Cyclone: UPSC GS - I Notes

Cyclone is any low-pressure area with winds spiralling inwards. Cyclones rotate anti-clockwise in Northern Hemisphere and rotate clockwise in Southern Hemisphere. The process of Cyclone formation and intensification is called Cyclogenesis.

There are various types of cyclones depending on the type of prevailing low-pressure system.

1. Tropical cyclone
2. Extratropical cyclone
3. Tornadoes

Cyclones are not only present on Earth but also spotted on other planets like Mars, Jupiter and Neptune. The Great Red Spot is the hurricane on Jupiter which is going on from 340 years. Great Black Spot was spotted in the Southern Hemisphere of Neptune.

How is a Cyclone formed?

When it comes to a formation or strengthening of a cyclone, Cyclogenesis plays a crucial role. It is an umbrella term to identify several different processes that result in a cyclone. Tropical cyclones are formed over warm ocean water near the equator. Warm moist air near the surface of the ocean rises upwards. This creates a low-pressure area near the surface. This results in the movement of cooler air from surrounding areas into the low-pressure area. Now even this cool air becomes warm and moist and rises up. The above cycle keeps continuing. The warm moist air which rises up, cools the water in the air, resulting in the formation of clouds. This whole system of clouds and winds spins and grows. This entire cycle continues resulting in a cyclone. When the winds reach a speed of 63 kmph, it is called tropical storm, when the winds reach a speed of 119 kmph it is called tropical cyclone or hurricane.

What is the basic structure of a cyclone?

Although separated by geographical limitations, there are many structural characteristics common to all cyclones. The centre of a cyclone consists of an area with the lowest atmospheric pressure in the region.

This area is commonly knowns as the 'eye'. Near the centre, the pressure gradient force and the force from the Coriolis effect must be in an approximate balance. If there is no balance then the cyclone will collapse on itself due to variation in pressure.

Because of the Coriolis effect, the wind flow around a large cyclone is counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere. In the Northern Hemisphere, the fastest winds relative to the surface of the Earth, therefore, occur on the eastern side of a

northward-moving cyclone and on the northern side of a westward-moving one; the opposite occurs in the Southern Hemisphere.

How are Cyclones addressed in Different Locations?

Cyclones are addressed by different names in different locations.

1. Hurricanes - In the Atlantic and Eastern Pacific.
2. Typhoons - In Southeast Asia
3. Cyclone - In the Indian Ocean and Western Pacific around Australia.

How are Cyclones named?

Lists and names of Cyclones are maintained and updated by an international committee of the World Meteorological Organisation (WMO). The original lists had only names of women. In 1979 men's name is also included. Names of men and women are used alternatively. Six lists are used in rotation. Hence the list used in 2020 will be used again in 2026. If the storms have wreaked havoc on a country, then the names will not be repeated again due to reasons of sensitivity. Examples are Katrina in the USA (2005), Sandy in the USA (2012), Haiyan in the Philippines (2013), Irma and Maria in the Carribean (2017).