

Nitrogen Contamination in Groundwater

Why in News?

An assessment of India's groundwater by the Central Ground Water Board (CGWB) found that several States are grappling with a serious problem of nitrate contamination.

- **Concerns** - The number of districts with excessive nitrate in their groundwater rose from 359 in 2017 to 440 in 2023.
- Nearly 56% of India's districts having excessive nitrate in ground water, defined as having more than 45 mg/l (milligram per litre).
- **Nitrogen in groundwater** - Although nitrate is the main form in which nitrogen occurs in groundwater, dissolved nitrogen also occurs in the form of
 - Ammonium (NH₄⁺)
 - Ammonia (NH₃)
 - Nitrite (NO₂⁻)
 - Nitrogen (N₂)
 - Nitrous oxide (N₂O)
 - Organic nitrogen.
- **Vulnerable areas** - Rajasthan, Karnataka and Tamil Nadu.
- Maharashtra, Telangana, Andhra Pradesh and Madhya Pradesh also show notable levels of nitrate contamination.
- **Impact human health** - It leads to methemoglobinemia, or a reduced ability of red blood cells to carry oxygen.
- **Impact environment** - Once the nitrates in the groundwater rise to the surface and become part of lakes & ponds, algal blooms emerge.

Other Major chemical contaminants of Groundwater

- **Contaminants** - Arsenic, iron, fluoride and uranium.
- **Fluoride** - It exceeds the permissible limit in Rajasthan, Haryana, Karnataka, Andhra Pradesh and Telangana.
- **Uranium** - It exceeds 100 ppb (parts per billion) in Rajasthan and Punjab.

India's degree of groundwater extraction is 60.4%, or roughly the same as it has been through the years since 2009. About 73% of the blocks are in the 'safe' zone, meaning that they are replenished enough to compensate for water drawn out.

***Piezometers** measure groundwater levels and transmit the information digitally to a centralised location.*

Reference

[The Hindu| Assessment of Groundwater Contamination in India](#)

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