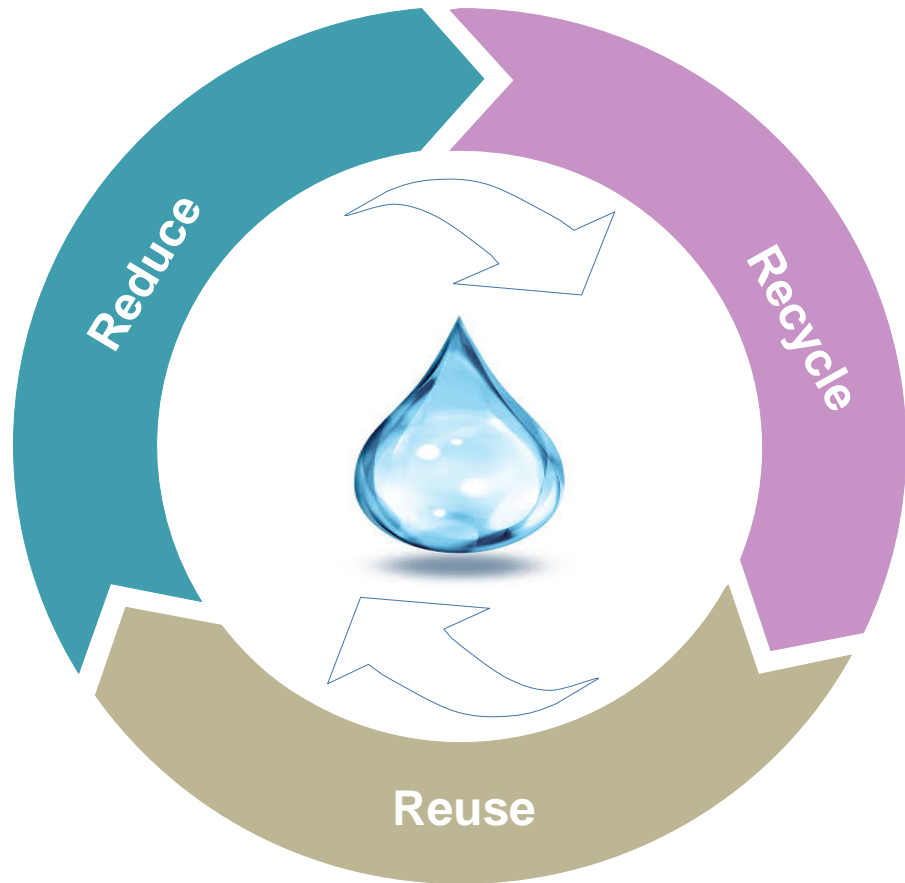


Advancing 3Rs in India and Co-benefits for Safe Drinking Water and Reliable Sanitation

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Sisamau Nala, Kanpur's most polluted and largest open drain, flowing into Ganga.



The scenario

1545 cubic
meter

Per capita water availability has gone down from 1861 cubic meter in 2001 to 1545 cubic meter in 2011

91%

Of 302 River stretches polluted with high health impacts

55 %

Households have no or open drains

20 %

Groundwater blocks critical or overexploited

>50%

Of the urban households are connected to on-site sanitation systems

37000
MLD

of Sewage flows untreated

23%

Industries do not get water easily or at high costs

816

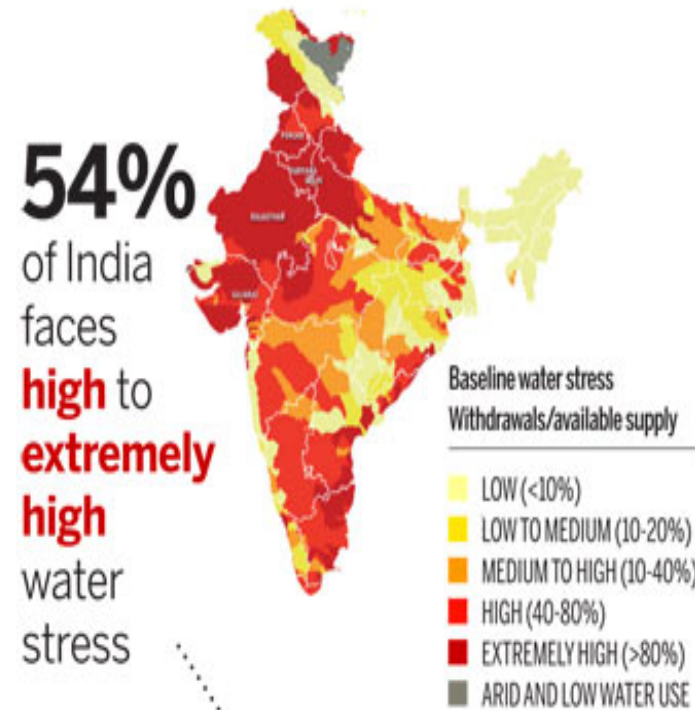
Wastewater treatment plants across the country

80%

of water supplied flows back as wastewater into the ecosystem

Urban water scarcity is growing...

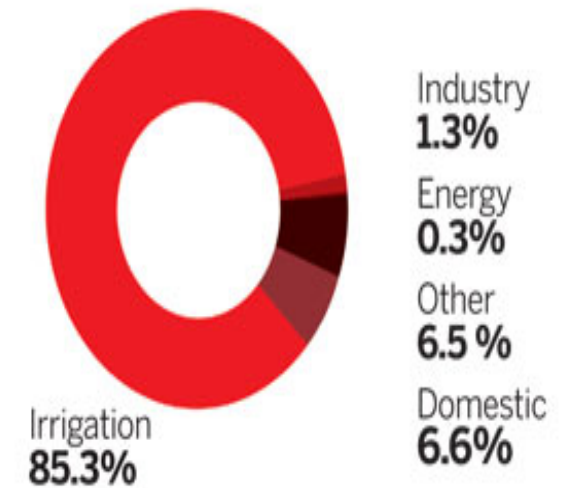
- Decreasing per-capita water availability and increasing pollution of fresh-water resources are huge challenges today.
- In urban areas especially, water resources are under significant pressure due to high water-demand patterns.
- The situation is worsening with rising demand due to increasing urbanization.
- With growing demands for water for irrigation and industry, urban water scarcity is a problem on hand .



Source: World Resources Institute

WATER

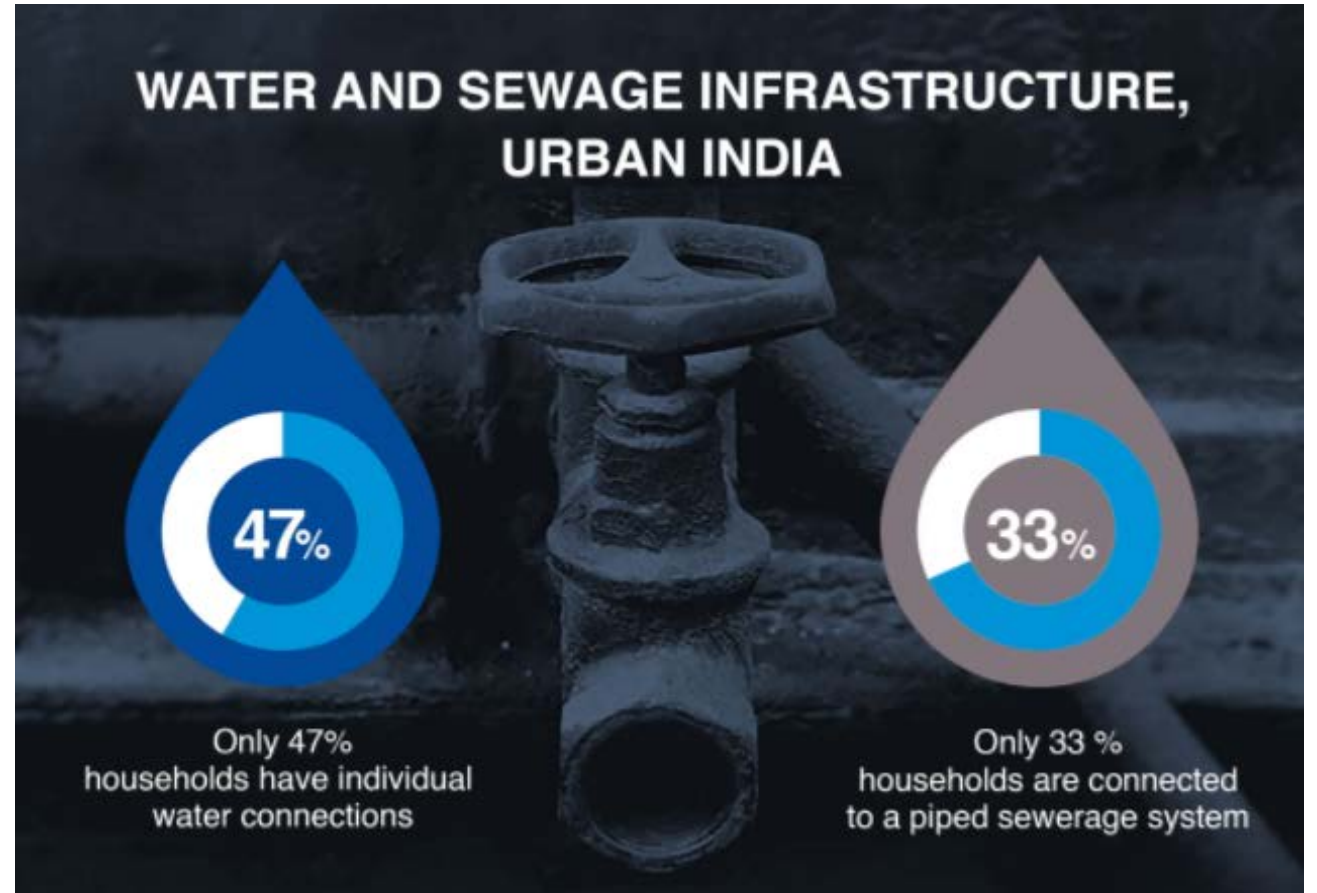
The Water Consumer



Source: Central Water Commission

Untreated wastewater threatens both ground water and surface water systems

- Almost 80 percent of water supply to municipalities returns to the ecosystem as untreated wastewater, with its environmental and health hazards.
- A Large proportion of population depends on groundwater for drinking purposes
- With inadequate/improper sanitation infrastructure and services, both groundwater and surface water sources face quality threat.



Future water scenario

- Increase in water demand will require more investment in infrastructure
- With sewerage systems planned in most cities, water will have to be provided at 135 lpcd, or at least 100 lpcd.
- Pollution has rendered water sources closer to urban centres unusable or has reduced their yield
- Cities will go more distances to obtain water – adding to capital cost of infrastructure, and power cost for operations

National per capita annual availability of water:

- 1816 cu m in 2001
- 1544 cu m in 2011
- 1140 cu m in 2050 – estimated

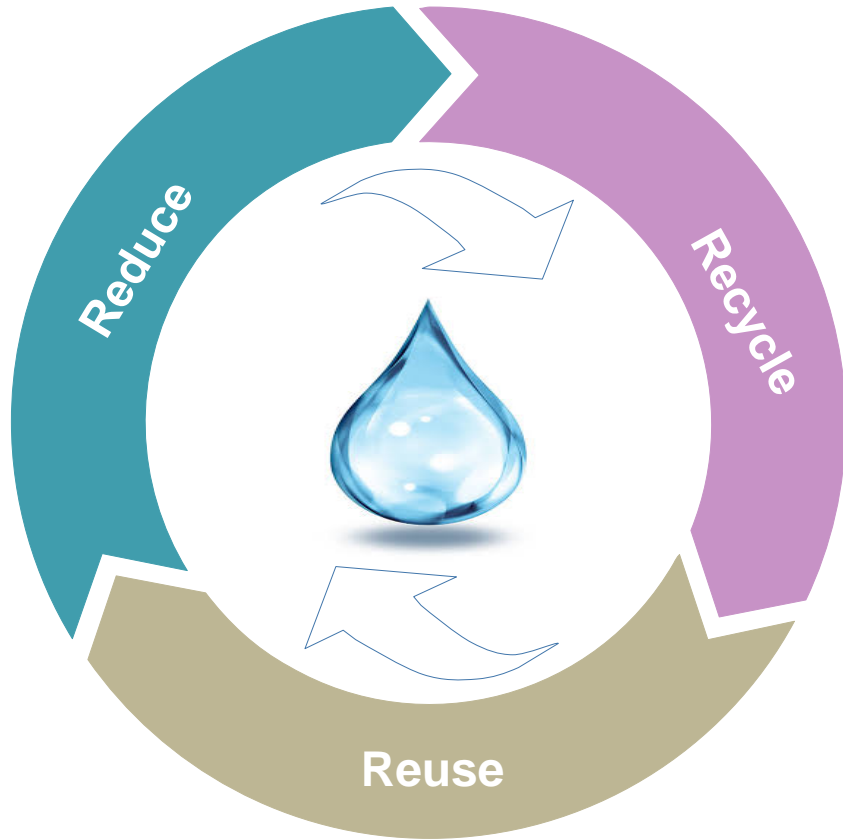
Source: Central Water Commission

Availability of less than 1000 cu m per capita is considered as scarcity conditions.

At this point, India is still to recognize and adapt to the opportunity of circular water economy.

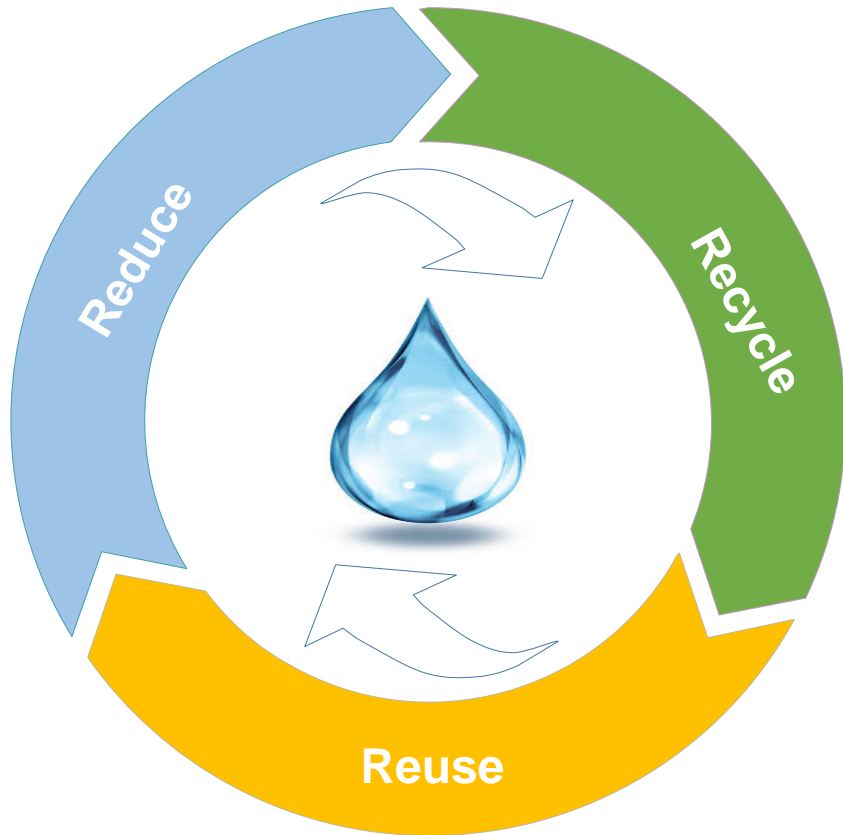
- However, with rising water scarcity and increasing water prices, wastewater treatment has the potential to mature as a profitable intervention as alternate water resource.
- Instead of treating it as a waste to be disposed of, wastewater could be considered a resource for recycle and reuse- essentially replace.
- A shift from **“use and discharge”** to a **“use, treat, and reuse”** approach is required.

3Rs in the context of Water



- **Reduce**: Reduce water leakages, wastage and Reduce pollution and contamination of water resources
- **Reuse**: Reuse treated water appropriately and other byproducts for energy and other resources
- **Recycle**: Treat and Recycle Wastewater generated from various sources

3Rs in the context of Water and Sanitation



- **Reduce**: Reduce pollution and contamination of water resources by the **open/dumping discharge of sewage and septage**
- **Reuse**: Reuse wastewater in the decreasing order of quality requirements (more than single use before treatment intervention)
- **Recycle**: Appropriate treatment of wastewater and recycling to reduce demand on fresh water.

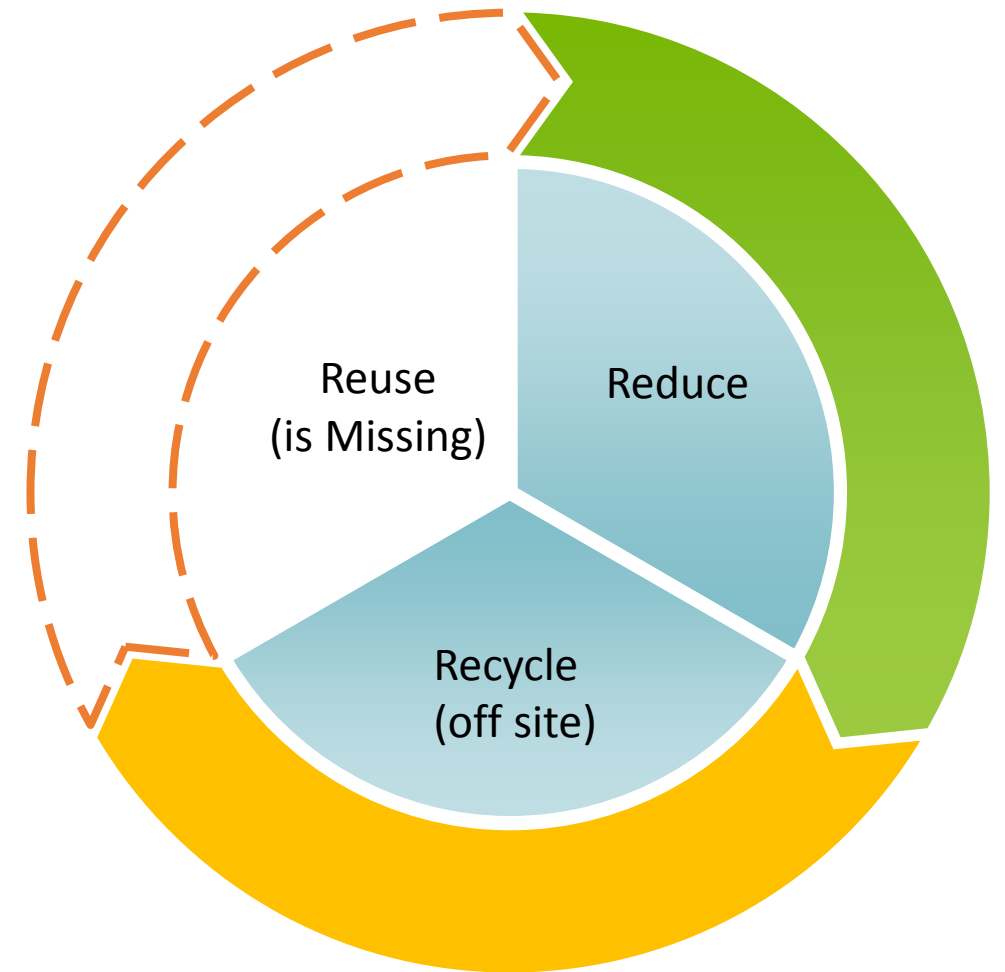
Currently most wastewater treatment systems designed for treatment only, i.e. recycle only.

In the entire cycle of reduce, recycle and re-use, reuse is Missing. Not much effort made on *reuse*

So while we treat, we don't treat with a purpose to recycle it...Locally

Experience says end-use should determine the choice of technology for recycling

A comprehensive 3R approach to water and wastewater will have to change from treatment –discharge to **reuse-treat-recycle** management.



Steps taken for promotion of 3Rs in water and sanitation

- Policy guidance (under Tariff Policy Clause 6.2 (5), Ministry of Power) mandating use of secondary or tertiary treated water by power plants within the radius of 50 Kms of Sewage treatment plants
- Policy guidance of recycled water usage within urban space
- A national mission to increase water use efficiency in all sectors
- Policy on recycling wastewater byproducts.

Chennai Metropolitan Water Supply and Sewerage Board: Tertiary Treatment Reverse Osmosis (TTRO) Plant: A Successful example

- CMWSSB constructed a Tertiary Treatment Reverse Osmosis (TTRO) plant of 45 MLD capacity at Kodungaiyur.
- Treated water is being supplied to the industries, power plants and institutions in Manali- Minjur Corridor, Manali- Ennore Corridor in North Chennai through a conveying main of length 28.5 kms.
- The size of the conveying main varies from 300 mm to 800 mm.
- The project was developed under the scheme of Tamil Nadu Sustainable Urban Development Project (TNSUDP) with financial assistance from World Bank.

Nagpur 200 MLD STP Treatment and Reuse on PPP basis

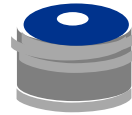
Objective:

- Providing Sewage Treatment for 200 MLD and possible reuse by potential Customers in Nagpur

Project details:

- Client: Nagpur Municipal Corporation
- Project Cost: USD 42 Mn
- Revenue: Annuity Payment by Client
- Option with resale with revenue sharing mechanism
- Concession Period: 32 years.
- Option to sale the treated water with revenue share with Client
- 100% capital investment by Operator
- Annuity based payment post construction period

In order to attain a truly circular economy in water and wastewater we will need to do the following...



01

Recognize wastewater as a valuable resource

Need for more supporting policies and regulations to promote use of wastewater for industrial purposes

02

Financing mechanisms such as VGF and initial capital push from government could further attract investment from private sector

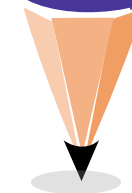
03

Decentralized WWT systems and small scale STPs should be seen as viable solutions & promote local reuse & recycling

04

A multi-stakeholder approach required to integrate water and wastewater involving IEC, and community approaches

05



Thanks for your time