

4. Drinking Water: Quality & Challenges

Prelims Level: Pollution

Mains: GS-III Environmental Pollution

Why in News?

- A study by the Union Consumer Affairs Ministry has found samples of tap water collected from Mumbai, compliant with the Indian standards for drinking water. However, other metro cities of Delhi, Kolkata and Chennai failed in almost 10 out of 11 quality parameters tested by the Bureau of Indian Standards (BIS).

Findings of the Study:

- Mumbai tops the ranking, while Delhi is at the bottom.
- Samples drawn from 17 other state capitals were not as per the prescribed specifications for drinking water.
- In the next phase, samples from the capital cities of north-eastern states and from 100 smart cities will be tested and their results are expected by January 15, 2020.

India's Drinking Water Crisis

- "Water is life's matter and matrix, mother and medium"
- With a diverse population that is three times the size of the United States but one-third the physical size, India has the second largest population in the world. Although India has made improvements over the past decades to both the availability and quality of municipal drinking water systems, its large population has stressed that the quality part is still below the standards.
- The rapid growth of population in India's urban areas, is making the problem of availability worse. And also, India's water crisis is often attributed to lack of government planning, increased corporate privatization and contamination due to industrial and human wastes.
- A NITI-Aayog report released last year predicts Day Zero for 21 Indian cities by next year.
- The available data points that, India is still water surplus and receives enough annual rainfall to meet the need of over one billion plus people. According to the Central Water Commission, India needs a maximum of 3,000 billion cubic metres of water a year while it receives 4,000 billion cubic metres of rain.

Why a Water-Surplus Country is facing water Crisis Today?

- ✓ Over-exploitation of groundwater
- ✓ Wastage of water
- ✓ Unequal distribution and availability
- ✓ Loss of wetlands and water bodies
- ✓ Fewer upgradation of laws

The Case of Israel

- Israel, a country that is located in desert and has learnt to deal with water crisis situation.
- Israel treats almost 100 per cent of its used water and recycles 94 per cent of it back to households. More than half of irrigation in Israel is done using reused water

Over-exploitation of Groundwater

- India is the biggest user of groundwater.
- Groundwater meets more than half of total requirement of clean water in the country.
- In 2015, the standing committee on water resources found that groundwater forms the largest share of India's agriculture and drinking water supply.
- Overall, 50 per cent of urban water requirement and 85 per cent of rural domestic water need are fulfilled by groundwater.
- The report prepared under the ministry of water resources cited rising population, rapid urbanisation, industrialisation and inadequate rainfall as reasons for sharp decline in groundwater volume in the country.

Wastage of Water

- The problem in India is that it captures only eight per cent of its annual rainfall - among the lowest in the world.
- The traditional modes of water capturing in ponds have been lost to the demands of rising population and liberal implementation of town planning rules.
- India has been also poor in treatment and re-use of household wastewater. About 80 per cent of the water reaching households in India are drained out as waste flow through sewage to pollute other water bodies including rivers and land.

Unequal Distribution and Availability:

- According to the Composite Water Management Index of the NITI Aayog, 75 per cent of households do not have drinking water on premise and about 84 per cent rural households do not have piped water access.
- Water is not properly distributed where it is supplied through pipes.
- Mega cities like Delhi and Mumbai get more than the standard municipal water norm of 150 litres per capita per day (LPCD) while others get 40-50 LPCD.
- The World Health Organisation prescribes 25 litres of water for one person a day to meet all basic hygiene and food needs.
- Extra available water, according to the WHO estimates, is used for non-potable purposes like household cleaning.
- It will have another challenge, however, to plug leakage of piped water in urban areas. It is estimated that around 40 per cent of piped water in India is lost to leakage.

Loss of Wetlands and Water Bodies

- Many cities and villages in the country had lost their wetlands, water bodies and even rivers to encroachment to meet the needs of rising population.
- Chennai that is facing acute water shortage, had nearly two dozen water bodies and wetlands but most of them are out of use today. A recent assessment found that only nine of them could be reclaimed as water bodies.
- A survey by the Wildlife Institute of India reveals that the country has lost 70-80 per cent of fresh water marshes and lakes in the Gangetic flood plains, the biggest river plain in the country. The percentage of districts with overexploited state of groundwater level increased from 3 in 1995 to 15 in 2011, worsening the water security of the country.

Fewer Upgradation of Laws

- The Easement Act of 1882 that gives every landowner the right to collect and dispose groundwater and surface water within his/her own limits is still in operation.
- This law makes regulation of water usage by a person on his/her land, leading to commercial exploitation of water sources.
- Further, water falls under state list of the Schedule VII Constitution meaning only the state governments can frame a regulatory law.
- In 2011, the central government published a Model Bill for ground water management for the states.

- But not all the states have passed a matching legislation which endorses the doctrine that resources meant for public use cannot be converted into private ownership.

Chlorination

- Water chlorination is the process of adding chlorine or chlorine compounds such as sodium hypochlorite to water. This method is used to kill certain bacteria and other microbes in tap water as chlorine is highly toxic.

The Benefits:

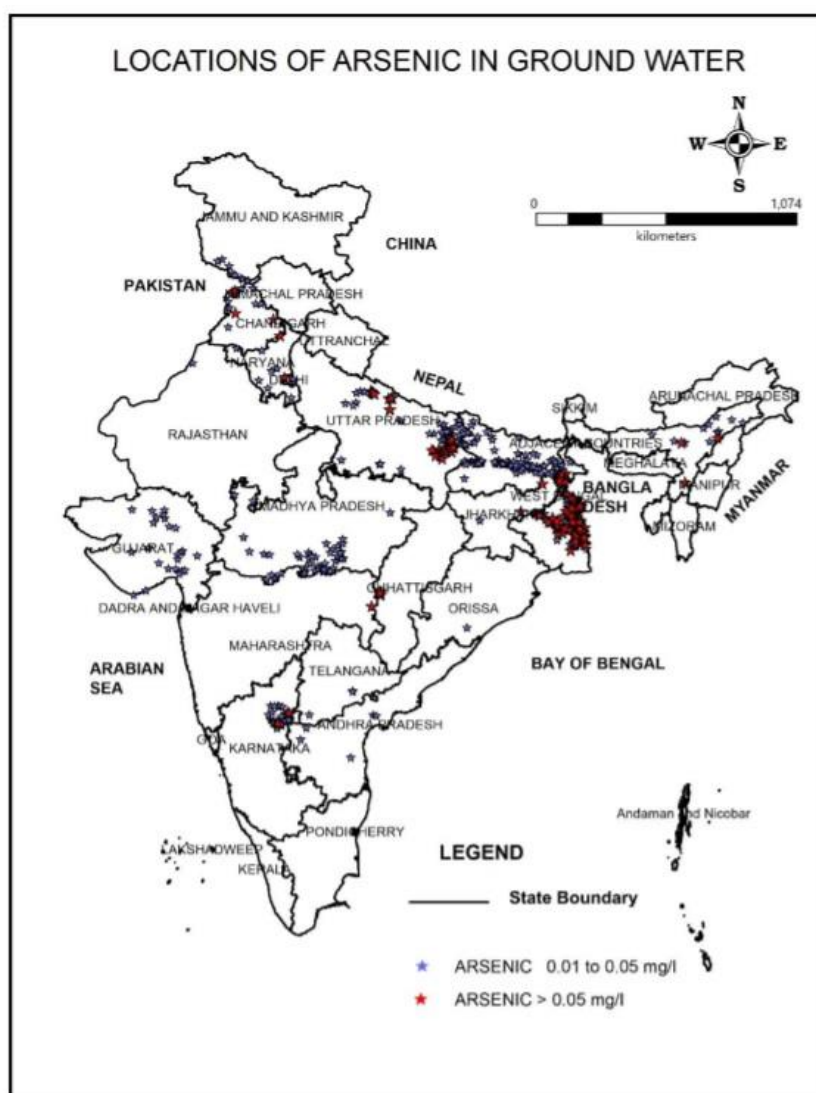
- Proven reduction of most bacteria and viruses in water
- Ease-of-use and acceptability
- Proven reduction of disease incidence – Diarrhoea and Cholera
- Scalability and low cost

The Drawbacks:

- Relatively low protection against protozoans
- Does not solve the problem of turbidity (dissolved contaminants)
- Taste and odour may change
- Potential long-term effects of chlorination by-products
- ✓ Therefore, the method of chlorination cannot be used as an one-stop solution to treating the piped municipal water supply.

ARSENIC IN GROUND WATER IN INDIA

- Arsenic is a naturally occurring trace element found in rocks, soils and the water in contact with them.
- Arsenic has been recognized as a toxic element and is considered a human health hazard.
- Arsenic contamination in ground water has been found in the states of Assam, Bihar, Chhattisgarh, Haryana, Jharkhand, Karnataka, Punjab, Uttar Pradesh, West Bengal.
- The occurrence of Arsenic in the states of Bihar, West Bengal and Uttar Pradesh is in alluvial formations but in the state of Chhattisgarh, it is in the volcanic rocks exclusively confined to an ancient rift zone.
- The permissible limit of Arsenic in ground water according to BIS is 0.01 mg/ L.



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- Jal Shakti ministry mandated to deal with water issues including drinking water availability with a holistic and integrated approach. It has already set an ambitious task to provide piped water connections to every household in India by 2024.
 - As Sustainable Development Goals -provides, Goal 6 for clean water and sanitation for ensuring their availability and sustainable management, a country like India will be highly productive if all its population have access to clean drinking water, and improved sanitation, and adopts a scientific approach to solve its problems.

