

km. A tropical cyclone or hurricane is like a heat engine that is energised by the release of latent heat on account of the condensation of moisture that the wind gathers after moving over the oceans and seas.

- Some initial conditions for the emergence of a tropical cyclone are:
  1. Large and continuous supply of warm and moist air that can release enormous latent heat.
  2. 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  $0^\circ$  -  $5^\circ$  latitude).
  3. Unstable condition through the troposphere that creates local disturbances around which a cyclone develops.
  4. Finally, absence of strong vertical wind wedge, which disturbs the vertical transport of latent heat.

#### 11.1.3.a Structure of Tropical Cyclone:

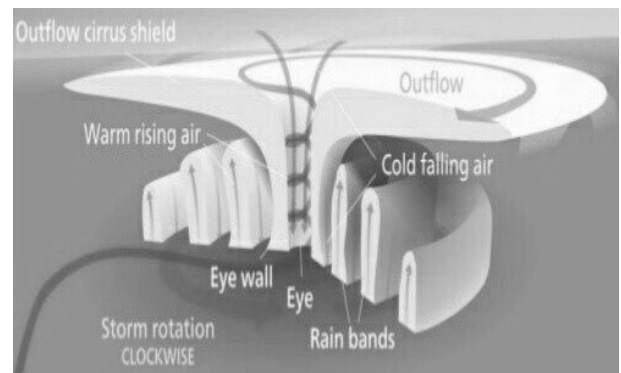
- The centre of the cyclone is mostly a warm and low-pressure, cloudless core known as eye of the storm. Expansion of the wind belt is about 10-150 km from the centre.

#### 11.1.3.b Spatial-temporal Distribution of Tropical Cyclone in India

- Owing to its Peninsular shape surrounded by the Bay of Bengal in the east and the Arabian Sea in the west, the tropical cyclones in India also originate in these two important locations.
- Though most of the cyclones originate between  $10^\circ$ - $15^\circ$  north latitudes during the monsoon season, yet in case of the Bay of

Bengal, cyclones mostly develop during the months of October and November.

- Originate between  $16^\circ$ - $2^\circ$  N latitudes and to the west of  $92^\circ$  E. By July the place of origin of these storms shifts to around  $18^\circ$  N latitude and west of  $90^\circ$ E near the Sunderban Delta. A surge is generated due to interaction of air, sea and land. The cyclone provides the driving force in the form of very high horizontal pressure-gradient and very strong surface winds. The sea water flows across the coast along with strong winds and heavy downpour.



#### 11.1.4 Floods:

- The causes of floods are well- established. Relatively slow in occurrences and often, occur in well-identified regions and within expected time in a year. Floods occur commonly when **water in the form of surface run-off** exceeds the **carrying capacity** of the river channels and streams and flows into the neighbouring low-lying flood plains.
- Floods can also be caused due to a **storm surge** (in the coastal areas), **high intensity rainfall** for a considerably longer time period, melting of ice and snow, reduction in the infiltration rate and presence of eroded material in the water due to higher rate of soil erosion.