Innovative approaches for making cities water secure in Arid regions of Gujarat

Priyadarshini Choudhary and Dipti Tanna
CWAS-CRDF, CEPT University

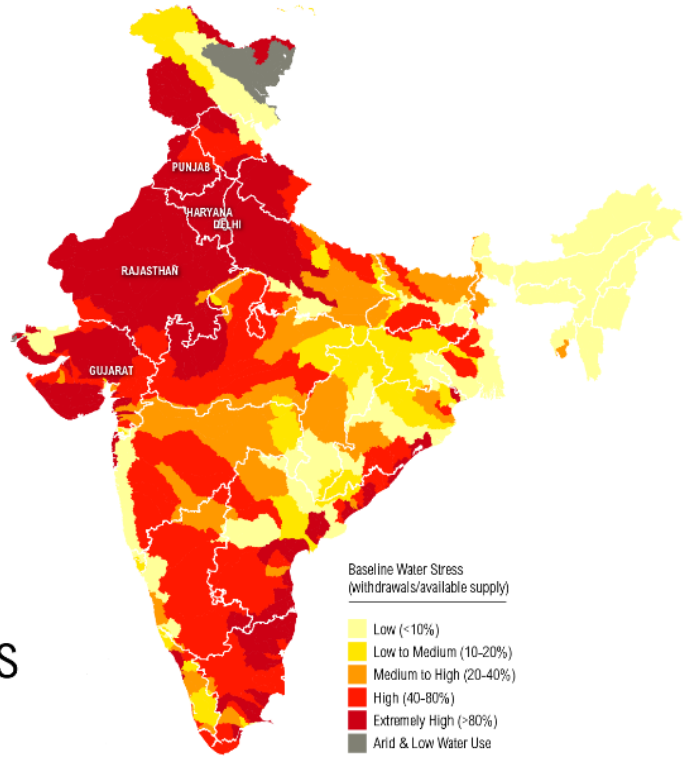
Global South Academic Conclave on WASH and Climate 2025

21st - 23rd February 2025, Ahmedabad

The threat of water scarcity or “Day Zero” is looming towards Indian Cities…

- **India is expected to become ‘water stressed’ by 2025 and ‘water scarce’ by 2050***
- **21 major Indian cities are expected to deplete their groundwater by 2020****
- **Water availability is becoming less predictable** in many places with **increased incidences of flooding and droughts.**

54% of India Faces **High** to **Extremely High** Water Stress



www.indiawatertool.in

WORLD RESOURCES INSTITUTE

- **Equitable access to safe drinking water continues to remain a challenge. Low-income communities, are the most vulnerable**

Chronically drought prone region with a **frequency** of once in every **2.5 years**


Kutch in the grip of worst drought: Desert grit


'We can only watch our animals die': A drought disaster in Kutch


In Kutch, history has a habit of repeating itself

Rutam V Vora | Bhuj, March 28 | Updated On: Mar 28, 2019

The region is witnessing its worst drought in 30 years; 16 of its 20 dams have gone dry; there is drinking water but nothing for cattle; and yet, its people remain resilient

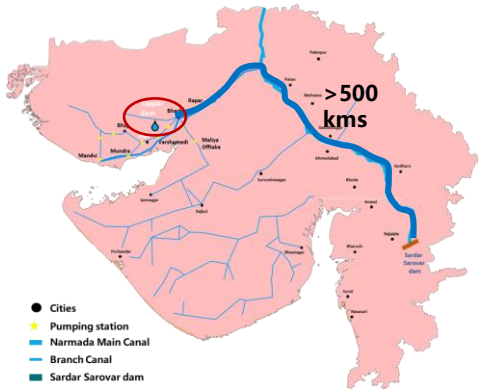

THE TIMES OF INDIA

Rains pound Gandhidham, Anjar towns in Kutch

Gujarat Braces for a Wet Weekend; Heavy Rain Alerts Issued over Kachchh, Jamnagar, Sabar Kantha, Surendranagar, Mahesana

Frequent **Urban flooding** scenario in **major parts** of the cities

- **Over exploitation of ground water,** which is further aggravated by **salt water intrusion**
- **Dependent on Narmada Water**

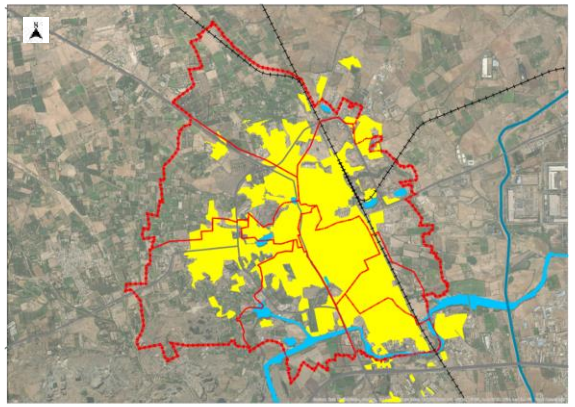


Study objective and area - Anjar and Gandhidham...

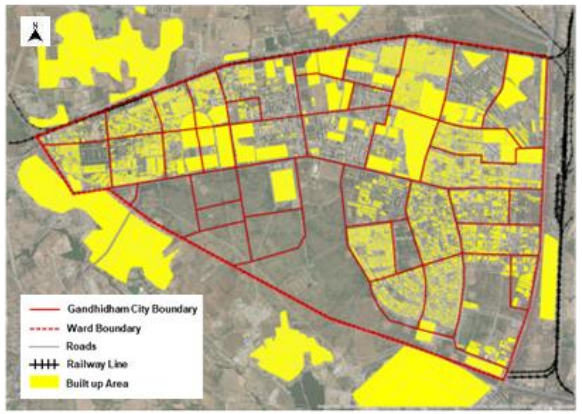
- **Assessment of Existing water Situation in both the cities**
- **To develop water security action plan**
- **Implementation of Pilot Demonstrations**
- **Documentation and Dissemination**

The study has four main objectives, which **assess the existing scenario of water** and based on the output, develops **action plan across service chain**.
The project also includes **action-oriented pilot demonstrations** around RWH and GWR. The complete project along with **scaleup plan will be documented**.

- **Kachchh** is the **largest district of Gujarat State**;
- Spread over **45,674 km2**
- Kachchh region falls under **arid-semi arid zone**

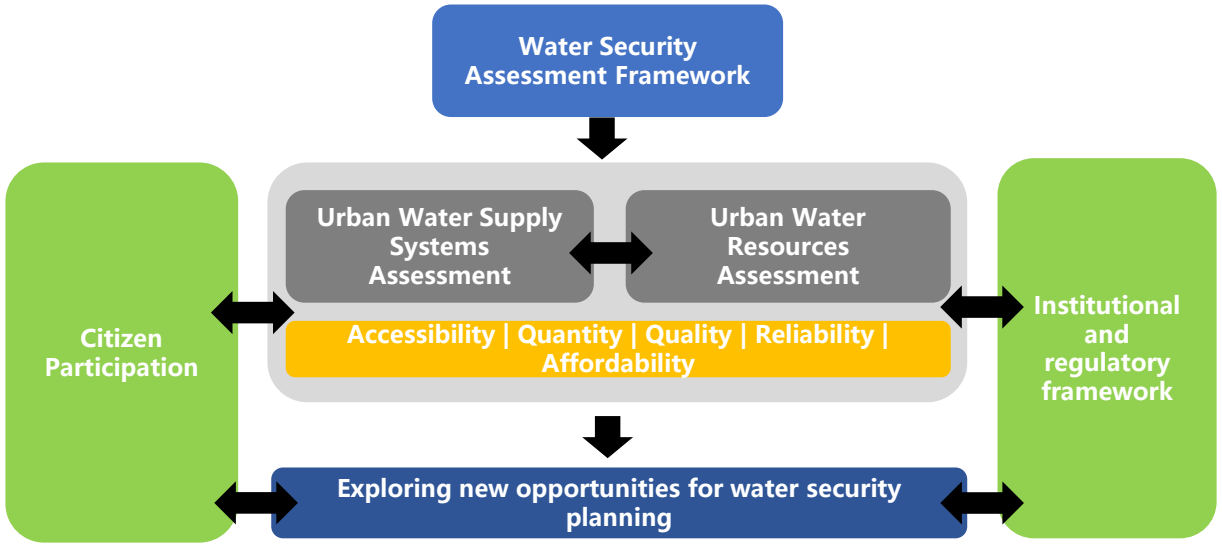


17.81 Area (sq. Km)
9 Wards
1,09,238 Population (2021)
26,036 Households (2021)
29,214 Slum Population (2021)
29 slum pockets
9,770 Slum HH (2021)
25% of total population



30.50 Area (sq. Km)
13 Wards (SRC)
13 Sectors (KPT)
4,10,000 Population (2021)
87,280 Households (2021)
69,880 Slum Population (2021)
17 slum pockets
13,950 Slum HH (2021)
17% of total population

Water Security framework developed for assessing the service chain, identified key challenges and improvement strategies..



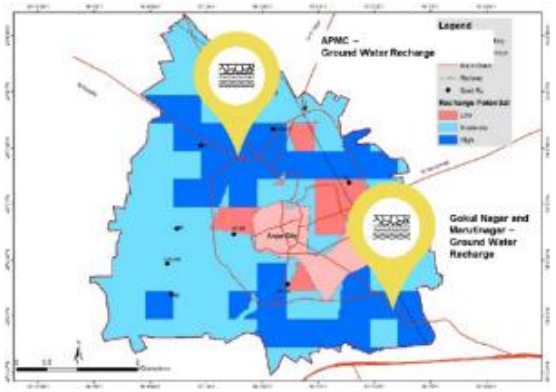
Key Challenges identified

- High dependency on **distant water** and no planning to **augment own/local water** sources
- Issues related to **Water supply in Slum pockets**
- **Urban Flood** situation during monsoon
- **Intermittent water supply** – Anjar - alternate day; Gandhidham – once in 3-4 days
- Prevalent presence of **Private water market** (water tanker and bottled water), in Gandhidham

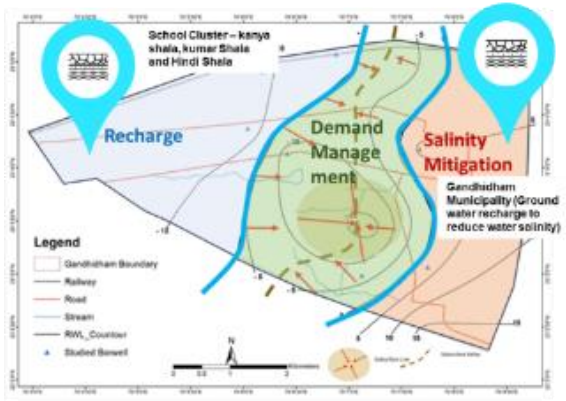
1. Augmenting water sources
2. Improving Municipal Water Services
3. Strengthening Institutional and financial framework
4. Generating Awareness and Engagement

Geohydrological study to understand the water behaviour below ground...

Identification of Potential rainwater recharge sites

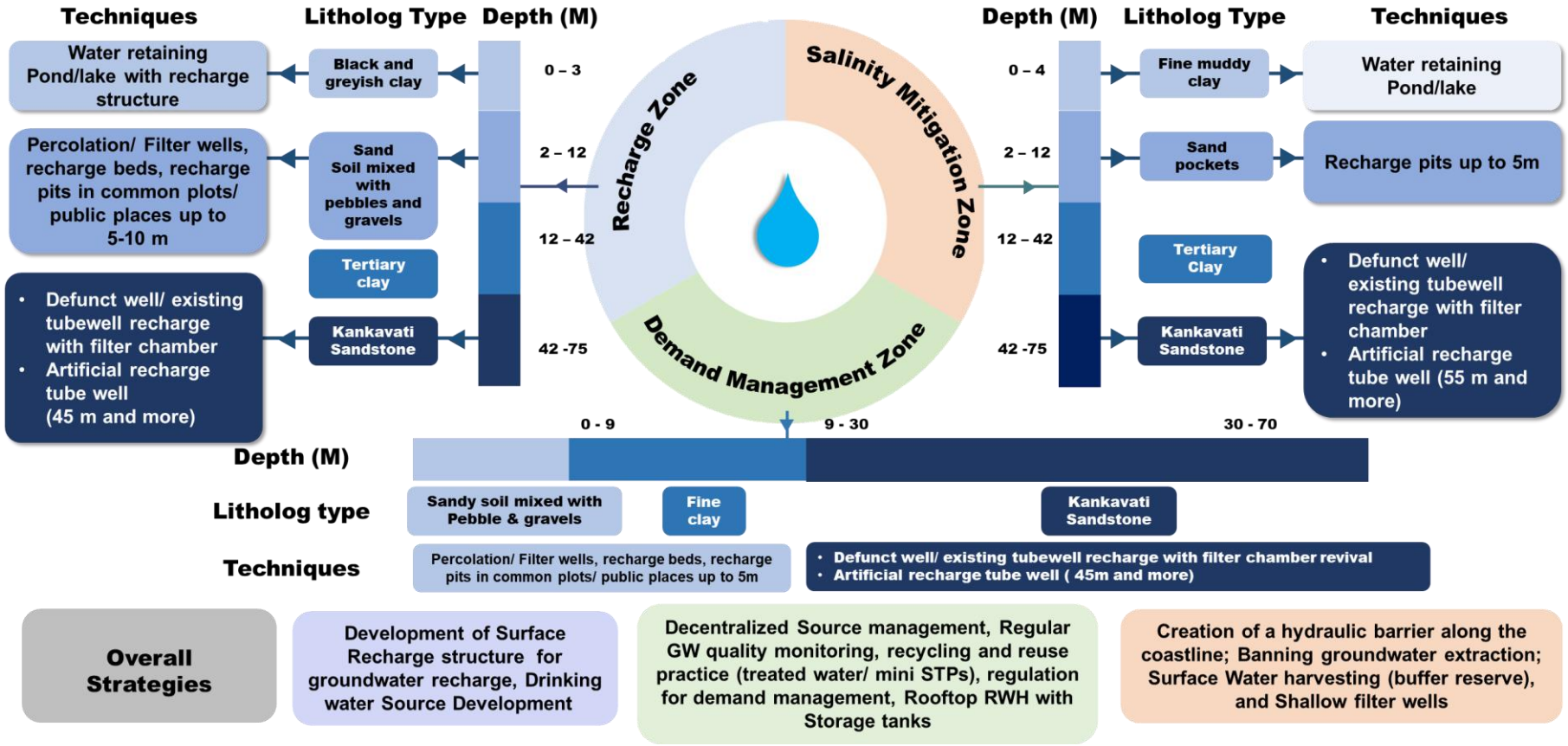


Anjar



Gandhidham

Zone-wise Recharge Techniques developed for Gandhidham based on Geohydrological study



Overall Strategies			
	Development of Surface Recharge structure for groundwater recharge, Drinking water Source Development	Decentralized Source management, Regular GW quality monitoring, recycling and reuse practice (treated water/ mini STPs), regulation for demand management, Rooftop RWH with Storage tanks	Creation of a hydraulic barrier along the coastline; Banning groundwater extraction; Surface Water harvesting (buffer reserve), and Shallow filter wells

Source: Study conducted by Arid Communities and Technologies (ACT) for CWAS

Pilot demonstrations at various levels based on Geohydrological study…

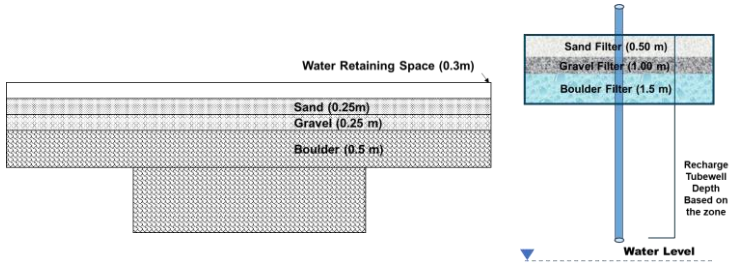
Gandhidham – Group School

- 15 VJT Tanks with **40,000+** liters storage capacity for 3000+ students
- Drinking water available for lean period
- Mitigation of flooding during the rainy season

Anganwadi – DC 5 (Gandhidham)

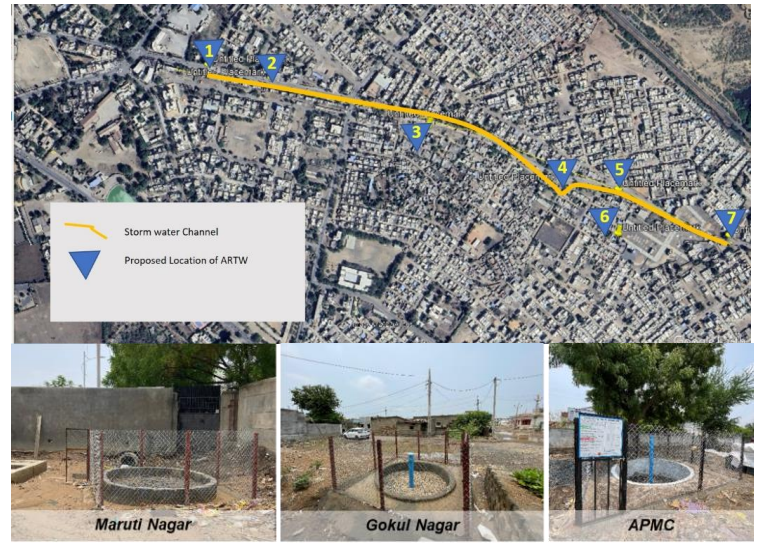
3000+ liters water available year-round for cooking and drinking purpose

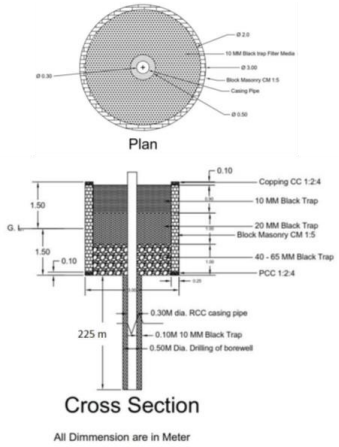
Anjar School



- **Flood Mitigation** and **GWR**
- Combination of **Filter bed** and **Artificial recharge tubewell**

Anjar Urban flooding spots





- **Replenishing groundwater** through recharge structure
- **No water logging**, **eliminates** potential **breeding grounds** for mosquitoes, contributing to **healthier surroundings**

Before and after pictures of the pilot demonstration showcasing the visual impact...

Gandhidham Group School

Anjar – Urban Flooding spot

Gandhidham Anganwadi

Anjar – Group School

IEC is an integral part of the project to generate awareness about the importance of RWH and GWR… (1/2)

1200+ *visitors from various walks of life visited the Mela*

Visitors included – MP, MLA, Government Officials, Development Authority, Armed forces, citizens

12+ *vendors Participated*

500+ *school students*

***35+** villagers from nearby villagers visited the Mela*

"Nukkad Natak" on water conservation

IEC is an integral part of the project to generate awareness about the importance of RWH and GWR... (2/2)

Viksit Bharat Yatra

- **200+** Visitors visited CWAS booth along with city representative, officials etc...
- Generated awareness
- Connected with Development Authorities and various active grouups

Seva Setu

Ramnavami Rally - Anjar

- **+8 km** stretch rally drawing **30,000-35,000** people.
- Showcased posters and videos around RWH/GWR techniques
- Informed people regarding the city's water service chain – Source, treatment, storage and distribution

Workshops and trainings

- **50+ Engineers/Builders/ Architects**
- **35+ Plumbers**
- **30+ School Teachers**

Trained and made aware about the importance of RWH/GWR

Impacts and Achievements of our work...

Geohydrology study
carried out for 2 cities – Anjar and Gandhidham

14 Pilot Projects
for RWH and GWR to conserve rainwater, groundwater replenish, and urban flood mitigation

6 RWH Pilot Projects with 45,000+ Storage Capacity
Available for 3000+ students

8 GWR Pilot Projects with 3.5 crore+ groundwater recharging
Spread across the city to mitigate urban flooding

100+ Professional trained
and made aware about the importance of RWH/GWR including Engineers, teachers, plumbers etc.

1200+ visitors
from various walks of life visited the Jal Sanrakshan Mela, including MP, MLA, Government Officials, Development Authority, Armed forces, villagers, citizens

Thank You

Global South Academic Conclave on WASH and Climate 2025

CWAS CENTER FOR WATER AND SANITATION
CRDF CEPT UNIVERSITY
CEPT UNIVERSITY FACULTY OF PLANNING
Gates Foundation
viega foundation