Yamuna's High Ammonia Level

Why in News

High levels of ammonia in Yamuna is resulting in **frequent disruption** to **Delhi's water supply.**

Key Points

- Recently, ammonia levels shot up to **7.3 parts per million** (ppm) at some places.
  - When the concentration rises beyond the Delhi Jal Board's (DJB's) **treatment capacity of 0.9 ppm,** water production has to be stopped or reduced in water treatment plants.
  - As per the **Bureau of Indian Standards** (BIS), the **acceptable maximum limit of ammonia** in **drinking water** is **0.5 ppm.**
- **Causes of Pollution in Yamuna:**
  - **Industrial Pollution:**

    The Yamuna flows into Delhi from Haryana and the state has **industrial units in Sonipat** (on the banks of Yamuna). Ammonia is used as an industrial chemical in the production of fertilisers, **plastics and dyes.**
  - **Mixing of drains:**

    Mixing of two drains carrying drinking water and sewage or industrial waste, or both, in Sonipat. The two drains often **mix due to overflow or damage to the wall** that separates them.
- **Effects of Rising Ammonia:**
  - Ammonia reduces the amount of oxygen in water as it is **transformed to oxidised forms of nitrogen.** Hence, it also increases **Biochemical oxygen demand** (BOD).

    Water pollution by organic wastes is measured in terms of BOD.
  - If the concentration of ammonia in water is **above 1 ppm,** it is **toxic to fishes.**
  - In **humans,** long term ingestion of water having ammonia levels of **1 ppm or above may cause damage to internal organs.**

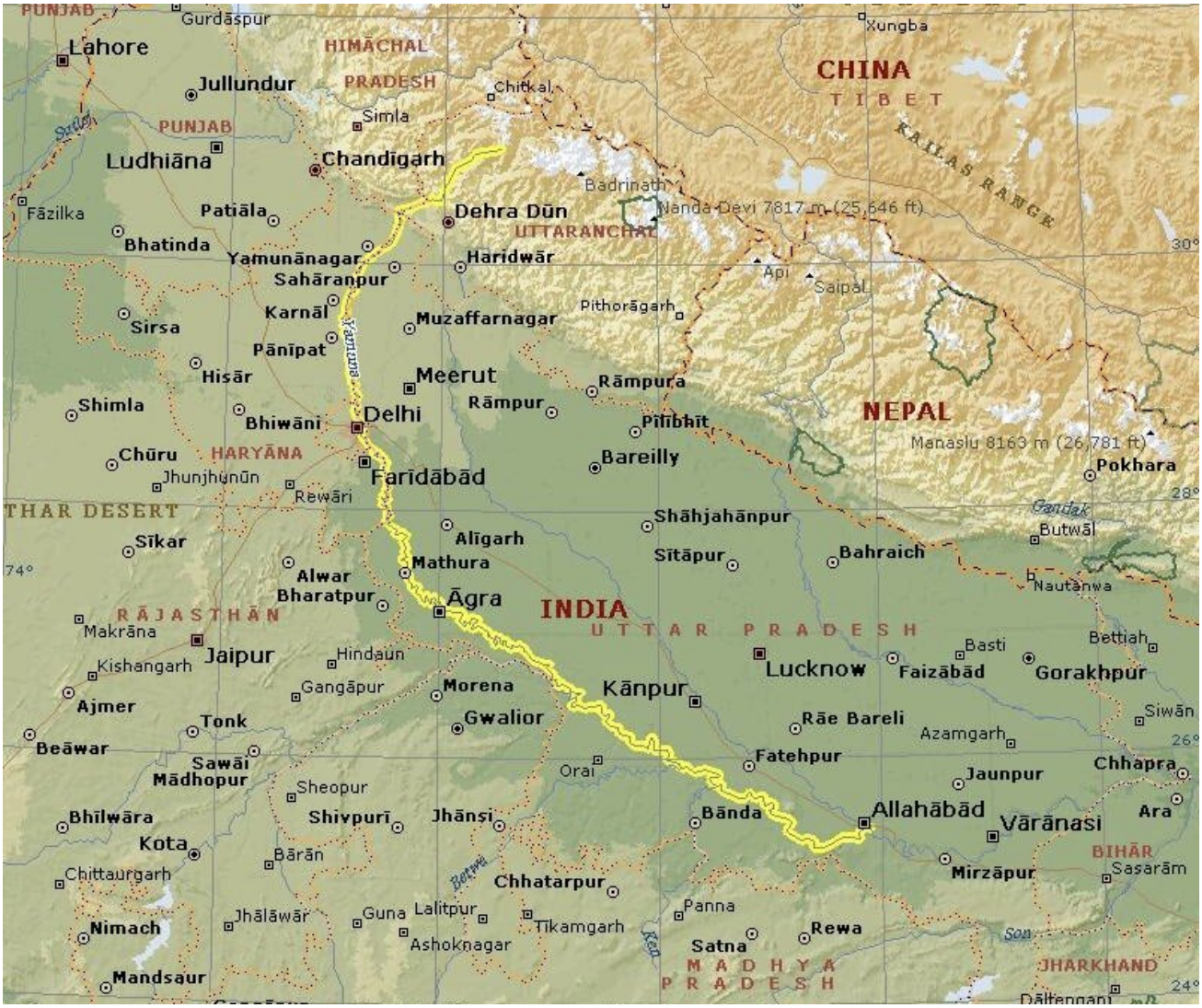
- **Solution:**
    - **Ozone-based units** to treat ammonia levels up to 4 ppm should be installed at Water Treatment Plants.
    - The laying of a **conduit pipeline to separate drain carrying potable water and sewage water.**
        - The **National Green Tribunal-appointed Yamuna Monitoring Committee** has also said that fast-track approvals should be given to build a conduit.
        - The Committee had also recommended to the Ministry of Jal Shakti earlier this year to rework the 1994 **water sharing pact** between **Uttarakhand, Himachal Pradesh, Haryana, Delhi and UP** to revive the river by releasing **more fresh water into it.**

Ammonia

- Its chemical formula is **NH_3.**
- It is a **colourless gas** and is used as an **industrial chemical** in the **production of fertilisers, plastics, synthetic fibres, dyes and other products.**
- It occurs naturally in the environment from the breakdown of **organic waste matter,** and may also find its way to ground and surface water sources through **industrial effluents, contamination by sewage or through agricultural runoff.**

Yamuna

- The river Yamuna, a major **tributary of river Ganges,** originates from the **Yamunotri glacier near Bandarpoonch peaks** in the Mussoorie range of the lower Himalayas in Uttarkashi district of Uttarakhand.
- It meets the **Ganges at the Sangam in Prayagraj,** Uttar Pradesh after flowing through **Uttarakhand, Himachal Pradesh, Haryana and Delhi.**
- **Length:** 1376 km
- **Important Dam:** Lakhwar-Vyasi Dam (Uttarakhand), Tajewala Barrage Dam (Haryana) etc.
- **Important Tributaries:** Chambal, Sindh, Betwa, Ken, Tons, Hindon.


PUNJAB
Gurdāspur
Lahore
HIMĀCHAL
PRADESH
Jullundur
Chitkul
Xungba
CHINA
TIBET
KAILAS RANGE
Simla
PUNJAB
Ludhiāna
Chandīgarh
Badrinath
Nanda Devi 7817 m (25,646 ft)
Fāzilka
Patiāla
Dehra Dūn
UTTARANCHAL
Bhatinda
Yamunānagar
Haridwār
Api
Saipal
30°
Sahāranpur
Karnāl
Pithorāgarh
Sirsa
Muzaffarnagar
Pānīpat
Yamuna
Hisār
Meerut
Rāmpura
Shimla
Rāmpur
NEPAL
Delhi
Bhiwāni
Pilibhīt
Manaslu 8163 m (26,781 ft)
Chūru
HARYĀNA
Bareilly
Pokhara
Jhunjhunūn
Farīdābād
Rewāri
28°
THAR DESERT
Shāhjahānpur
Gandak
Butwāl
Sīkar
Alīgarh
Sītāpur
Bahraich
74°
Mathura
Alwar
Nautanwa
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INDIA
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Bhīlwāra
Shivpurī
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Guna
Lalitpur
Panna
Nimach
Tikamgarh
Rewa
Ashoknagar
Satna
Son
Mandsaur
MADHYA PRADESH
JHARKHAND
24°

Source: IE