Cyclone Resilient Planning

This article is based on **Tauktae, Yaas and planning for the next** which was published in The Hindu on 24/08/2021. It talks about the challenges of increasing frequency of the cyclones in India and measures to be taken to deal with the issues.

The severe cyclones, **Tauktae** and **Yaas**, which battered India earlier this year, made landfall on the country's western coast, Gujarat, and the eastern coast, Odisha, respectively.

Both storms caused massive damage to infrastructure, the agricultural sector, and houses. Around 2.5 million people were evacuated to cyclone shelters and relief camps in these two States. The large-scale uprooting of trees in the urban areas affected already depleting green cover.

Thus, during the **Covid-19 pandemic**, these cyclones caused additional financial responsibility for State governments. The health costs are also an issue.

Cyclone Challenge in India

- Every year, around five to six tropical cyclones are formed in the **Bay of Bengal** and the **Arabian Sea;** of these, two to three turn severe.
- The Indian coastline is around 7,500 km; there are 96 coastal districts (which touch the coast or are close to it), with 262 million people exposed to cyclones and tsunamis.
- **Increasing sea surface temperatures** in the northern Indian Ocean and the **geo-climatic conditions** in India have led to a rise in the frequency of devastating cyclones in the coastal States accounting for **7% of the global tropical cyclones,** according to India Meteorological Department (IMD), 2013 data.
- Between 1891 and 2020, out of the 313 cyclones crossing India's eastern and western coasts, 130 were classified as severe cyclonic storms.
    - The west coast experienced 31 cyclones, while 282 cyclones crossed the east coast.
    - The Odisha coast witnessed 97 cyclones, followed by Andhra Pradesh (79), Tamil Nadu (58), West Bengal (48), Gujarat (22), Maharashtra/Goa (7), and Kerala (2).

- The **World Bank** and the **United Nations** (2010) estimate that around 200 million city residents would be exposed to storms and earthquakes by 2050 in India.

Economic Cost of Cyclone Disasters

- **Second Most Expensive:** Among the natural disasters, cyclones constituted the **second most frequent phenomena** that occurred in 15% of India's total natural disasters over 1999-2020.
    - During the same period, 12,388 people were killed, and the damage was estimated at USD 32,615 million.
    - Cyclones are the second most expensive in terms of the costs incurred in damage, accounting for 29% of the total disaster-related damages after floods (62%).
- **Third Most Lethal Disaster:** In addition, they are the third most lethal disaster in India after earthquakes (42%) and floods (33%).
    - However, fatalities due to cyclones declined from 10,378 in 1999 to 110 in 2020.
    - The significant drop was on account of improved **early warning systems, cyclone forecasting,** and **better disaster management** activities such as timely evacuation, rehabilitation and relief distributions.
        - But these measures are not adequate to achieve a zero-fatality approach and minimise economic losses from cyclones.
- Between 1999 and 2020, cyclones inflicted substantial damage to public and private properties, amounting to an **increase in losses from USD 2,990 million to USD 14,920 million** in the absence of long-term mitigation measures.
    - In addition, damages caused due to cyclones increased nine times during the same period.
- **Precautionary Expenditure:** Cyclones also led to an increase in the fiscal burden of governments through increased spending to **implement effective cyclone preparation** measures.
- India lost around **2% of GDP and 15% of total revenue over 1999-2020.** According to the **Global Climate Risk Index report 2021,** India ranks the seventh worst-hit country globally in 2019 due to the frequent occurrence of extreme weather-related events.
    - Moreover, the report showed that India lost around 2,267 human lives, while damages stood at USD 68,812 million in **Purchasing Power Parity (PPP)** terms in 2019.
    - In the same year, India ranked first concerning human deaths and economic losses due to extreme weather-related events.
    - The **Asian Development Bank's** report in 2014 estimated that India would suffer a loss of around 1.8% of GDP annually by 2050 from climate-related events.

Way Forward

- **Take Precautionary Measures:** It is imperative to improve the cyclone warning system and revamp disaster preparedness measures.
- **Structural Measures:** The Government must widen the cover under shelterbelt plantations and help regenerate mangroves in coastal regions to lessen the impact of cyclones.
    - In addition, adopting cost-effective, long-term mitigation measures, including building **cyclone-resilient infrastructure** such as constructing storm surge-resilient embankments, canals and improving river connectivity to prevent waterlogging in low-lying areas are important.
    - Installing **disaster-resilient power infrastructure** in the coastal districts, providing concrete houses to poor and vulnerable households, and creating massive community awareness campaigns are essential.
- **Collective Efforts:** Healthy coordination between the Centre and the States concerned is essential to collectively design disaster mitigation measures.

  It is only such a collective mitigation effort by the Centre and States that can help reduce the fiscal burden of States and also be effective in minimising disaster deaths.
- **Case Study - State Level Interventions:**
    - In the aftermath of the **1999 super cyclone,** the Government of Odisha took up various cyclone mitigation measures which included installing a disaster warning system in the coastal districts, and construction of evacuation shelters in cyclone-prone districts.
    - Other steps were the setting up of the **Odisha State Disaster Management Authority (OSDMA),** conducting regular cabinet meetings for disaster preparedness, and building the **Odisha Disaster Rapid Action Force (ODRAF).**
    - All these activities have helped to minimise the toll from cyclonic storms such as **Hudhud, Fani, Amphan, and Yaas.** However, still Odisha's disaster management model is inadequate to minimise the economic losses that result from cyclones.

Drishti Mains Question

With a rise in the frequency of devastating cyclones, India needs to look at long-term mitigation measures. Discuss.