



Mains Practice Question

Q. Why is the Bay of Bengal more prone to cyclones compared to the Arabian Sea? Discuss this phenomenon with reference to recent cyclones in India. **(250 words)**

23 Dec, 2024 GS Paper 1 Geography

Approach

- Introduce the answer by giving a data justifying more cyclones in Bay of Bengal than Arabian Sea
- Give Reasons for Higher Cyclonic Activity in the Bay of Bengal than Arabian Sea
- Delve into Recent Key Cyclones Hitting Indian coast
- Conclude suitably.

Introduction

The **Indian subcontinent**, with an **8,041 km coastline**, is **highly vulnerable to cyclones**, with the **Bay of Bengal witnessing nearly 4 times the number of cyclones as the Arabian Sea**.

- This phenomenon is influenced by **geographical, meteorological, and oceanic factors**, exacerbated by climate change and anthropogenic activities.

Body

Reasons for Higher Cyclonic Activity in the Bay of Bengal than Arabian Sea:

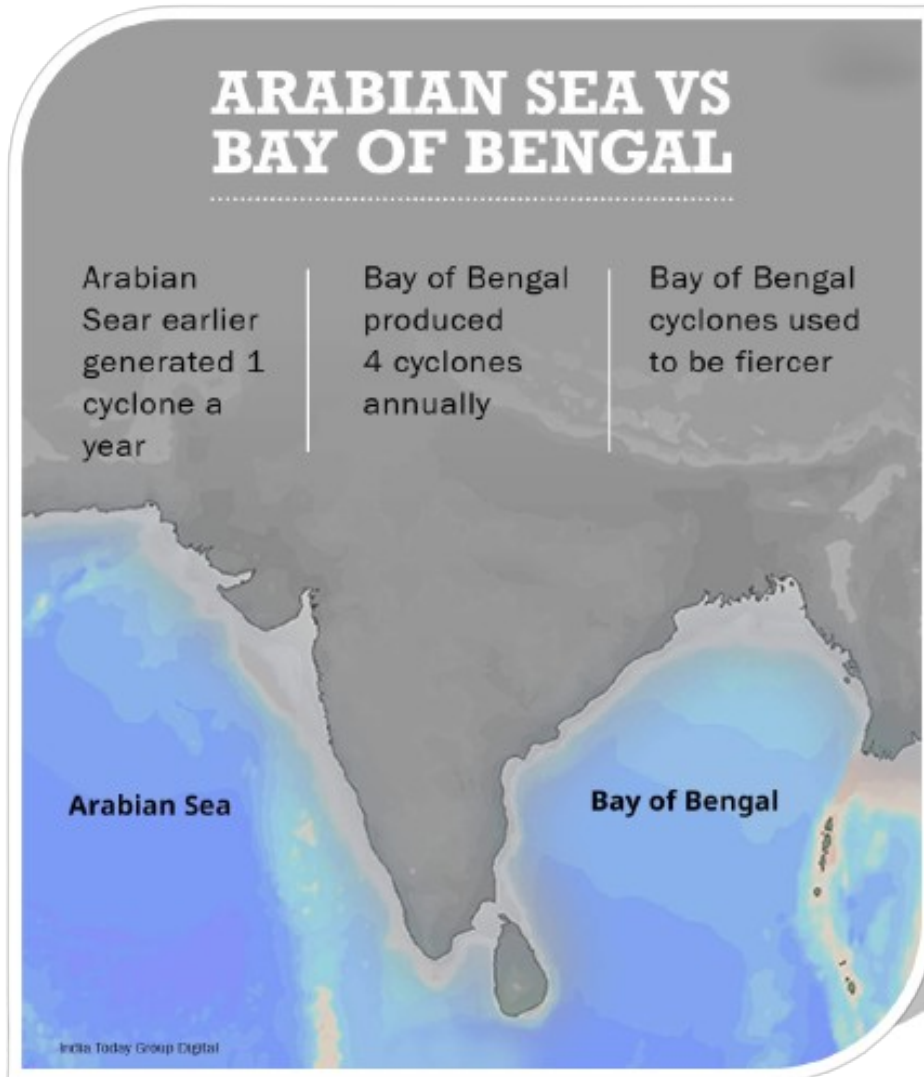
- **Geographical and Oceanographic Factors:**
 - **Funnel-like Shape:** The **Bay's concave structure** directs and amplifies storm surges toward the coasts of **India, Bangladesh, and Myanmar**, intensifying their impacts.
 - This unique geography is **absent or minimal in the Arabian Sea**, which lacks a similarly pronounced funnel-like shape, reducing the amplification of storm surges.
 - **Shallow Coastal Waters:** These waters **allow storm surges to rise significantly higher**, causing severe flooding when cyclones make landfall.
- **Favorable Climatic and Meteorological Conditions**
 - **High Sea Surface Temperatures (SSTs):** SSTs in the Bay of Bengal remain consistently above 28°C, often exceeding **30°C-32°C**, which is ideal for cyclone formation.
 - **Warm SSTs fuel moisture-laden air and evaporation**, providing energy for storms to intensify.
 - **Warm Water Influx from Rivers:** Major rivers like the **Ganga, Brahmaputra, and Irrawaddy** discharge warm freshwater into the Bay, preventing the cooling of surface waters.
 - Unlike the **Arabian Sea, where water mixes vertically**, the Bay's stratified layers sustain warm surface temperatures.
- **Atmospheric Dynamics**
 - **Weak Wind Shear:** In the Bay, the **vertical difference in wind speeds (wind shear)** is **relatively low**, allowing cyclones to develop and maintain structure.
 - **Moisture-Laden Winds:** Warm, humid air currents over the Bay enhance cyclone

intensity, particularly **during pre-monsoon and post-monsoon seasons.**

▪ **Other Factors:**

- **Post-Monsoon Effect:** The retreating monsoon during October-November creates **favorable conditions for cyclones in the Bay**, with low-pressure zones and stagnant winds aiding their genesis.

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Recent Key Cyclones Hitting India's East Coast:

- **Cyclone Amphan (2020):**
 - **Intensity:** Super Cyclonic Storm.
 - **Impact:** Massive destruction to eastern India especially West Bengal & Odisha
- **Cyclone Yaas (2021):**
 - **Intensity:** Very Severe Cyclonic Storm.
 - **Impact:** Severe flooding in Odisha and West Bengal.
- **Cyclone Mocha (2023):**
 - **Intensity:** Extremely Severe Cyclonic Storm.
 - **Impact:** Widespread destruction in Bangladesh and Myanmar.

Conclusion

Bay of Bengal's geographical features and high sea surface temperatures make it more **prone to cyclones**, with **climate change intensifying their frequency and severity.** Although the **Arabian Sea** was traditionally less active, recent cyclones like **Tauktae(2021) and Biparjoy (2023)** highlight the growing threat **attributed to warming seas.**

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