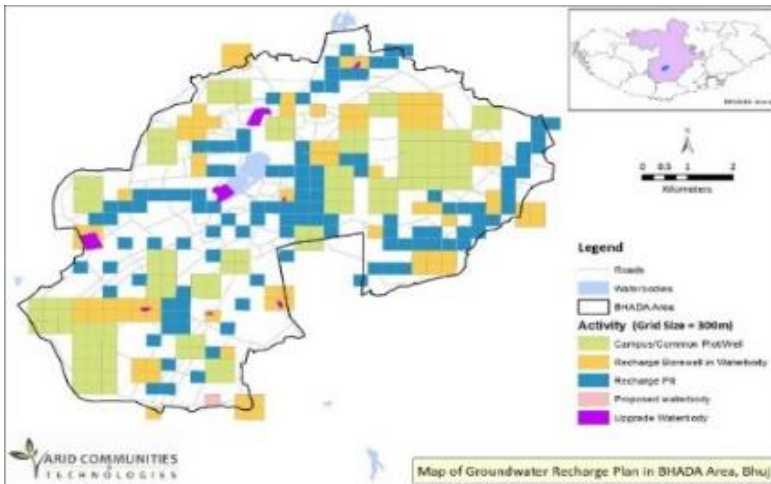
Creating GW recharge structures



Flood control through GW recharge for a housing colony

Advocacy to Local government and Convergence with existing national programs

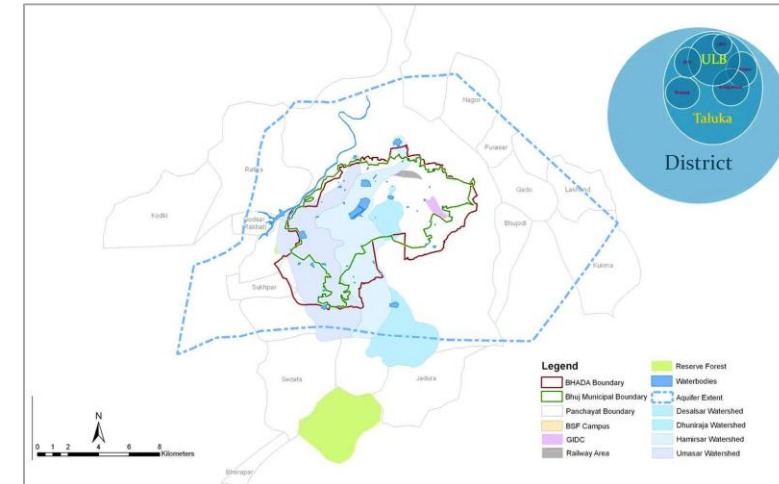
Inclusion of hydrogeology in land-use planning



Sensitization workshops for officials

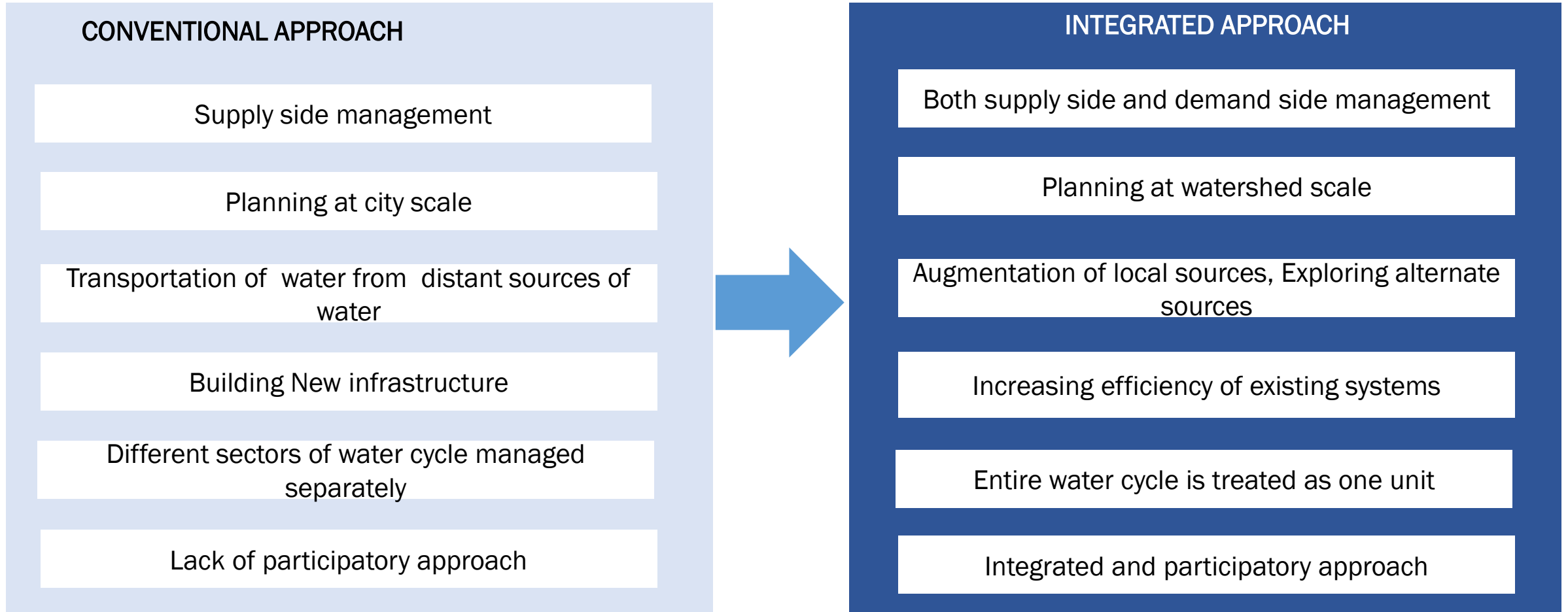


Strengthening institutional framework



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Need to move away from conventional approach



Moving two cities in Gujarat, India towards water security

Gandhidham and Anjar, two cities of Gujarat facing water supply and resource challenges are working on various approaches to achieve water security



Assessment of Existing water Situation



Development of Water Security Plan



Implementation of Pilot Demonstrations



Documentation and Dissemination

Stakeholder consultations



Water supply systems assessment

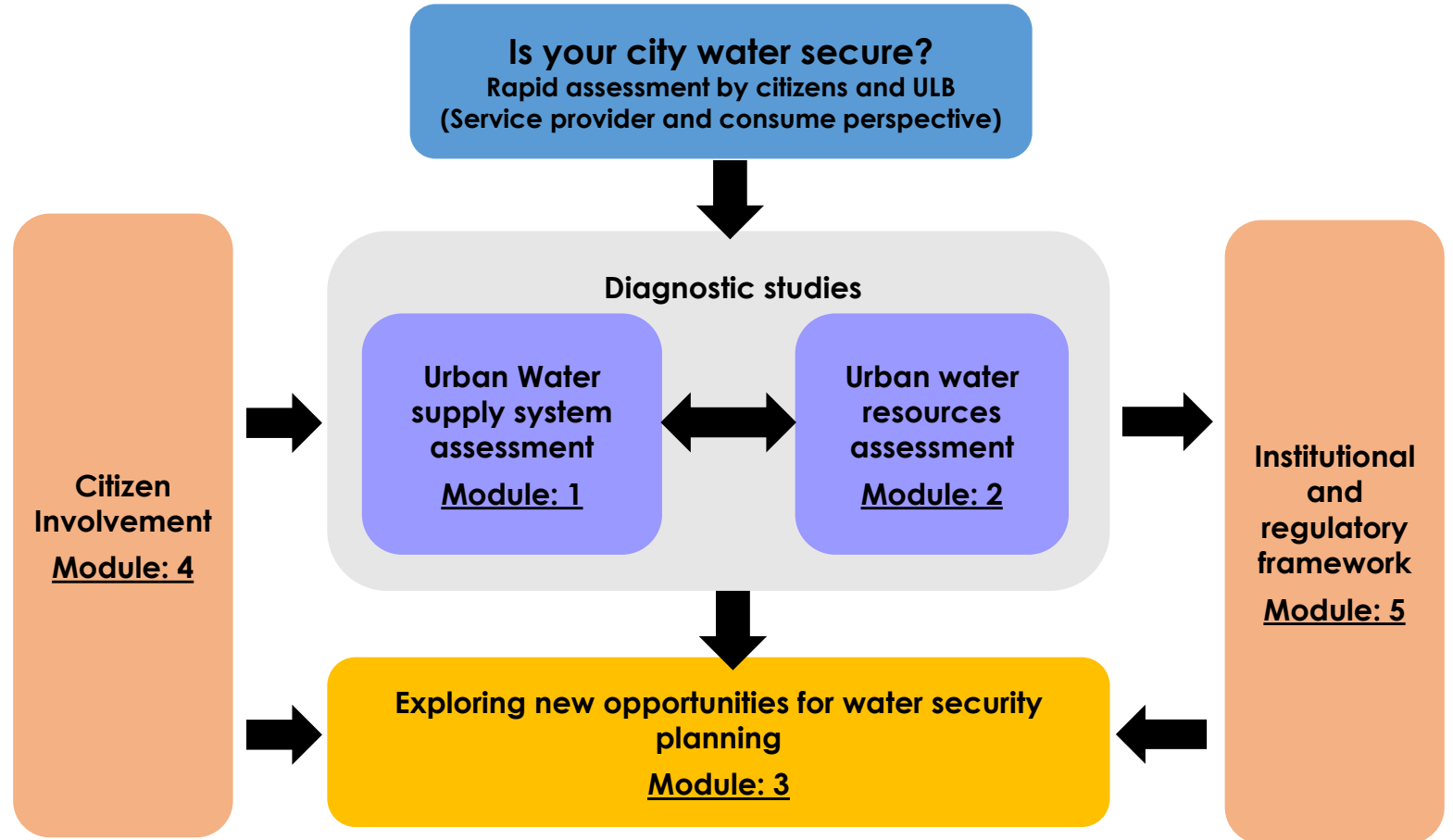
Feasibility study for GW recharge and RWH



How to replicate in other cities???



Urban Water Security Planning Toolkit	
1 Need and concept of this toolkit	M1 Urban water supply system assessment <small>Service and Citizen Issues and challenges Future demand</small>
2 Approaches and toolkits for water security planning	M2 Understanding urban water resources <small>History of use Rainfall Surface water and watersheds Aquifer and Groundwater</small>
3 Introduction: Urban Water Security Planning Toolkit	M3 Exploring new opportunities for water security planning <small>WWT GW Recharge Source Revival WW Reuse Reducing NRW Improving quality Metering Continuous supply Demand management</small>
? Is your city water secure? Rapid assessment by citizens and ULB	M4 Citizen involvement in water resources management <small>Awareness and campaigning Technical demonstrations Involvement in decision making Involvement in assessment and implementation</small>
	M5 Institutional and regulatory framework <small>Institutions Acts Regulations Policy Stakeholders Gap assessment Strengthening framework and institutions Capacity building</small>



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Thank you

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CEPT
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<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.



cwas.org.in



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