

Effects of Cyclone on the Monsoon

Why in news?

Cyclone formations are seen in the pre-monsoon cyclone season, closer to the monsoon onset.

What is monsoon?

- Indian Monsoon is the seasonal reversal of winds.
- The seasonal reversal of wind direction during a year accompanied by corresponding changes in precipitation.
- The monsoon or southwest monsoon is a sea-breeze from the Arabian Sea and the Bay of Bengal that officially onsets over Kerala on June 1 and retreats from Rajasthan by the end of September.
- It is then replaced by the retreating, or northeast monsoon in November which is the key source of rainfall for several parts of Tamil Nadu, Andhra Pradesh and north interior Karnataka.
- The monsoon is affected by
 1. The 3 tropical oceans namely, Indian, Atlantic, and Pacific.
 2. The 'atmospheric bridge' from the Arctic.
 3. The oceanic tunnel as well as the atmospheric bridge from the Antarctic Ocean.

What factors affect monsoon in general?

- Global warming also affects the cyclones over the Indian Ocean and the typhoons over the north-western Pacific Ocean.
- The effects of global warming on the monsoons can be seen in all stages of the [monsoon](#) from the onset, withdrawal, its seasonal total rainfall, and its extremes.

A 'bridge' refers to two faraway regions interacting in the atmosphere while a 'tunnel' refers to two remote oceanic regions connecting within the ocean.

Why does a cyclone's position matter?

- The location of the cyclone is critical for the transition of the monsoon trough.
- Some cyclones in the North Indian Ocean have had both positive and negative impacts on the onset of the monsoon.
- For example: The circulation of winds around the cyclones in the northern hemisphere is in the anticlockwise direction.
- If a cyclone lies further north in the Bay of Bengal, the back-winds blowing from the southwest to the northeast can pull the monsoon trough forward, and assist in the

monsoon's onset.

- **Anticyclones** - Super Cyclone Mocha's northwest to east trajectory over the Bay was the result of unusual [anticyclones](#) over the Arabian Sea and the Bay of Bengal.
- The back-winds of [Cyclone Mocha](#) helped the monsoon set in on time over the Andaman and Nicobar Islands.
- The anticyclones have warmed both the Arabian Sea and the Bay of Bengal by more than 1°C in the pre-monsoon season.

The monsoon trough is a low-pressure region that is a characteristic feature of the monsoons.

How southwesterly winds impact monsoon?

- **Southwesterly** are the winds that blow from the Southwest direction.
- Southwesterly winds over the Arabian Sea bring large quantities of moisture onto the Indian subcontinent.
- On the other hand, southwesterly winds over the Bay of Bengal are bad news for the monsoon.
- The monsoon winds over the southern Bay of Bengal sweep in from the southwest and west, but they turn around and head northwest towards India from the southeast.

How monsoon is impacted differently now?

- The strong southwesterly winds over the Bay of Bengal feeds the monstrous typhoons over the Northern Indian Ocean, South China Sea and the north-western Pacific Ocean.
- The monsoon trough struggles to get through these strong southwesterly winds.
- Global warming affected cyclogenesis wrench the dynamics of the monsoons, the onset and its evolution.
- The monsoon trough had a very reliable annual migration northwestward and the withdrawal southeastward.
- The annual pattern has changed due to effects of climate change.
- Click here to know about - [Delayed Arrival of the Southwest Monsoon](#)

What are cyclones Mawar, Biparjoy, and Guchol?

- **Cyclone Biparjoy** - It is not interacting much with the monsoon trough.
- The late birth of cyclone Biparjoy as well as the late onset of the monsoon are both closely related to typhoons in the north-western Pacific Ocean.
- **Cyclone Mawar** - Qualified as a 'super typhoon', thus far Mawar is the strongest typhoon to have taken shape in May.
- Mawar pulled winds across the equator into the North Indian Ocean, setting up southwesterly winds over parts of the Arabian Sea and the Bay of Bengal.
- **Cyclone Guchol** - Severe tropical storm Guchol in the east of the Philippines and is likely to continue northwest before turning to the northeast.
- Winds are blowing strongly towards the north-eastward over the Bay, making the monsoon trough to struggle to reach Kerala.

Reference

1. [The Hindu - How does a cyclone affect the monsoon's onset?](#)

