Why is Clean Drinking Water still a Problem in India?

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Water is an essential resource for human life and development. It is scarce in nature. Only 1% of the world's water resource is fresh water. The way we use and distribute these resources has changed drastically in the last century. According to the UN, the estimated population of India by 2050 will be 1.66 billion and the availability of total drinking water in India is 1122 cubic meters. Hence, we need to rethink, the way we use our available water resources and make sure that there is enough for everyone.

In such situations to safeguard the water and to plan better for the future, as a facilitator or even as a consumer - it is important for all of us to be aware of the existing system of water. This article will focus on two parts: existing water infrastructure and politics.

Water infrastructure can be defined as the systems, structures, and mechanisms that supply water to beneficiaries. Water politics can be defined as the policies, laws, and regulations, tarrif that govern how a country or region manages its water. This system is a branch of social and political science dealing with the management as well as the distribution of water resources, like - surface water and groundwater. Water politics can be a source of conflict when people have different views about the use and ownership of water.

Indian water resources are highly dependent on seasonal high-intensity rains. The management of these resources includes - storage, segregation, filtration, and distribution. According to the newer system, distribution takes place mainly through pipelines. These use to supply water to different parts of the settlements. According to the National Institution for Transforming India (NITI aayog) August 2019, there is an uneven distribution of piped water. The report further mentioned that 82% of rural households does not have piped water supply and the demand for water will increase in the near future (see Image 1).

The following can be considered as a few reasons behind unequal distribution of water - Concentration of high density areas, poor and damaged infrastructure, abandoning the existing local systems, Inadequate funding for newer systems, lack of awareness and use of existing government schemes, loss of data or no data to plan for the future, implausible aspirations of beneficiaries, etc.

All the above-mentioned factors in the supply chain of water impact its pricing. Many Indian states have a bare minimum monthly volumetric charge, which is a blanket price policy for water in that respective state.This pricing is dependent upon factors like - water connection, meter

charge[1], filtration charge, pipeline cost, labor cost, etc.These charges are restricted to only piped water provided by local governing bodies. But the major setback of this system is, that it overlooks the consumption pattern behind each delivery outlet.

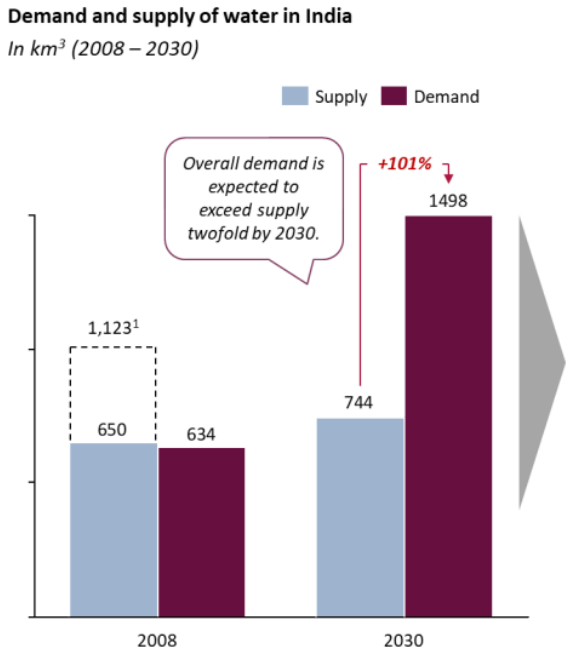


Image 1 : Demand and supply of water in India[2]

These patterns in the system overlap each other and cause a disparity in the delivery of water between neighborhoods of the same city. This phenomenon is often practiced via the time-bound availability of water. In such cases, people have to rely on secondary sources of water. These secondary sources are often categorized as groundwater sources, packaged drinking water, rainwater harvesting, or private parties providing tanker water. These all are inadequate in nature.

Groundwater as a resource is not available in every part of the state. The availability of adequate supply in this system is highly dependent upon catchment areas, conditions, and the importance given to them in the planning practice(see Image 2).

Packaged drinking water in India is 300 times costlier than piped water and 100% costlier than any available open public water resource. This makes it an unaffordable option for consumption.[3]

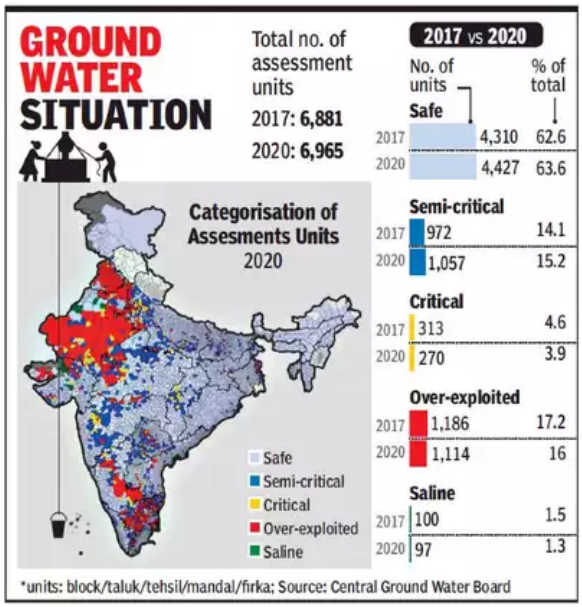


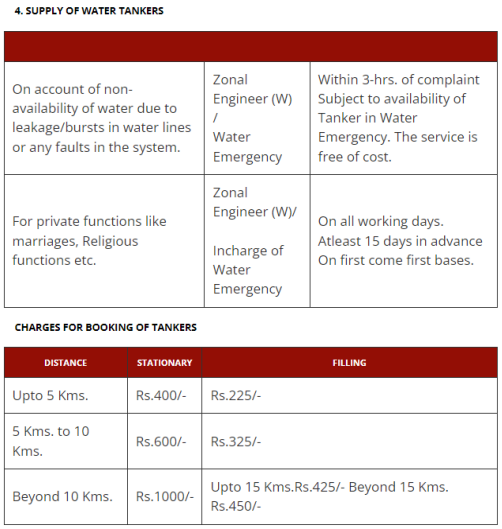
Image 2 : Condition of groundwater in India 2017- 2020 [4]

Rainwater harvesting is one of the oldest practice in India, 65% of the land mass has these systems in place but, most of them are ignored and abandoned[5]. These areas have the lowest density compared to urban

[1] Dependency of water tariff _ https://web.mit.edu/urbanupgrading/waterandsanitation/funding/estab-price-policy.html
[2] Demand and supply of water in India _Niti aayog 2019
[3] Rates of water supply_ https://mumbai.citizenmatters.in/how-much-do-mumbaikars-pay-for-water-28014#:~:text=The%20official%20charge%20for%20residences,pay%20Rs%204.44%20per%20kilolitre.
[4] Condition of groundwater in India 2017- 2020 https://timesofindia.indiatimes.com/india/1/6th-of-indias-ground-water-reserves-over-exploited-study/articleshow/84308738.cms
[5]Water harvesting systems _ https://www.vardhmanenvirotech.com/blog/rainwater-harvesting-in-ancient-india/

land mass. Due to water scarcity, most state governments adopted rainwater harvesting policies in the newer development control regulations. Maharashtra government post 2007 added this policy for the plot above 300 sqm should consist of a rainwater harvesting unit[6]. But these policies are applicable to only 35% of the urban land mass of India. So, in spite of being good practice, it is not applicable for all in both cases.

In this last segment of secondary water supply if we study tanker water - it is both authorised and unauthorised in nature. The example of an authorised tanker supply (see Image 3) depends up on the distance



4. SUPPLY OF WATER TANKERS

On account of non-availability of water due to leakage/bursts in water lines or any faults in the system.	Zonal Engineer (W) / Water Emergency	Within 3-hrs. of complaint Subject to availability of Tanker in Water Emergency. The service is free of cost.
For private functions like marriages, Religious functions etc.	Zonal Engineer (W)/ Incharge of Water Emergency	On all working days. Atleast 15 days in advance On first come first bases.

CHARGES FOR BOOKING OF TANKERS

DISTANCE	STATIONARY	FILLING
Upto 5 Kms.	Rs.400/-	Rs.225/-
5 Kms. to 10 Kms.	Rs.600/-	Rs.325/-
Beyond 10 Kms.	Rs.1000/-	Upto 15 Kms.Rs.425/- Beyond 15 Kms. Rs.450/-

Image 3 : State governement regulated tanker water supply[7]

allotted, jurisdiction boundary and time factor,etc. This may or may not consider the quality of water.

A comparison between government approved piped water and unauthorized tanker water systems, with respect to expenditure shows the price of tanker water is skyrocketing. This system of tanker water is mostly opted by the settlements with poor or no infrastructure, one with a low quality of livability index and are from high density areas.

Consumer	Slab / per capita consumption	Rate per 1000 litres
Residences – Piped supply	150 lpcd	Rs 5.94
Residences – Piped supply	150-200 lpcd	Rs 11.88
Residences – Piped supply	200-250 lpcd	Rs 17.82
Residences – Piped supply	250+ lpcd	Rs 23.76
Slums – Piped supply	45 lpcd	Rs 4.44
Slums – Groundwater supply by	45 lpcd	Rs 4.93
Tanker (private suppliers)	–	Rs 200-700
Informal sources, like neighbours	–	Rs 42 avg
Non-authorised informal sources	–	Rs 95 avg
Residences in buildings without Occupancy Certificate	Same as regular residences	Double the standard residence rates

Image 4 : State governement regulated tanker water supply[8]:

These all examples together depict the inadequacy of water supply, continuously increasing demand, inequality when it comes to types of water tariff, and the disparity of the charge applicable against the income of an individual.

This reminds me the quote of Adam Smith -

"How is it that water which is so useful that life is impossible without it, has such a low price; while diamonds, which are quite unnecessary, have such a high price."

[6] DCR and rain water harvesting policy_https://indianexpress.com/article/cities/mumbai/3000-mumbai-buildings-have-built-rain-water-harvesting-units-in-14-years-bmc-7453312/

[7] State governement regulated tanker water supply_http://delhijalboard.nic.in/content/water-0

[8] State governement regulated tanker water supply_https://mumbai.citizenmatters.in/how-much-do-mumbaikars-pay-for-water-28014#:~:text=The%20official%20charge%20for%20residences,pay%20Rs%204.44%20per%20kilolitre.

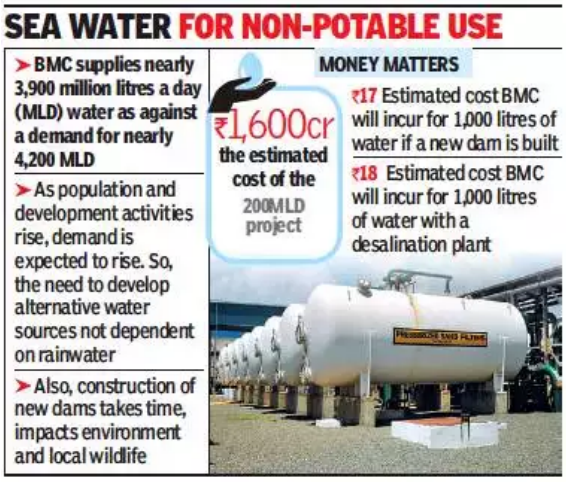


Image 5 : State governement initiative[9]

There are other ways in which citizens are trying to find the balance within the system, by adapting different solutions like - acceptance of water crisis on every possible governance level, especially in constitution[10], water resilient policies been incorporated in new development regulations, few local government bodies are trying desalination method to meet the water demand(See image 5). To mitigate this issue, the central government of India also launched the *Jal Jeevan* mission and the *Nal se Jal* scheme. The performance of these schemes are yet to be scrutinized but, it is high time for us human to get sensitized toward the issue of water. In the end, one question still remains - Why is Clean Drinking Water still a Problem in India?

[9] State governement_initiative_https://timesofindia.indiatimes.com/city/mumbai/mumbai-bmc-israeli-co-ink-pact-for-states-first-desalination-plant/articleshow/83937808.cms

[10] Right to water : https://nhrc.nic.in/sites/default/files/Right%20to%20water.pdf