Cyclone Dana Hits Odisha: Impact, Causes, and Key Details

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What's in today's article?

- Why in News?
- What is Tropical Cyclone?
- Naming of cyclone
- What is Landfall of a cyclone?

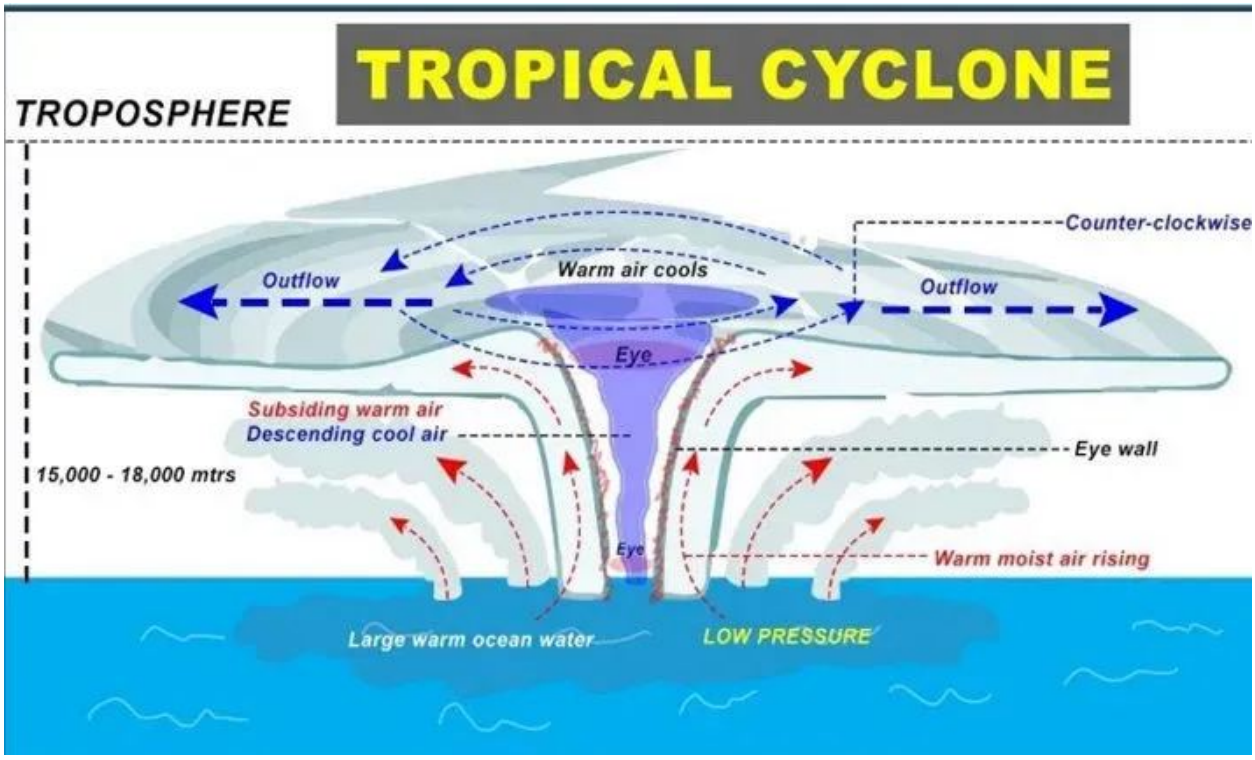
Why in News?

Severe Cyclonic Storm Dana made landfall on the Odisha coast on the night of October 24. The storm made landfall at a speed of 100 to 110 kmph gusting at 120 kmph.

What is Tropical Cyclone?

- **About**
  - Cyclones that develop in the regions between the Tropics of Capricorn and Cancer are called tropical cyclones.
  - The World Meteorological Organisation uses the term 'Tropical Cyclone' to cover weather systems in which winds exceed 'Gale Force' (minimum of 34 knots or 63 kph).
  - Tropical cyclones are the progeny of ocean and atmosphere, powered by the heat from the sea; and driven by easterly trades and temperate westerlies, high planetary winds and their own fierce energy.

- **Formation of cyclones**



- Tropical Cyclone is a **weather phenomenon**, which is formed **only over warm ocean waters near the equator**.
- **Characteristics of a Tropical Cyclone:**
  - The **centre of a cyclone is very calm and clear with very low air pressure**. The average speed is **120 kmph**.
  - They have closed **isobars** which leads to greater velocity.
- Isobars are imaginary lines on a weather map that connect locations with equal atmospheric pressure.
  - They develop over oceans and sea only.
  - They move from east to west under the influence of trade winds.
  - They are seasonal in nature.
- **Classification of cyclones**
  - Cyclones are classified **on the basis of wind speed** by the Indian Meteorological Department (IMD):
    - **Depression:** Wind speeds of between 31–49 km/h
    - **Deep Depression:** Between 50-61 km/h
    - **Cyclonic Storm:** Between 62–88 km/h
    - **Severe Cyclonic Storm:** Between 89-117 Km/h
    - **Very Severe Cyclonic Storm:** Between 118-166 Km/h
    - **Extremely Severe Cyclonic Storm**: Between 166-221 Km/h
    - **Super Cyclonic Storm**: Above 222 Km/h
- **Category of a tropical cyclone**
  - The category of a tropical cyclone is determined by its sustained wind speed, as measured by the **Saffir-Simpson Hurricane Wind Scale**.
  - It is classified into five categories — Category 1 to Category 5.

    - While Category 1 tropical cyclones bring winds of 119 to 153 kmph, Category 5 tropical cyclones, which are the strongest, have winds of 252 kmph or higher.
- Storms that reach Category 3 and higher are considered major tropical cyclones due to their potential to inflict significant damage.
- **Tropical cyclones are known by different names in various regions**
    - **Hurricanes** – In the in the West Indian islands in the Caribbean Sea and Atlantic Ocean.
    - **Tornados** – In the Guinea lands of West Africa and southern USA
    - **Typhoons** – In the Northwest Pacific Ocean, particularly affecting East and Southeast Asia (e.g., Japan, Philippines, China, Taiwan).
    - **Cyclones** – In the Southwest Indian Ocean (off the coast of Africa, Madagascar), the Southeast Indian Ocean, and the Southwest Pacific Ocean.
    - **Willy-Willies** – An informal term used for tropical cyclones in Australia.

Naming of Cyclones

- **Cyclone Dana**
    - The name Dana was suggested by Qatar to the World Meteorological Organisation/United Nations Economic and Social Commission for Asia and the Pacific (WMO/ESCAP).
- **Process of naming**
    - Worldwide, there are **six regional specialised meteorological centres** (RSMCs) and **five regional Tropical Cyclone Warning Centres** (TCWCs) mandated for issuing advisories and naming of tropical cyclones.
- The five regional Tropical Cyclone Warning Centres (TCWCs) are:
    - ESCAP/WMO Typhoon Committee,
    - WMO/ESCAP Panel on Tropical Cyclones,
- **It is responsible for naming of cyclones in the Indian Ocean**.
    - RA I Tropical Cyclone Committee,
    - RA IV Hurricane Committee,
    - RA V Tropical Cyclone Committee.
- IMD is one of the six RSMCs to provide tropical cyclone and storm surge advisories to under the **WMO/Economic and Social Commission for Asia-Pacific (ESCAP).**
- WMO/ ESCAP is an inter-governmental regional body jointly established by the World Meteorological Organization (WMO) and the United Nations Economic and Social Commission for Asia-Pacific (ESCAP) in 1972.
- **Members** – It has 13 countries as its members.
- Bangladesh, India, Iran, Maldives, Myanmar, Oman, Pakistan, Qatar, Saudi Arabia, Sri Lanka, Thailand, United Arab Emirates and Yemen.
- They contribute to a set of names which are assigned sequentially whenever a cyclonic storm develops.
- The list of 169 cyclone names released by IMD in 2020 was provided by these countries — 13 suggestions from each of the 13 countries.
    - So, the tropical cyclones forming over different Ocean basins are named by the concerned RSMCs & TCWCs.

What is landfall of a cyclone?

- Landfall is the event of a tropical cyclone coming onto land after being over water.
- As per the IMD, a tropical cyclone is said to have made a landfall when the center of the storm – or its ***eye*** – moves over the coast.
    - The “eye” of a cyclone is a region of relatively calm weather found at the center of the storm.
    - Within the eye, winds are light and variable, often with clear or only partially cloudy skies.
    - The size of the eye can vary significantly, ranging from a few kilometers to over 50 kilometers (30 miles) in diameter in larger cyclones.
- During landfall, the outer bands of the storm may have already reached the coast, bringing strong winds, heavy rain, and storm surge.
- Landfall marks the moment when the cyclone officially reaches the land.
    - A landfall should not be confused with a ‘direct hit’, which refers to a situation where the core of high winds (or eyewall) comes onshore but the centre of the storm may stay remain offshore.

Q.1. What is a tropical cyclone and how does it form?

A tropical cyclone is a severe weather system that forms over warm ocean waters near the equator. Powered by heat from the sea, it is characterized by a calm center (eye) and strong winds, often causing significant damage upon landfall.

Q.2. How are cyclones named and categorized?

Cyclones are named by regional meteorological centers, like the IMD, based on predefined lists. They are categorized based on wind speed, ranging from Depression to Super Cyclonic Storm, with categories indicating potential damage levels.

News: Cyclone Dana nears Odisha, West Bengal coasts: What is the landfall of a cyclone? | NDMA | The Hindu | Indian Express