

## UPSC Civil Services Examination

### Current Affairs & GS I (Geography)

#### What are Tropical Cyclones?

A tropical cyclone is a weather phenomenon that is essentially a rapidly rotating storm system with characteristics such as a low-pressure center, strong winds and thunderstorms that produce heavy rain, among others.

Tropical cyclones or cyclones in general have a different terms and names depending on their location and strength.

- These include 'hurricanes' in the north Atlantic Ocean and eastern North Pacific region,
- While being referred to as typhoons in the western North Pacific region.
- The nomenclature in the Southern Pacific and Indian Ocean severe tropical cyclones or simply cyclones.

#### What are the characteristics of a tropical cyclone?

Tropical cyclones are compact, circular winds with a diameter of 320km. Its winds swirl around a central region that has low atmospheric pressure. The rotation of the winds are largely driven by the low pressure centre and by the rotation of the Earth.

Thus cyclones rotate in a counterclockwise direction in the Northern Hemisphere and in a clockwise direction while in the Southern Hemisphere. Unlike the popular belief, cyclones do not cause massive damage to underwater coral reefs.

#### How are Tropical Cyclones formed?

In the tropics there is a narrow zone of low pressure which stretches across the equator. The winds on the north side of this zone blow from the north-east (the north-east trades) and on the southern side blow from the south-east (south-east trades).

The low pressure area is heated over the warm tropical ocean which leads to rise of air from this area in discrete parcels, ultimately causing the formation of thunderstorms. This creates a flow of very warm, moist, rapidly rising air, leading to the development of a centre of low pressure, or depression, at the surface.

There are various trigger mechanisms required to transform these cloud clusters into a tropical cyclone which is at least a trigger for bad weather. These trigger mechanisms depend on several conditions being 'right' at the same time. The most influential factors are:

1. A source of warm, moist air derived from tropical oceans with sea surface temperatures normally in the region of, or in excess, of 27 °C;
2. Winds near the ocean surface blowing from different directions converging and causing air to rise and storm clouds to form;
3. Winds which do not vary greatly with height - known as low wind shear. This allows the storm clouds to rise vertically to high levels;
4. Sufficient distance from the equator to provide spin or twist.

La Niña, a weather pattern most commonly found in the Southern Pacific region also cause cyclones depending upon the weather condition at the time

## Where and when do tropical cyclones occur?

Many tropical cyclones eventually drift far enough from the equator to move into areas dominated by westerly winds (found in the middle latitudes). These winds tend to reverse the direction of the tropical cyclone to an eastward path. As the tropical cyclone moves polewards it picks up forward speed and may reach 30 m.p.h. or more. An average tropical cyclone can travel about 300 to 400 miles a day, or about 3,000 miles before it dies out.

Tropical cyclones which occur in the Atlantic region and affect the Caribbean and USA usually comprise less than 15% of global tropical cyclone activity. Tropical cyclones also occur in various parts of the Pacific Ocean, and can affect coastal regions of Mexico, south-east Asia, north-east Australia and the South Pacific islands. Those that form in the Indian Ocean can affect India, Bangladesh, north-west Australia, some parts of east Africa and Indian Ocean islands such as Mauritius and Madagascar.