All About Cyclone

Why in news?

Cyclone Remal, after its landfall over the West Bengal-Bangladesh coast turned into a cyclonic storm and affected large parts of North East India.

What is a cyclone?

- **About**- As per National Disaster Management Authority (NDMA), cyclones result from *atmospheric disturbances* surrounding a low-pressure area characterised by rapid and often destructive air circulation
- **Air circulation**- The air circulates inward in an anticlockwise direction in the Northern Hemisphere and clockwise in the Southern Hemisphere.
- **Occurrence**- Cyclonic winds move across nearly all regions of the Earth except the equatorial belt.

Types of cyclone	About
Tropical cyclone	They form over warm ocean waters near the equator and are characterized by a low-pressure center, strong winds, and heavy rain.
Extratropical cyclone	They are also known as *mid-latitude cyclones*, form outside the tropics and typically occur between 30° and 60° latitude.
Subtropical cyclone	They have characteristics of both tropical and extratropical cyclones, they typically form in the subtropics, between 20° and 35° latitude,
Polar lows	They are also known as *Arctic or Antarctic hurricane*s, are small, intense, short-lived cyclones that form over the ocean in polar regions.
Mesocyclones	They are *smaller-scale cyclonic circulations* associated with severe thunderstorms. They occur within a convective storm and can lead to the development of tornadoes.
Medicanes	*Mediterranean hurricanes*, are rare tropical-like cyclones that occur in the Mediterranean Sea.

- **Conditions of the cyclone**-
    - Large and continuous supply of warm and moist air that can release enormous latent heat.
    - Strong *Coriolis force* that can prevent filling of low pressure at the centre (absence of Coriolis force near the equator prohibits the formation of tropical cyclone between 0 -5 latitude).
    - Unstable condition through the troposphere that creates local disturbances around which a cyclone develops.

    - Absence of strong vertical wind wedge, which disturbs the vertical transport of latent heat

- **Cause**- By atmospheric disturbances around a low-pressure area distinguished by swift and often destructive air circulation.
- **Eye of the cyclone-** Low-pressure center of the cyclone
- The lower the pressure in the eye, the more intense is the cyclone.
- **Eye-wall-** Surrounds the eye with the strongest winds and heaviest rain and is the most destructive part of the cyclone.
- **Storm surge-** The abnormal rise in sea level due to cyclonic storms.
- **Cyclone prone areas-** India's east and west coasts are affected by cyclones annually, mostly in pre-monsoon and post-monsoon seasons.
- **Indian tropical storms-** Climatologically, about 5 cyclones develop in the North Indian Ocean basin comprising the Bay of Bengal and the Arabian Sea every year.
- **Cyclone Remal-** Itis a severe cyclonic storm that was moderately intense and deadly tropical cyclone which affected West Bengal and Bangladesh.

  Remal was named by Oman following standard conventions of naming tropical cyclones, in arabic remal means "Sand"

- It was the *first depression and the first cyclonic storm* of the 2024 North Indian Ocean cyclone season.
- Heavy rains caused by the cyclone triggered landslides in several places in Meghalaya, Mizoram, Assam, and Nagaland.

What are the impacts of cyclone?

- **Heavy rainfall-** Cyclones typically bring heavy rainfall, leading to flooding in low-lying areas.
- **Disrupt livelihood**- The heavy rainfall causes flooding which result in damage to homes and businesses, loss of crops, and disruption of transportation networks.
- **Storm surges-** The combination of strong winds and low atmospheric pressure associated with cyclones can generate storm surges, which are elevated sea levels that inundate coastal areas.
- **Displacement-** It can result in the displacement of large numbers of people as homes are destroyed and areas become uninhabitable due to flooding and other damage.
- **Loss of life-** It can cause loss of life, both directly through the destruction caused by the storm itself and indirectly through factors such as flooding, landslides, and the disruption of essential services.
- **Environmental impact-** Cyclones can have significant environmental impacts, including the destruction of habitats, contamination of water sources due to flooding, and damage to ecosystem.

What are the steps taken by India to mitigate the impacts of cyclone?

- **National Cyclone Risk Mitigation Project (NCRMP)-** It was launched in 2011 funded by World Bank, it's aim is to reduce vulnerabiltiy to cyclones and other hydro-

metrological hazards.

- **Categories-** NCRMP classifies States based on vulnerability namely
    - Higher vulnerability States i.e. Andhra Pradesh,Gujarat,Odisha,Tamil Nadu and West Bengal.
    - Lower vulnerability States- Maharashtra, Karnataka, Kerala, Goa, Lakshadweep, Daman and Diu, Andaman and Nicobar Islands
- **Web-CRA**- Web based Composite Risk Atlas uses deterministic hazard and vulnerability analysis modelling based on historical cyclone event.
- **HmRAP-** Hydro-meteorological Resilience Action Plan is developed in 6 cities namely Panaji (Goa), Ratnagiri (Maharashtra), Mangalore (Karnataka), Kochi (Kerala),Porbandar (Gujarat) and Bidhan Nagar (West Bengal).
- **CMhRFS** - Comprehensive Multi-hazard Risk Financing Strategy establishes a robust Disaster Risk Financing Strategy for the targeted States (namely Uttarakhand, Odisha, Kerala& Gujarat) and develops Multi-State Disaster Risk Insurance Poo

References

1. Indian Express- Mizoram rain stone quarry collapse
2. NDMA- Cyclone risk mitigation preparation

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