Drinking-Water: Quality & Challenges

Rajya Sabha TV programs like 'The Big Picture', 'In Depth' and 'India's World' are informative programs that are important for UPSC preparation. In this article, you can read about the discussions held in the 'Big Picture' episode on "Drinking Water: Quality & Challenges" for the IAS exam.

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What's the Issue?

- Metro cities of Delhi, Kolkata and Chennai failed in almost 10 out of 11 quality parameters tested by the **Bureau of Indian Standards (BIS)** which is under the escutcheon of the Consumer Affairs Ministry.
- Mumbai's water quality, however, was compliant with the Indian standards for drinking water.
- Samples drawn from 17 other state capitals were not as per the prescribed specifications for drinking water.
- During the third phase of the study, samples from the capital cities of northeastern states and from 100 smart cities will be tested and their results are expected by January 15, 2020.
- India ranks 120th amongst 122 countries as per the **Global Water Quality Index.**

Problem with Delhi Water:

- Raw water quality is very poor in delhi.
- Chlorination is the most common treatment done. It is, however, insufficient to treat the dissolved solids, alkalinity and other toxic metals present in the water as a result of the industrial affluents.
- The pipelines carrying water are old and sometimes damaged causing leakages. This causes the water quality to differ on the consumer's side from that of the distributor's side.
- The pipes, being expensive, aren't replaced or even repaired on a regular basis.
- Surface water and groundwater is mixed in most of the societies.
    - Bombay water is good particularly because of this reason as it is rainfall water, which is relatively pure compared to other sources of water and isn't mixed with other sources of water.

Challenges Faced:

- **Chlorination treatment not enough:**
    - Chlorination alone isn't enough to treat water.
    - Chlorination may kill the bacteria, it may however not be useful for treatment of the dissolved solids and toxic metals present in the water.
        - **Chlorination:** Addition of chlorine to drinking water to kill germs. The chlorine acts as a disinfectant. Various procedures are there to maintain safe levels of chlorine in the drinking water.
- **Maintenance of Pipelines:**
    - The pipelines being expensive aren't replaced or even checked on a regular basis.
    - The negative vacuum created in a leaking pipe pulls materials from outside the pipe causing contamination of the water. This causes the water quality to differ from the distribution side to the consumer's side.
    - In most of the places, the sewage line and the water supply pipes are running parallel to each other, creating a potential situation for the break of an epidemic.
- **Boiling of water not enough:**
    - This leaves the consumer with less or no options to treat the water.

    - The boiling of water is sufficient to kill certain types of bacteria but not the other contaminants present.
    - People are then left with no option but to install water filters, which present more problems:
        - A lot of water is wasted during the process of reverse osmosis.
        - The RO Treated water is deficient in minerals and the regular consumption of this water robs the body of calcium from the bones leading to further complications.
    - People also resort to buying bottled water, which are:
        - Expensive
        - A main contribution to plastic pollution.
- **No binding to the BIS standard:**
    - There is no specific binding or commitment to the BIS standard of water quality.
    - All water supply bodies and municipalities must confirm to the BIS standard of water.
- **Quality and Quantity of the water:**
    - The Delhi government is able to supply only 986 million gallons of water in comparison to the actual requirement of 1134 million gallons of water.
    - Various housing societies are mixing ground water along with surface water.
    - The solid waste which is dumped around, toxic industrial waste, and sewage among other factors contribute to **pollution of the groundwater.**
    - Liberal contamination of the water resources due to multiple reasons, such as digging in cities, unhygienic conditions in the treatment plants itself as the workers do not wear masks or gloves.
    - One of the goals of sustainable development is to ensure the supply of safe drinking water by 2030, which seems very difficult to achieve given the current situation.
- **Water is a state subject:**
    - According to the federal structure, the water is a state subject under the VII Schedule of the Indian Constitution.

Impact of the Issue:

- **Potential Epidemics:**70% of the diseases are waterborne, so water quality must be prioritised.
- **Decline in Tourist inflow:** The tourists living in such cities would be affected by the poor quality of air and water. They could view visiting such cities as compromising on their health, thereby resulting in a decline of tourists which would indirectly affect the economy of the city.
- **Plastic pollution:** The bottled water is usually made out of plastic. They are one of the major sources of plastic pollution.
- **Wastage of water: R**everse osmosis also results in wastage of water. This causes a lot of water wastage in order to get one litre of water.
- **Nutrient Depletion:** The water from these purifiers is deprived of metallic alkali ions such as Calcium, and Magnesium.
    - Consumption of the RO filtered water robs the body of the Calcium.

Way Forward:

- **Demarcation of Responsibilities:** The responsibilities should be demarcated and allocated equally amongst the authorities. The state government and the citizens should work together on the issue.
    - The citizens should be sensitized to the issue.
    - The consumers, the service providers and the government should all be equally responsible and aware of their respective responsibilities towards ensuring the availability of clean and potable water.
- **Localization of water supply and treatment:** The long distance supply of water should be restricted and the process should be localized.
    - The water treatment plants should also be localized to minimize the chances of contamination while transporting the treated water.
- **Proper maintenance :** The pipelines should be maintained and taken care of with proper allocation in the budget.

- **Control on Pollution of water:** Measures must be taken for minimizing the mixing of ground and surface water, as the presence of metal like arsenic can be dangerous if present in higher quantities in the water supplied.
    - Monitoring of water quality more frequently and publishing the results to the public. Monitoring of the water refining systems to check their efficiency should also be done regularly.
- Treatment plants have to be upgraded with new technology such as resins and ion exchange to treat the industrial waste effluents and dissolved solids content.
    - **Resins and Ion exchange treatment:** A semisolid substance secreted by plants or produced artificially by combining molecules to form polymers. Used for water treatment in ion exchange systems.There are cationic and anionic resins which help in removal of positively and negatively charged ions. Most commercial resins are made of polystyrene sulfonate.

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