Avian Botulism in Rajasthan | Rajasthan | 18 Nov 2024

Why in News?

Recently, the Centre for Avian Research Institute reported the death of at least 600 migratory birds in Rajasthan.

- **High temperatures and reduced salinity in** Sambhar Lake likely created conditions that triggered Avian Botulism, causing the **mass deaths of** migratory birds.

Key Points

- **About Avian botulism:**
  - It is a neuro-muscular illness caused by **Botulinum (natural toxin**) that is produced by a bacteria Clostridium botulinum.
    - The bacteria is **commonly found in the soil, rivers, and seawater. It affects both humans and animals.**
    - It also needs **anaerobic (absence of oxygen)** conditions and **does not grow in acidic conditions.**
  - It **affects the nervous system** of birds, **leading to paralysis** in their legs and wings.
    - Bacterial spores are widespread in wetland sediments and are commonly found in wetland habitats.
    - They are **present in invertebrates** like insects, mollusks, crustaceans, and even healthy vertebrates, including birds.
  - The outbreaks of avian botulism **tend to occur when average temperatures are above 21 degrees celsius,** and during droughts.
  - The **deaths began on 26th October 2024,** and continued for approximately two weeks.
- **Contributing Environmental Factors:**
  - **Jaipur district**, 70 km from Sambhar Lake, **recorded above-average temperature**s throughout October.
  - Sambhar Lake experienced **reduced oxygen levels due to the absence of rainfall.**
- **Vulnerability of Migratory Birds**
  - Migratory birds arrive **weakened from long journeys,** making them more susceptible to diseases.
  - Decaying bird carcasses attract maggots, which further **contaminate the water and infect other birds** or animals.
- **Management and Challenges**
  - Avian botulism **cannot be treated**, but immediate **removal and disposal of affected birds are recommended** to limit the spread.
  - Sambhar Lake **experienced a similar die-off in 2019**, resulting in the deaths of nearly 18,000 birds.
  - **Outbreaks are hard to predict** as they depend on specific environmental conditions aligning, such as a shift from high to low salinity coinciding with the arrival of migratory birds.
- **Global Perspective**
  - **Spores of Clostridium botulinum can survive for years** but produce toxins only under favorable environmental conditions.
  - Similar outbreaks have been observed in **Australia and the United States** during periods of reduced salinity.
  - Globally, **around 57 diseases have been reported among wild birds** , highlighting the

broader ecological risks.

Sambhar Lake

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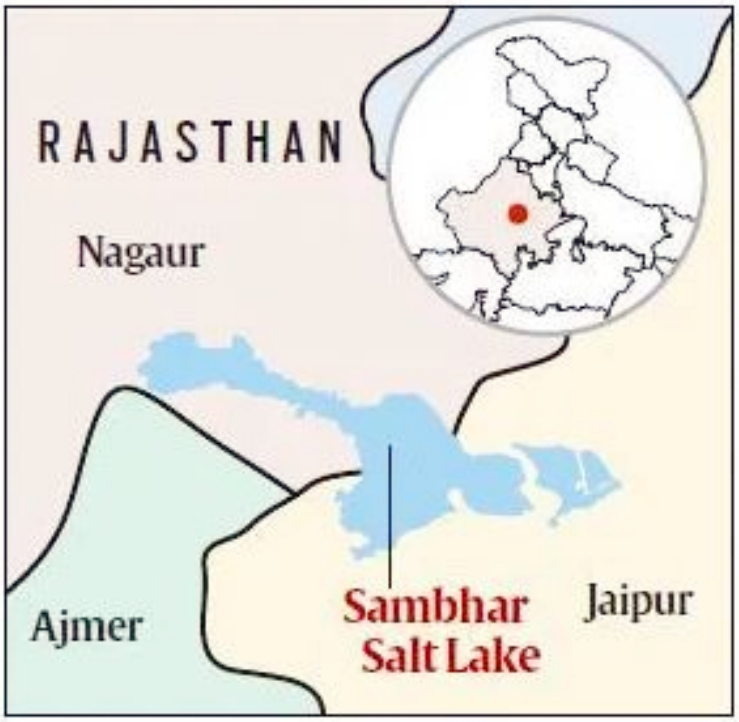

- **Location:**
  - Situated about 80 km southwest of Jaipur, in east-central **Rajasthan.**
- **Features:**
  - It is the **largest inland salt lake in India.** It represents the depression of the Aravalli Range.
  - The lake's **salt supply was worked by the Mughal dynasty** (1526–1857) and it was **later owned jointly by the Jaipur and Jodhpur princely states.**
- **Ramsar Site:**
  - It is a **wetland** of '**international importance'** under the Ramsar Convention, declared in 1990.
- **Rivers:**
  - It receives water from **six rivers,** namely Samaod, Khari, Mantha, Khandela, Medtha, and Roopangarh.
- **Vegetation:**
  - The vegetation present in the catchment area is **mostly xerophytic type.**
  - Xerophyte is a **plant adapted for growth under dry conditions.**

The Central Avian Research Institute of India (CARI)

- It is a **research institute located at Izzatnagar near Bareilly, Uttar Pradesh.**
- It was **established in 1979** under the administrative control of **Indian Council of Agricultural Research (ICAR).**
- It **studies poultry science**, including avian genetics, breeding, nutrition and feed technology, and avian physiology and reproduction, for the betterment of the Indian poultry industry.