12th Regional 3R and Circular Economy Forum in Asia and the Pacific

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Circularity towards water security in India

Theme: Realizing Circular Societies Towards Achieving SDGs and Carbon Neutrality in Asia-Pacific

Presented by

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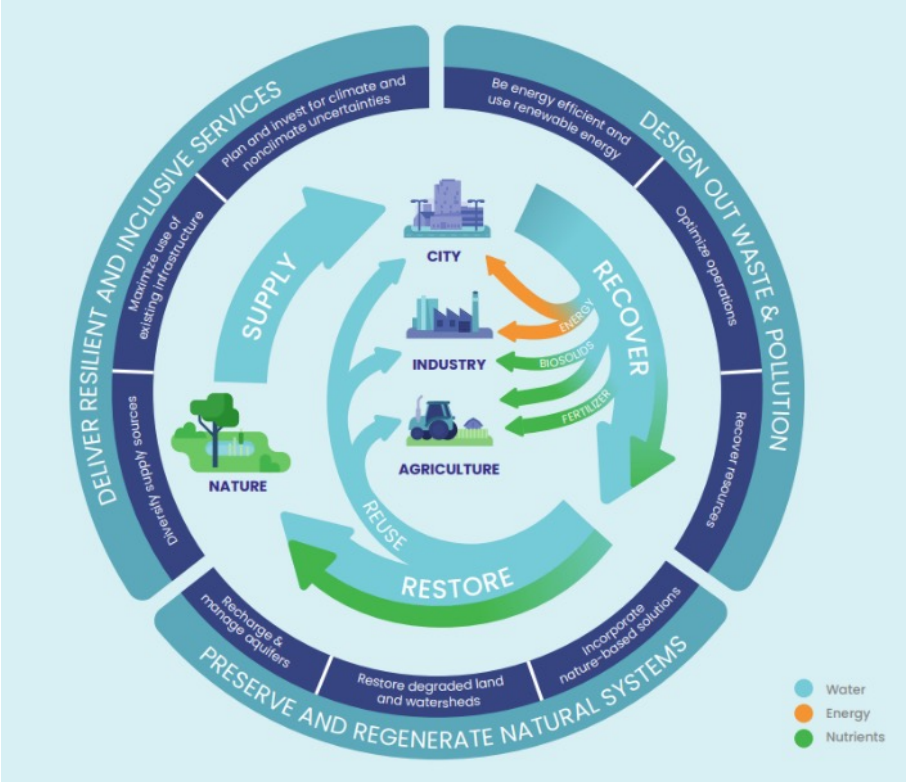
Circular Water Economy

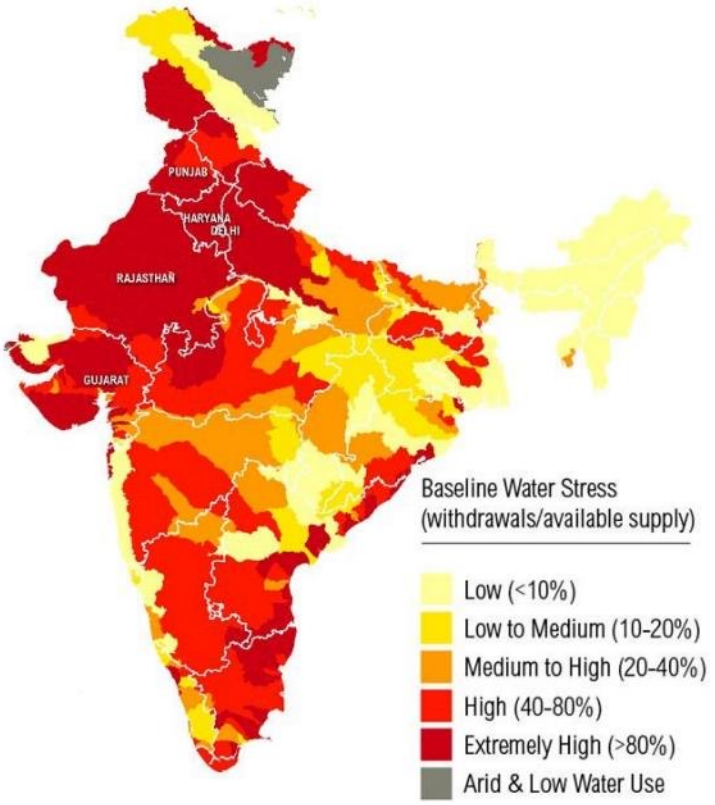
A circular water economy (CWE) recycles and recovers resources within the water use and treatment cycle to maximize value for people, nature, and businesses.



Source: Water in Circular Economy and Resilience (WICER)

Why the need of Circular water economy in India?

- Limited water resources.
- Over-extraction of Groundwater
- Dependence on Monsoon
- Uneven distribution of freshwater
- 80% of freshwater available is used in agriculture
- About 72% of wastewater is untreated (NITI Aayog)
- Rapid urbanization and industrial growth



Baseline Water Stress Map of India (Source: IWT 2.0)

Water pathways in achieving Circular economy

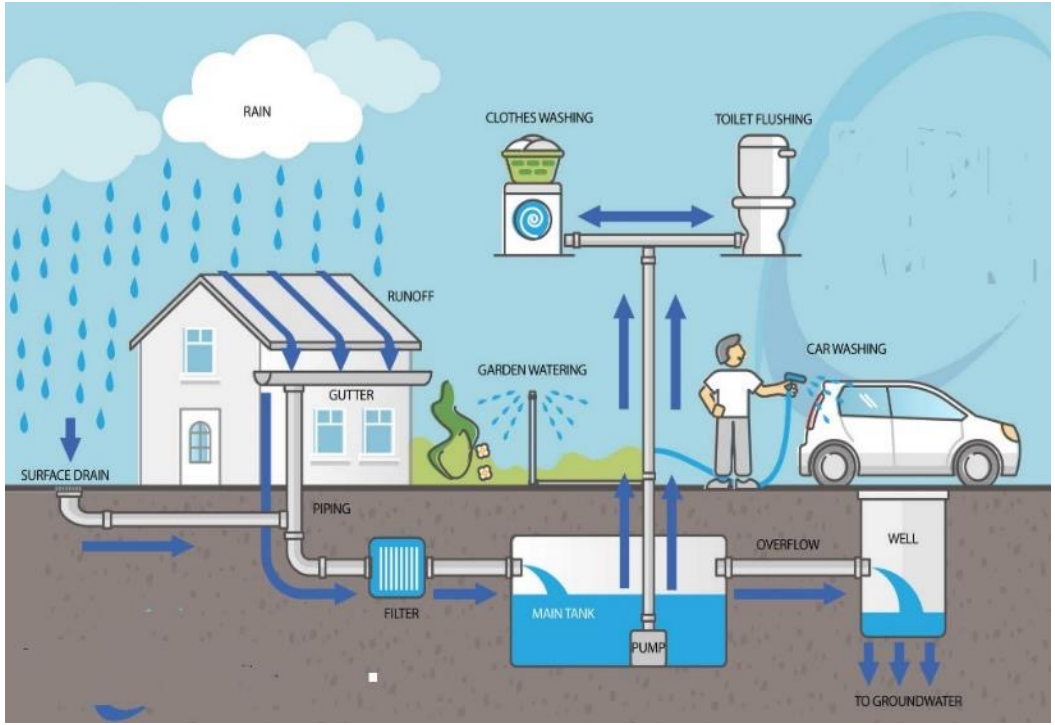
1. Upstream Investment like stormwater regulation, water purification
2. Rainwater harvesting
3. Greywater Recycling for non-potable reuse
4. Greywater for agriculture and aquaculture
5. Reuse for agriculture and aquaculture
6. Reuse water for industry
7. Direct potable reuse
8. Reduction in water consumption

https://www.worldbank.org/en/topic/water/publication/wicer

Circular water Storage

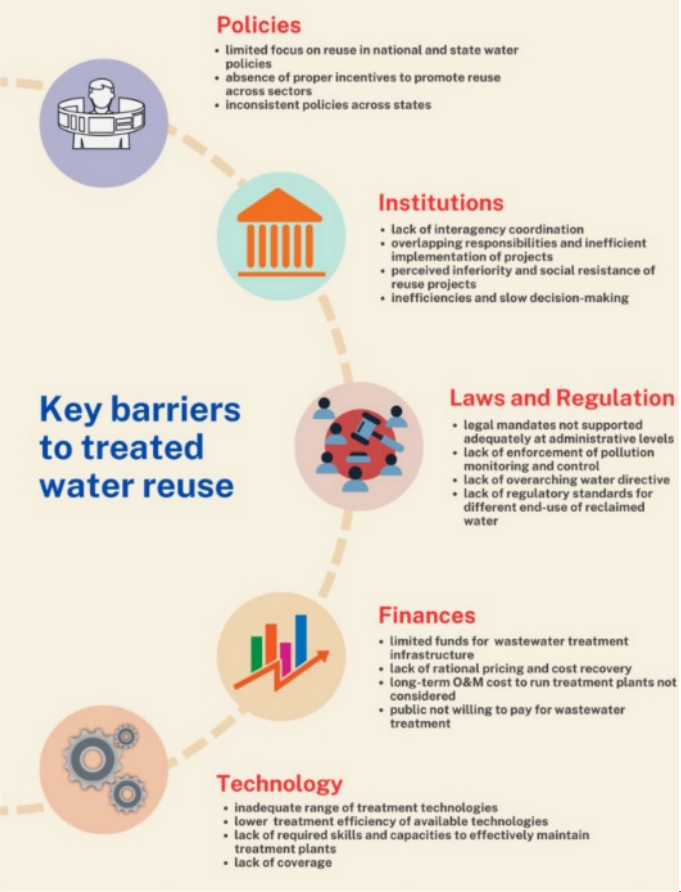
Challenges:

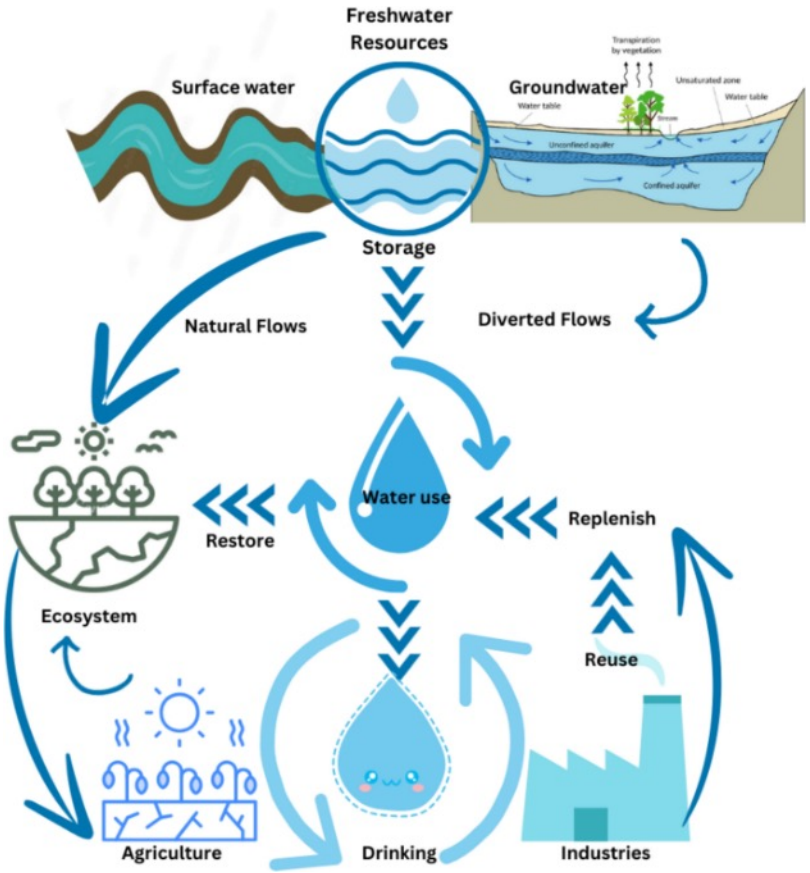
- Inadequate infrastructure and management
- Uneven Monsoon
- Increased evaporation rates
- Loss of traditional water harvesting systems (Khadins, Zabo)
- Limited understanding of circular water practices



Source: https://www.eawater.com/casestudy/circular-economy-of-water/

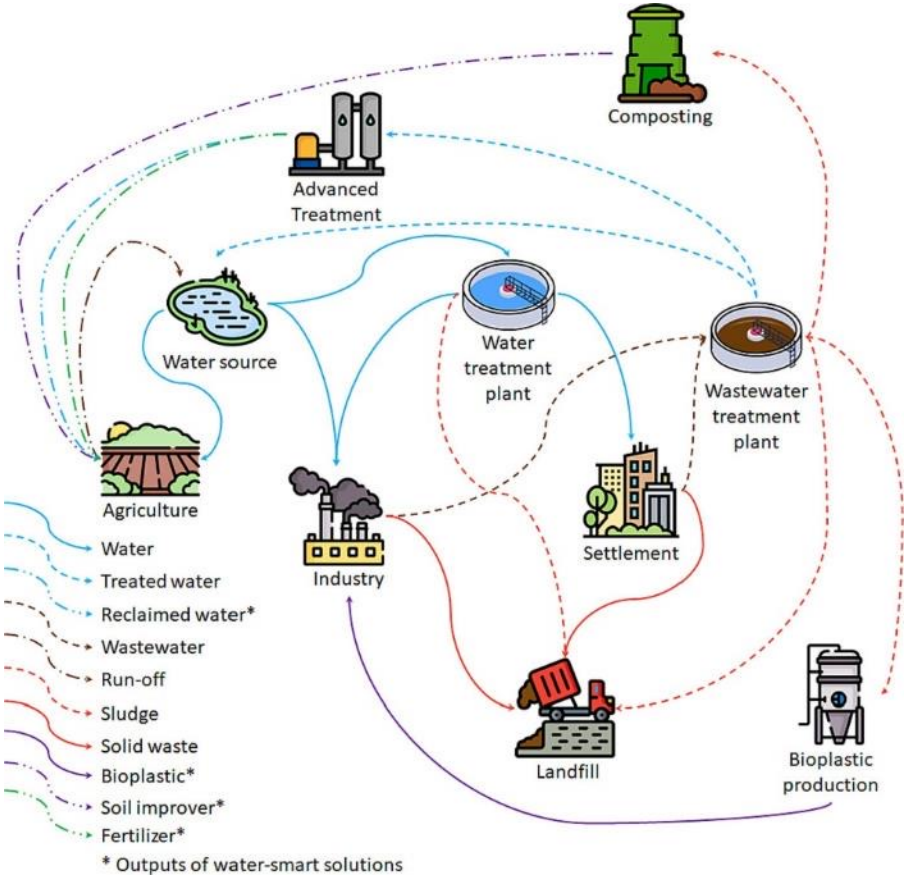
Wastewater in the Circular economy

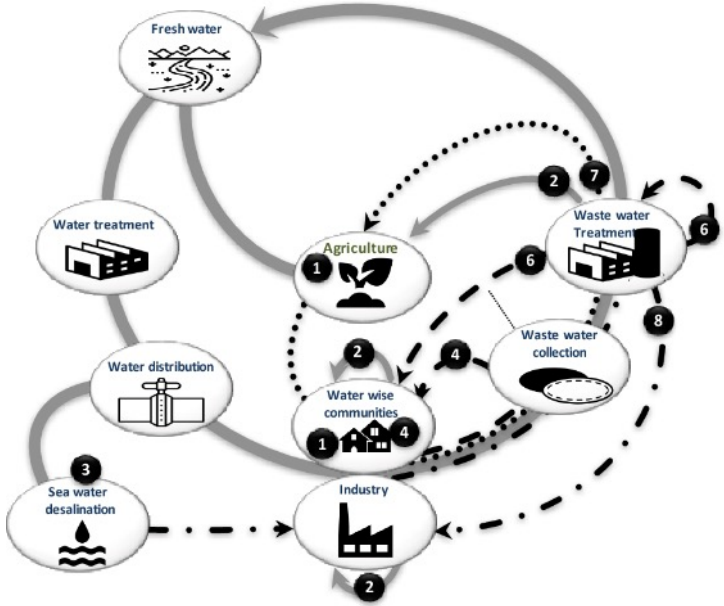




https://link.springer.com/article/10.1007/s42398-024-00321-z

Water Smart solutions for Circular Economy

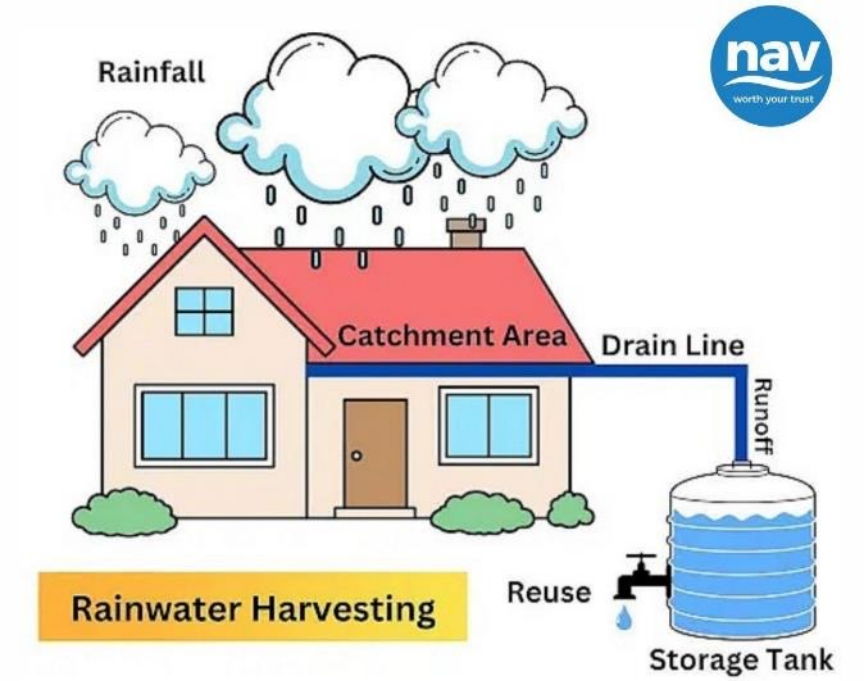




https://api.semanticscholar.org/CorpusID:19143096; https://www.sciencedirect.com/science/article/pii/S0960852422012846#f0005

Case Studies: Rajasthan, India

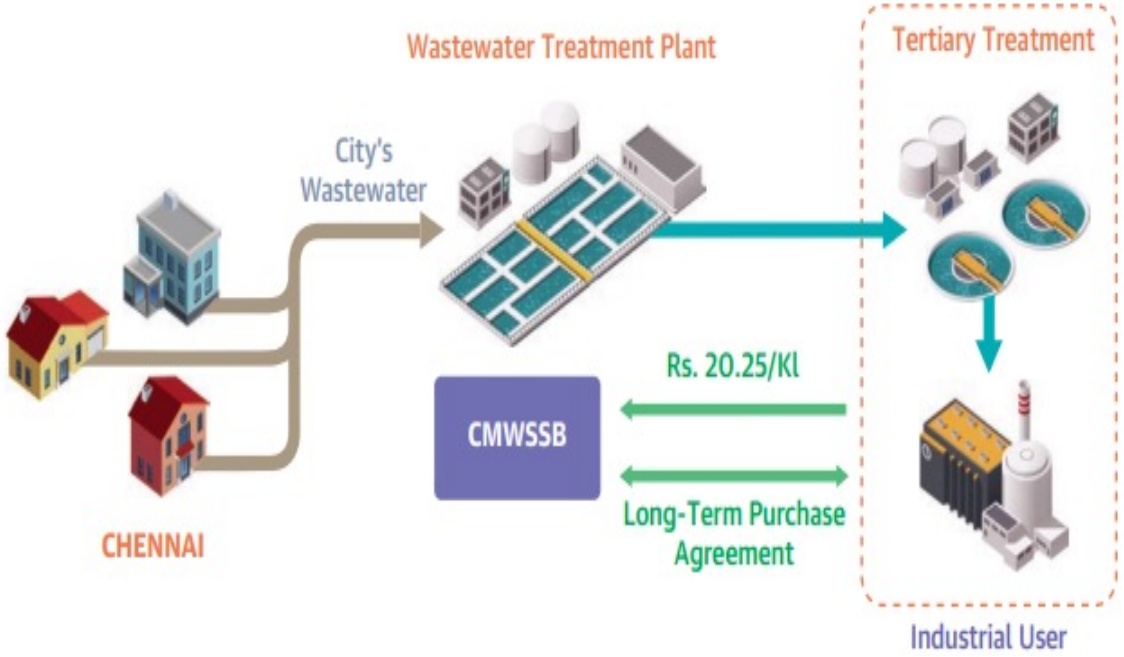
- Rajasthan Government Mandates Rainwater Harvesting For All New Buildings
- All new residential buildings with a footprint of 225 square meters or more, and commercial buildings exceeding 500 square meters, must incorporate rainwater harvesting systems.



Source: www.navwater.com

Case Studies: Chennai, India

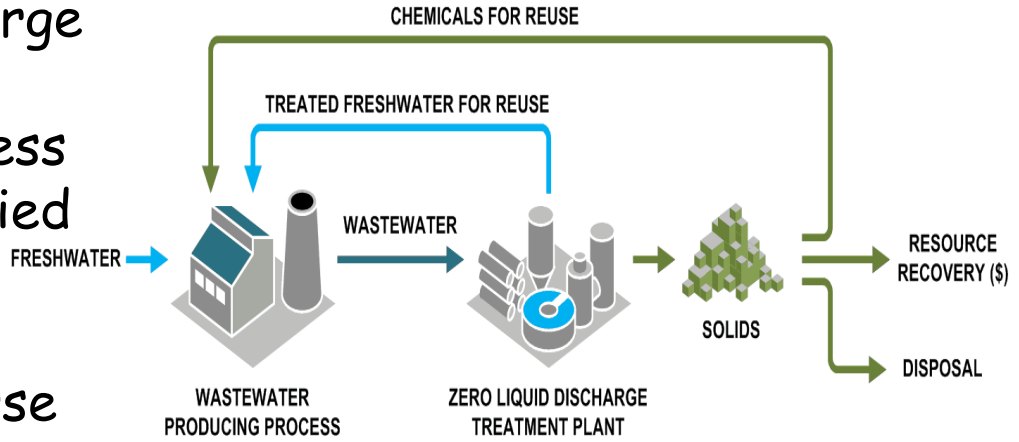
- The Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) sells treated wastewater to industrial users and generate additional revenues, it can cover all operating and maintenance costs.
- The capital investment in the reuse project has been recovered in less than five years.



Source: WICER

Case Studies: Tirupur Textile Industry, India

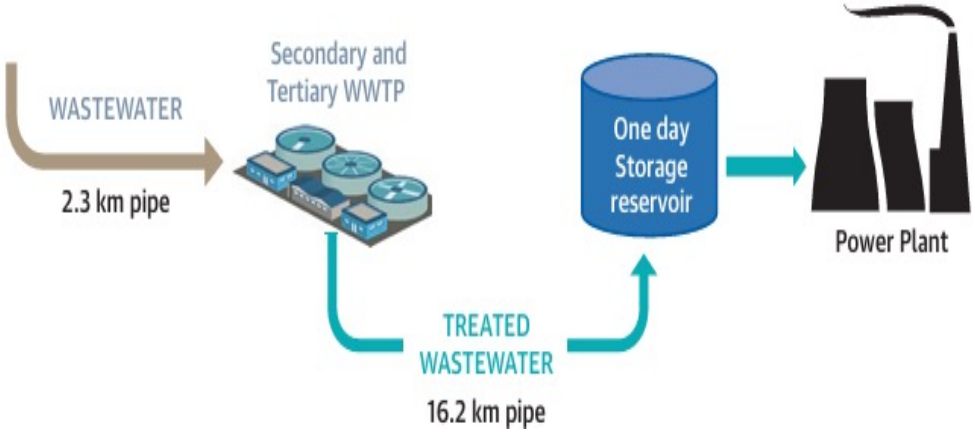
- Tirupur, a town in Southern India implemented Zero-liquid discharge (ZLD) policy in 2011
- ZLD is a water treatment process in which all wastewater is purified and recycled.
- ZLD treatment involves
  1. Biological treatment, reverse osmosis, and crystallizers.
  2. 99% water is recovered
  3. Solid waste and other salts are byproducts.



Source: https://www.saltworkstech.com/

Case Studies: Nagpur, India

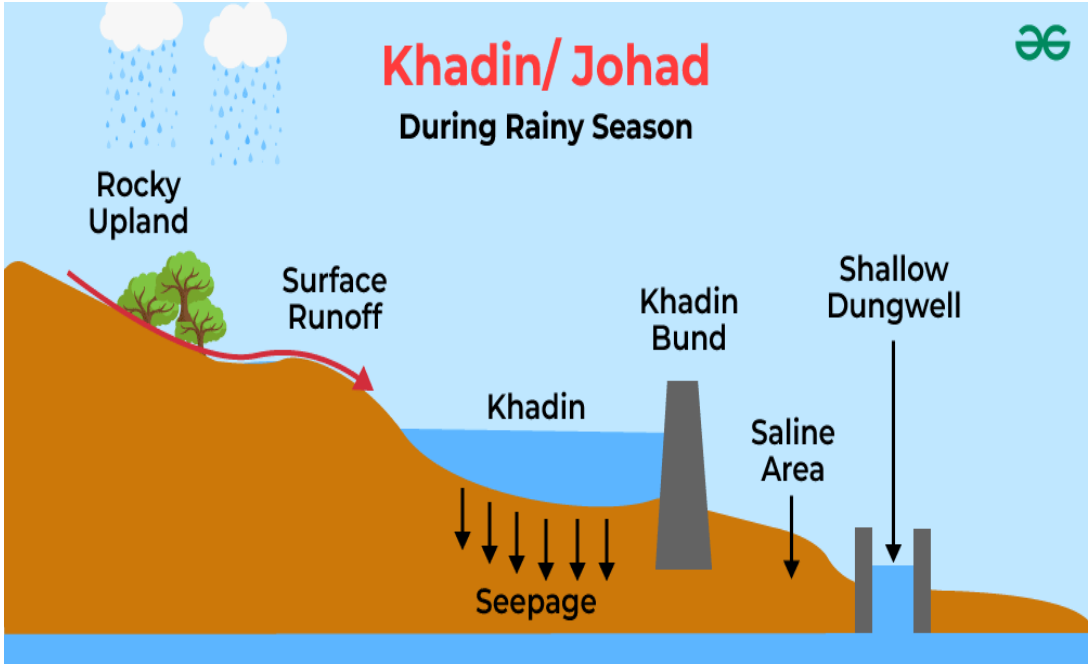
- Nagpur's water reuse project under Build Operate Transfer (BOT), a public-private partnership between Nagpur Municipal Corporation and MahaGenCo.
- NMC agreed to provide the raw wastewater, and MahaGenCo agreed to be in charge of the transportation and treatment needed to reuse the wastewater effluent from the NMC sewerage system.



Source: World Bank

Case Studies: Rajasthan, India

- Tarun Bharat Sangh (TBS), a Rajasthan based Non-Government-Organisation (NGO), has worked towards water conservation by reviving rivers, building rainwater harvesting structures (Johads), protecting water commons.
- Johads are small earthen check dams that capture and conserve rainwater, improving percolation and groundwater recharge.



Source: https://www.geeksforgeeks.org/johads-and-khadins/

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Thank you !

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