Rethinking urban water management: Improving water security through participatory groundwater management

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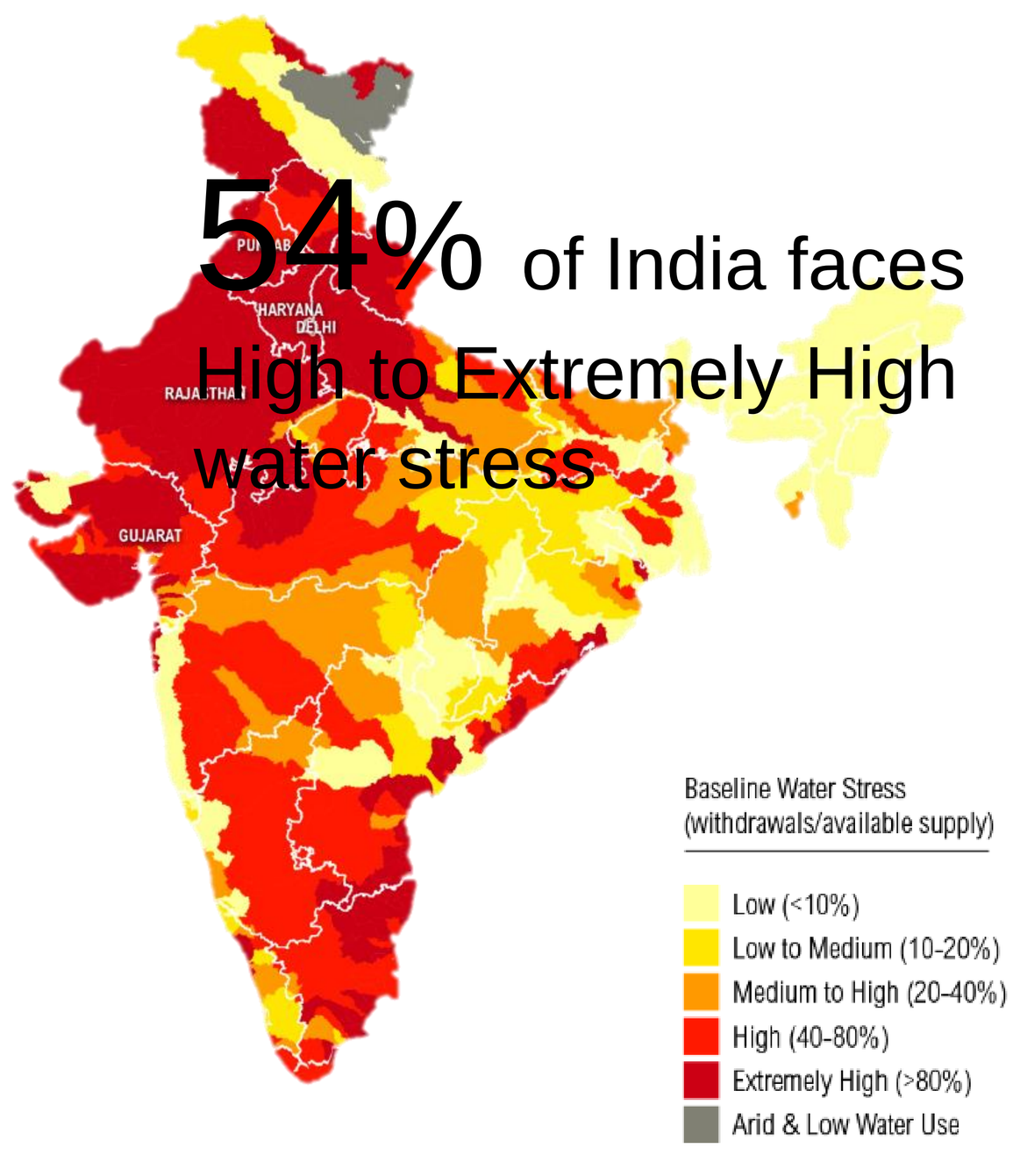
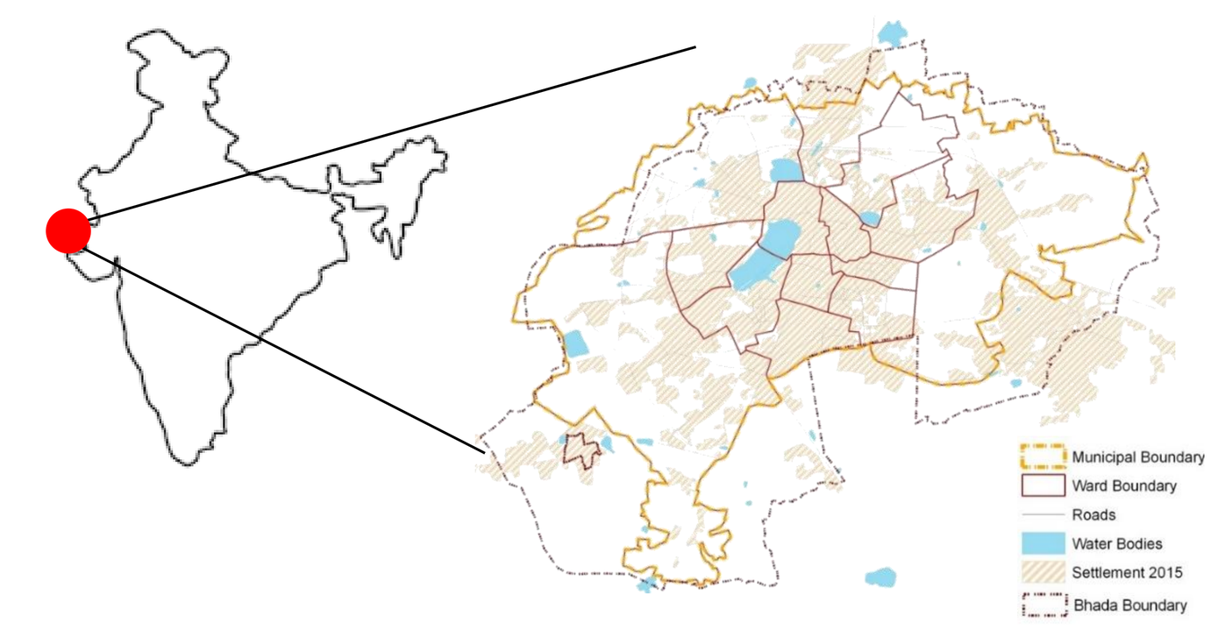
Water Scarcity and Urbanization



Source: World Resource Institute, 2017

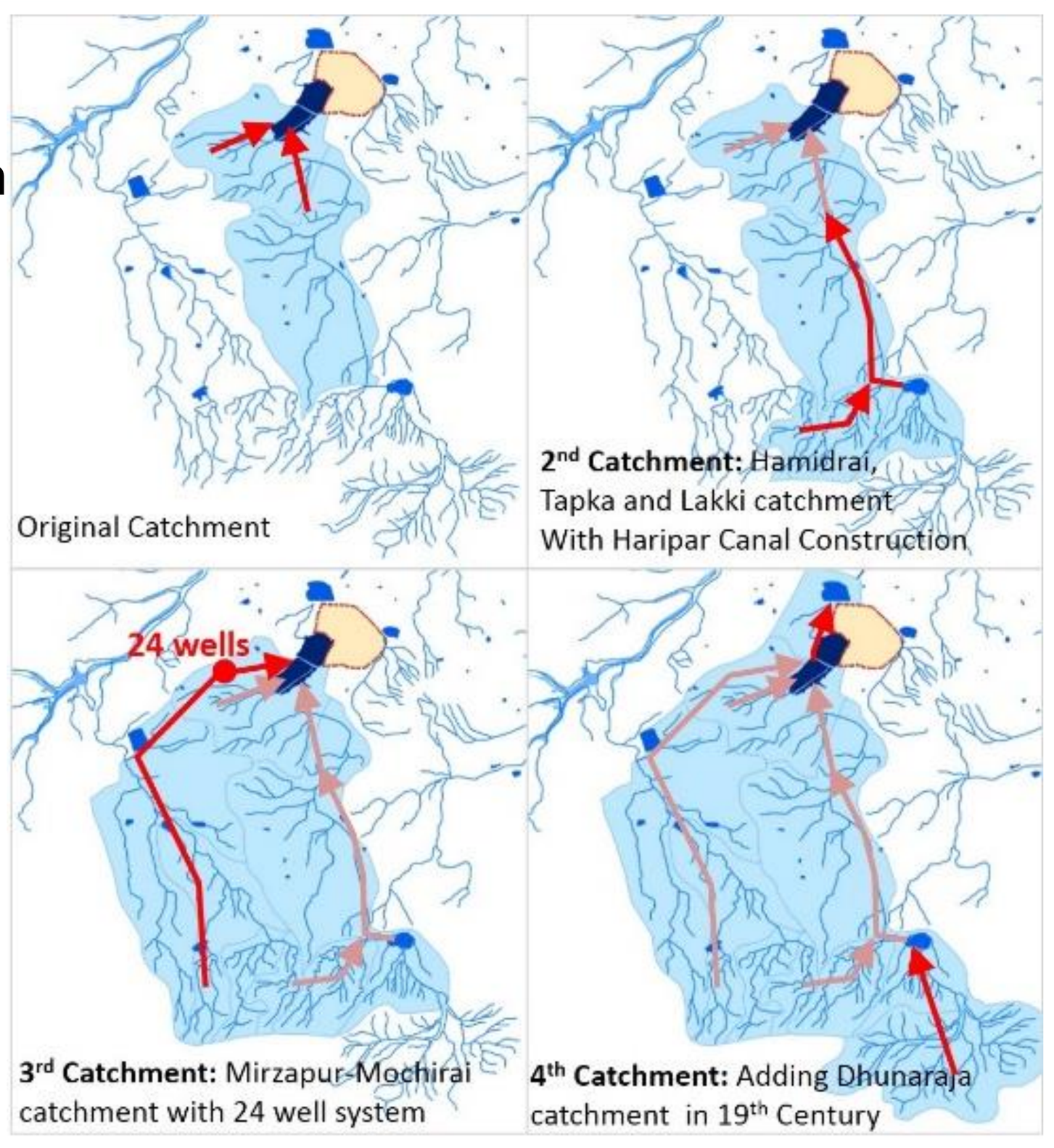
- Climate change and erratic rainfall
- Increasing population and water demand
- Competition in sectors - Agriculture, industry, household
- Overexploited, unregulated and depleting groundwater
- Deteriorating infrastructure
- Increasing dependency on distant sources
- Large, heterogeneous communities averse to change
- Rivers and lakes are polluted and drying

Traditional water management in Bhuj



- 1.8 lakh population
- 56 sq km area
- 430 mm annual rainfall

- In the past, Bhuj has survived in arid Kachchh through traditional water management practices.
- The entire catchment system was well-managed and activities such as de-silting and cleaning of lakes, cleaning of channels in catchment areas, and cleaning of canals were done regularly.
- The lake system helped to recharge the aquifers.

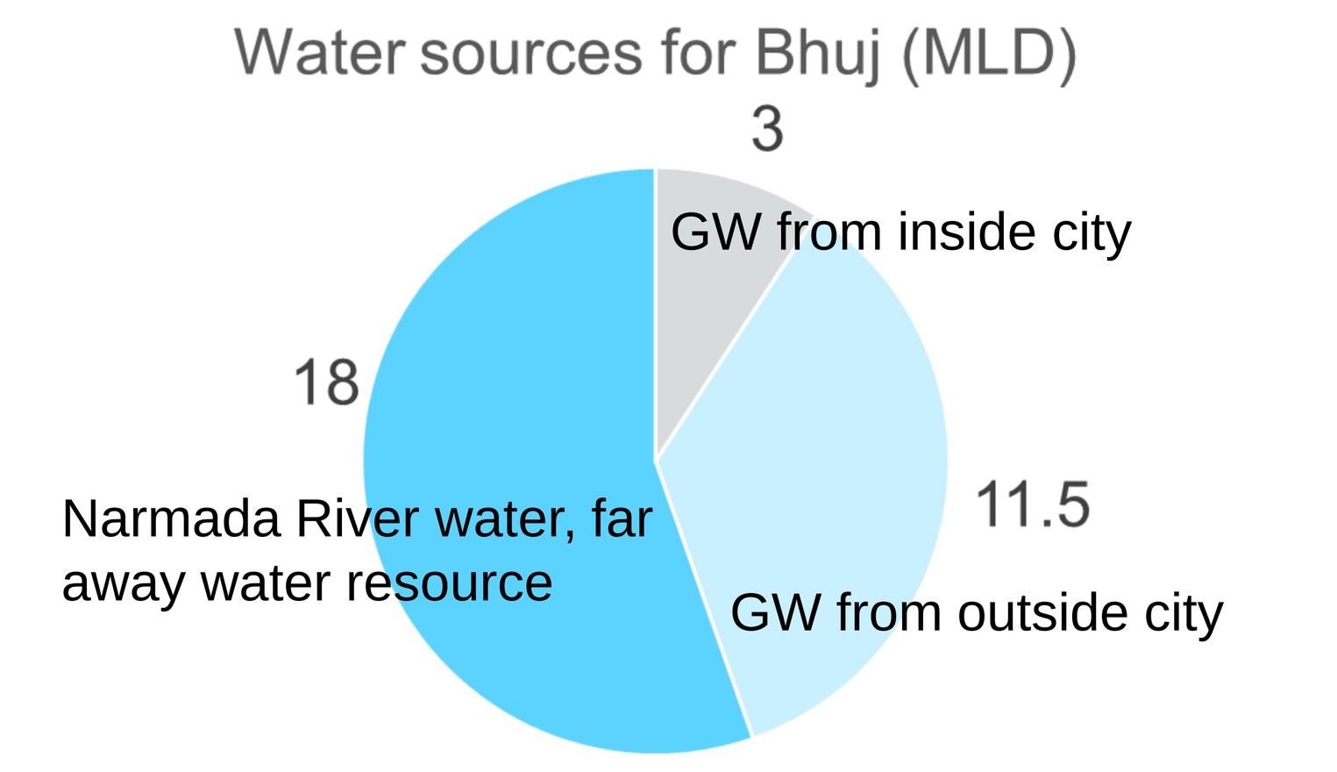


Source: Developed by CEPT University, adapted from Raman, 2014

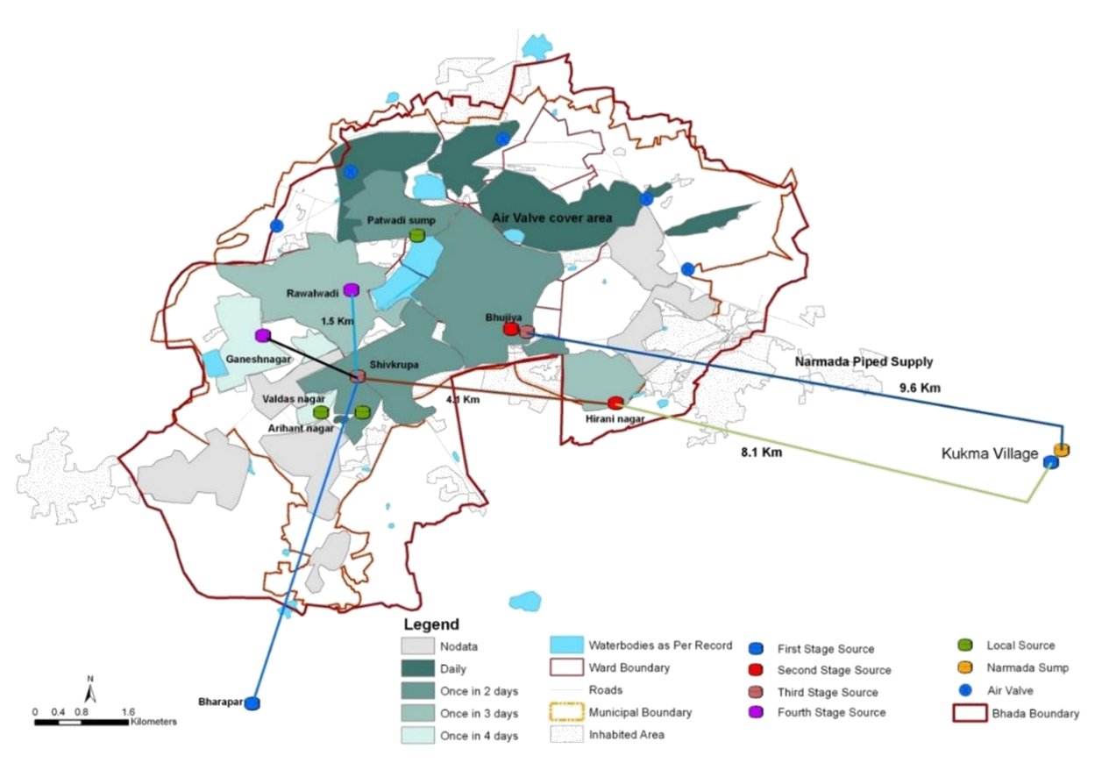
Present water supply systems in Bhuj

- With growing population, Bhuj decided to move towards piped water supply.
- In the recent past, due to dependency on modern water supply systems and large scale basin transfer projects it had lost these traditional systems and was being threatened with water scarcity.
- The urban development process in Bhuj during this period was 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.
- In recent years, the local community led by a NGO - ACT, is making efforts in reviving traditional water conservation and exploring alternative water supply systems through participatory management.

Ranging far and wide for water

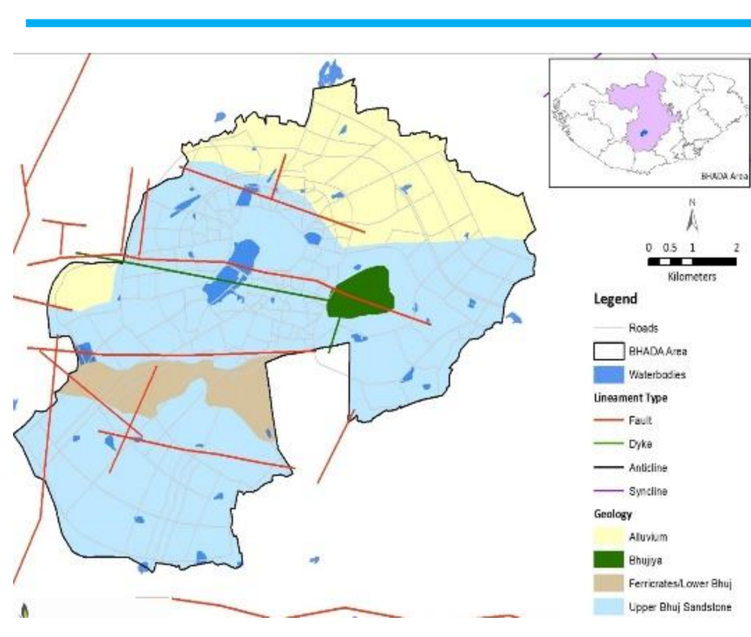


Not adequate water supply and poor water quality

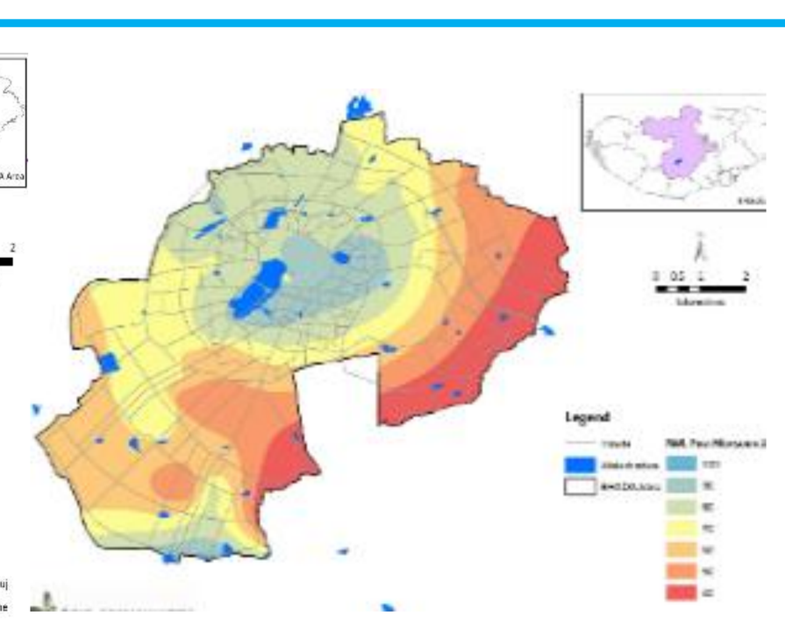


Steps taken for participatory groundwater management

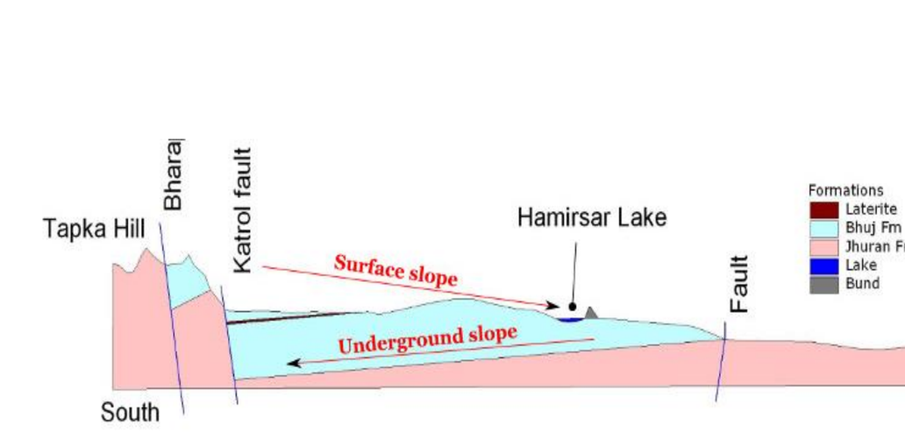
Technical studies as backbone for work



Hydro-geology of Bhuj



Groundwater level in Bhuj



Understanding Geology of Bhuj

Community Mobilization

- Citizen forum - JSSS Jalstrot Sneh Samvardhan Committee (Water resource development committee**)**
- **Parab' – Trained Para-hydrogeologists as Local Champions**
- Jalgatha - "Water story walks" explaining local hydrogeology and lake cleaning drives

Exploring alternative water supply systems with community participation

Revival of local, traditional sources

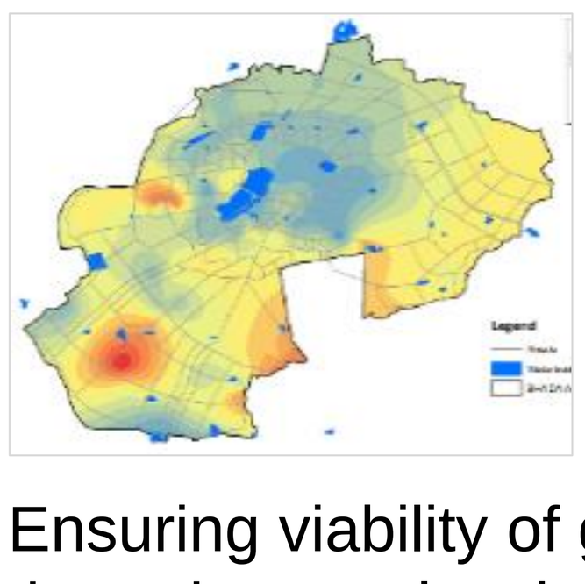
Repairing traditional lake catchment system

De-silting lakes with public participation

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

- Activity implemented through labour donation drives by the citizens.
- This solved flooding issues and the lakes were seen to fill up in the subsequent monsoon.
- Groundwater levels have also been seen to improve.
- The citizen community also formed dedicated Lake Committees
- Lobbied for legal recognition of the lake area in the city's landuse plan to save them from encroachment.

Groundwater recharge



Ensuring viability of groundwater borewells through water level monitoring and recharge activities. Flood control through GW recharge

Rainwater Harvesting

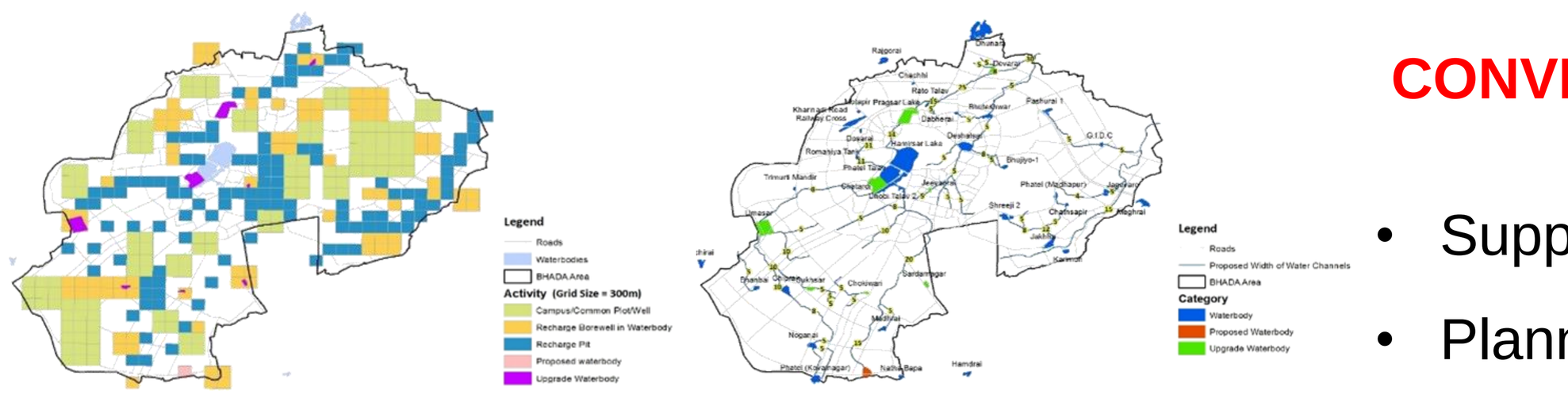
Rain water harvesting in school for drinking water supply

Wastewater Reuse

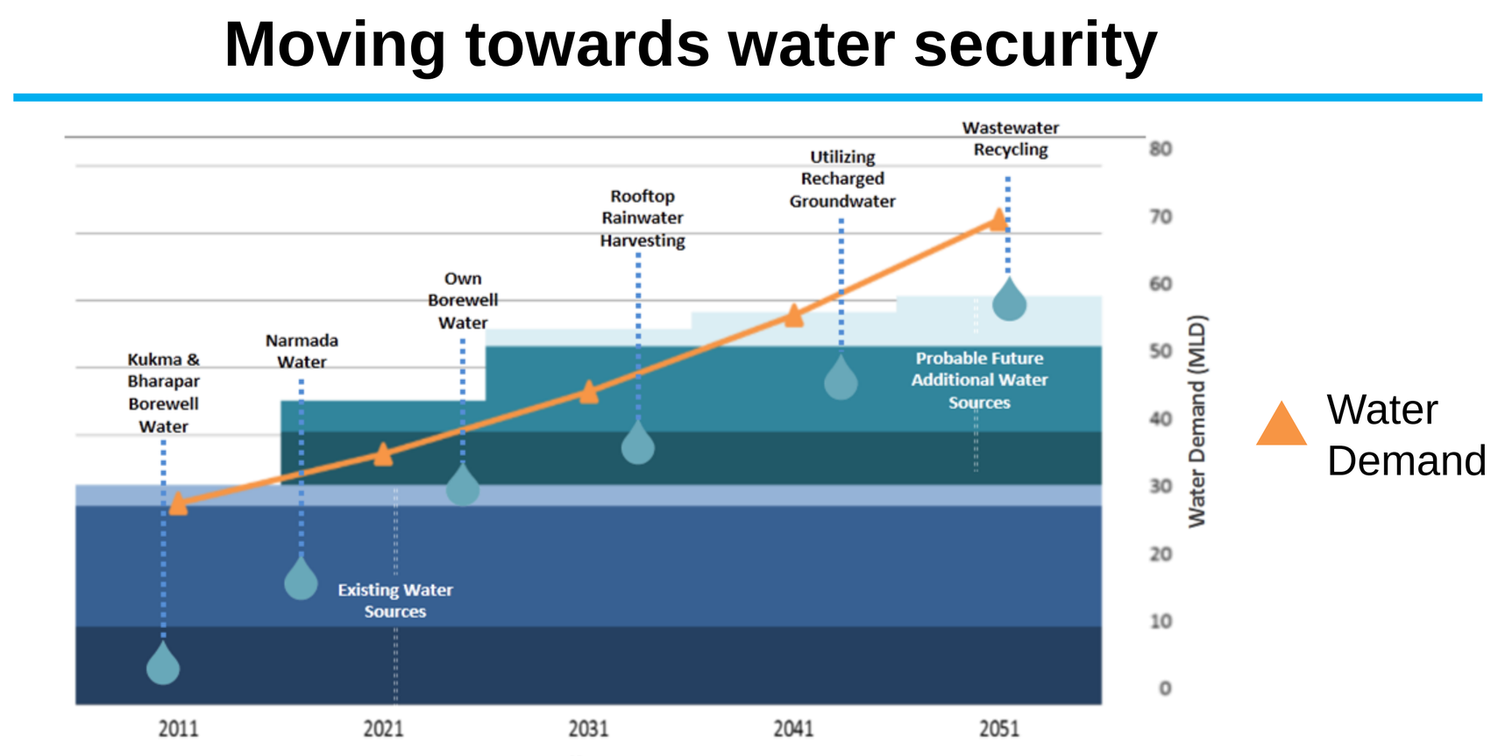
Greening by DEWATS

Envisioning a Water Secure City

Inclusion of hydrogeology in land-use planning



Moving towards water security



Source: Developed by CEPT University

Need to move towards Integrated Approach

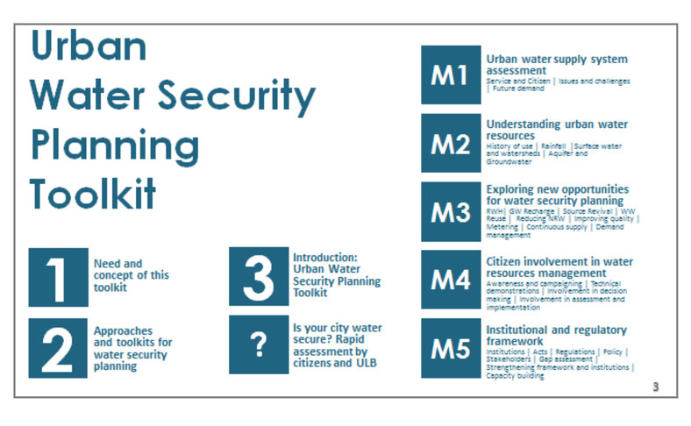
CONVENTIONAL APPROACH

- 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

Urban Water Security Planning Toolkit



SCAN ME

Is your city water secure?
Rapid assessment by citizens and ULB
(Service provider and consume perspective)

Diagnostic studies

- Citizen Involvement — **Module: 4**
- Urban Water supply system assessment — **Module: 1**
- Urban water resources assessment — **Module: 2**
- Exploring new opportunities for water security planning — **Module: 3**
- Institutional and regulatory framework — **Module: 5**

Source: Developed by CEPT University

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Source for all images and maps except mentioned: Arid Community and Technologies, Bhuj, India

CEPT University is the Knowledge Partner to Arid Communities and Technologies (ACT) for ground water management activities in the city of Bhuj, Gujarat. This project was funded by Arghyam, Bangalore. Through C-WAS, CEPT is supporting ACT in documentation of processes related to Participatory Ground Water Management (PGWM) in Bhuj. Based on this study, C-WAS has developed Urban Water Security Planning Toolkit.