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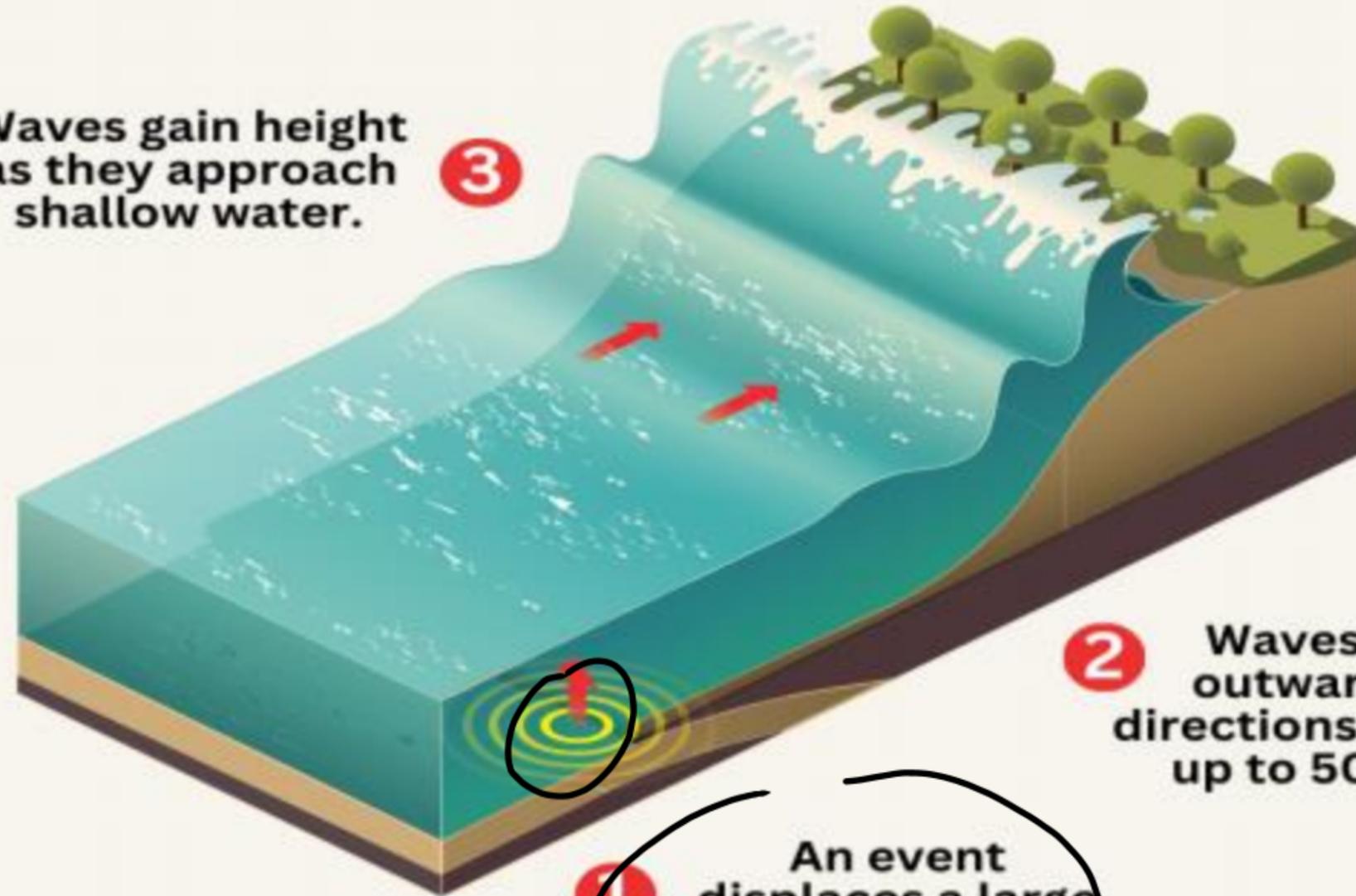
# Tsunami

- 2004
- wide scale displacement of water
- Earthquake, volcanic eruption.

## Tsunami

A tsunami is a giant wave caused by an earthquake or other event that displaces a lot of water.

Waves gain height as they approach shallow water.



3

4

Waves reach shore, often with little warning.

2

Waves move outward in all directions at speeds up to 500 mph.

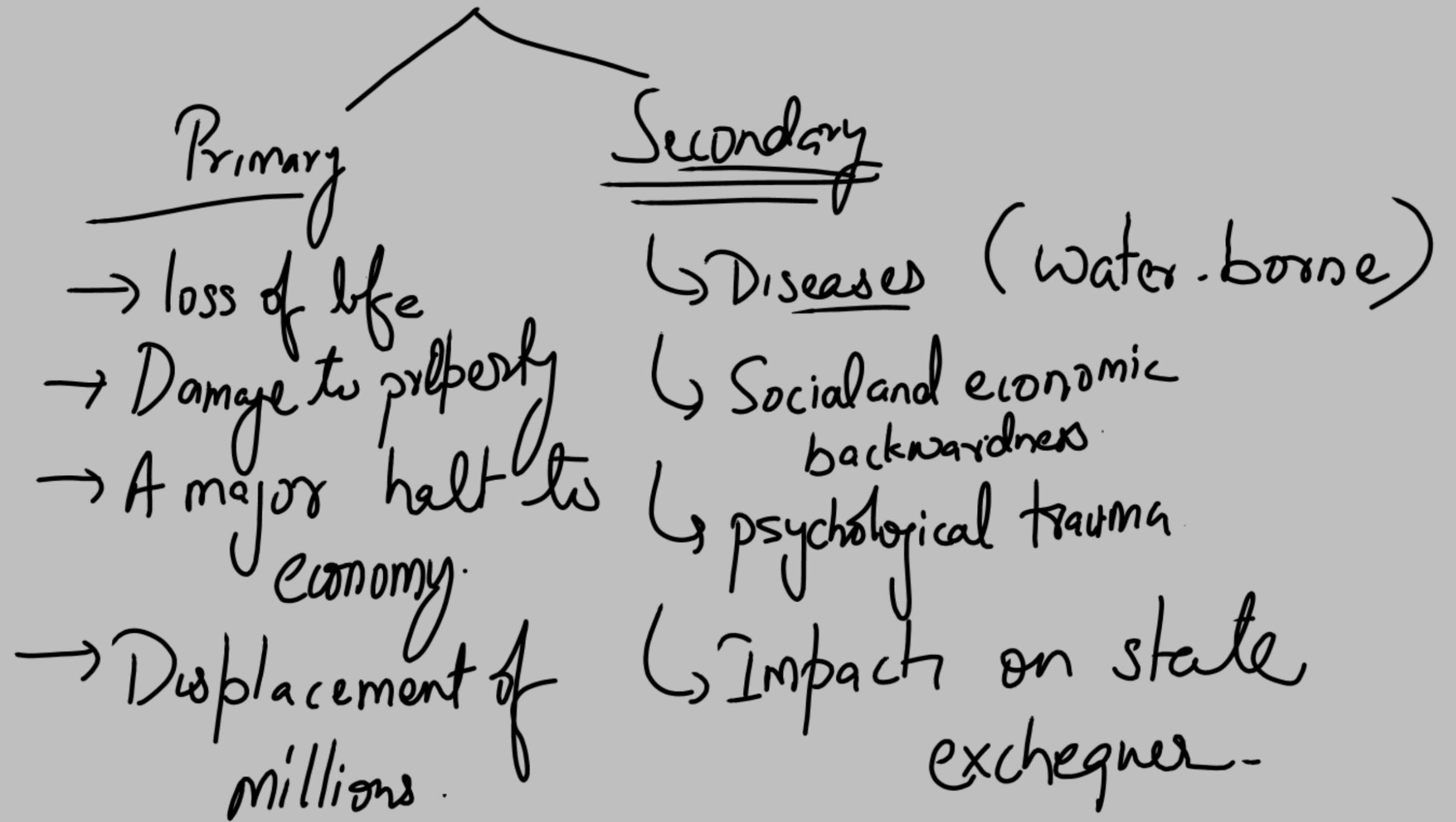
1

An event displaces a large volume of water.

Population

40% Coastal

# Consequences



Management

Preparedness

- Early warning system
- Community empowerment
- Hazard zone mapping
- Infrastructure quality improvement
- manpower plantation

Response

- Early dissemination of information  
⇒ quick and effective evacuation
- Early response from NDRF SDRF

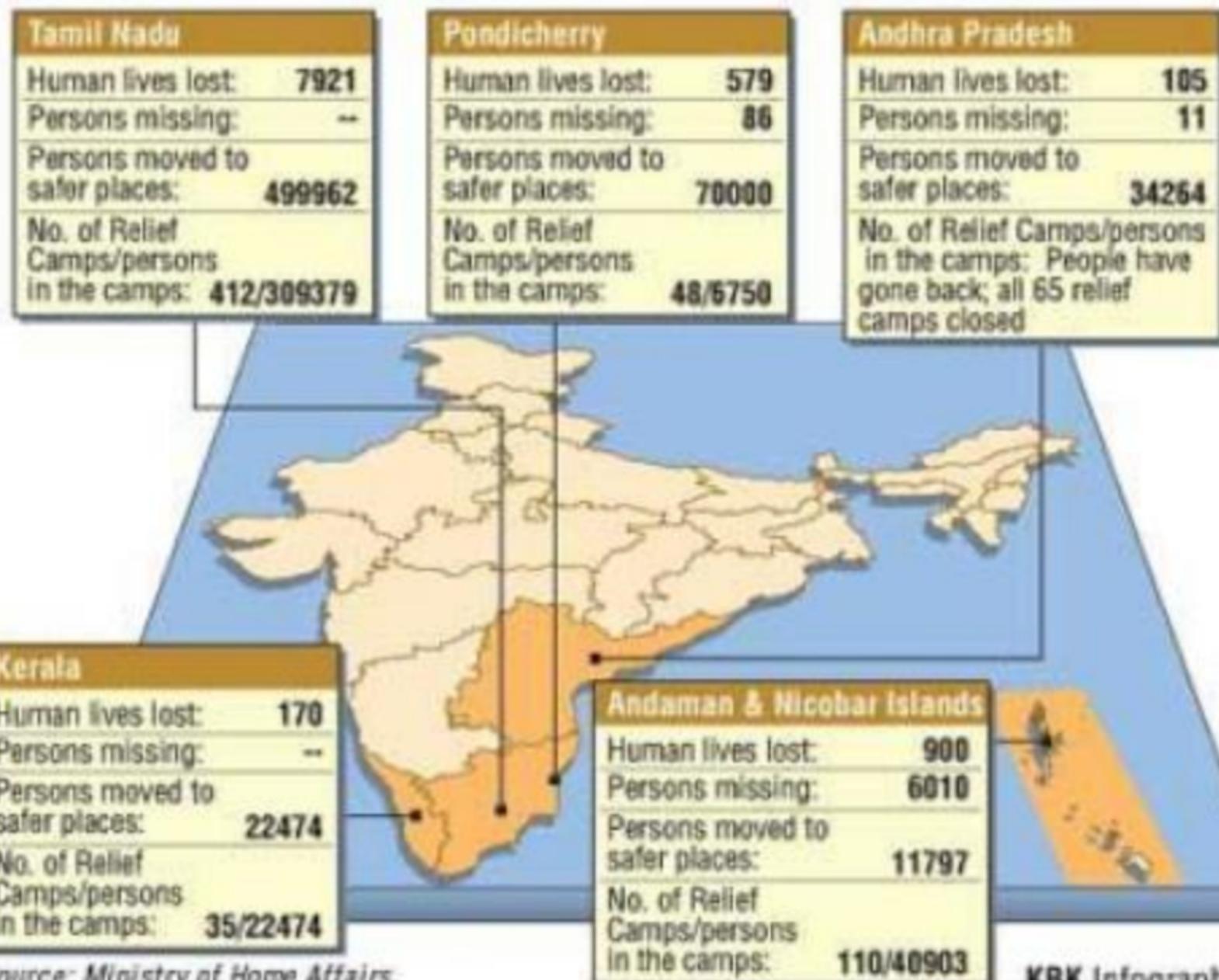
Resilience

Post disaster

- Medical facilities
- Rehabilitation
  - Home
  - livelihood
  - Morale

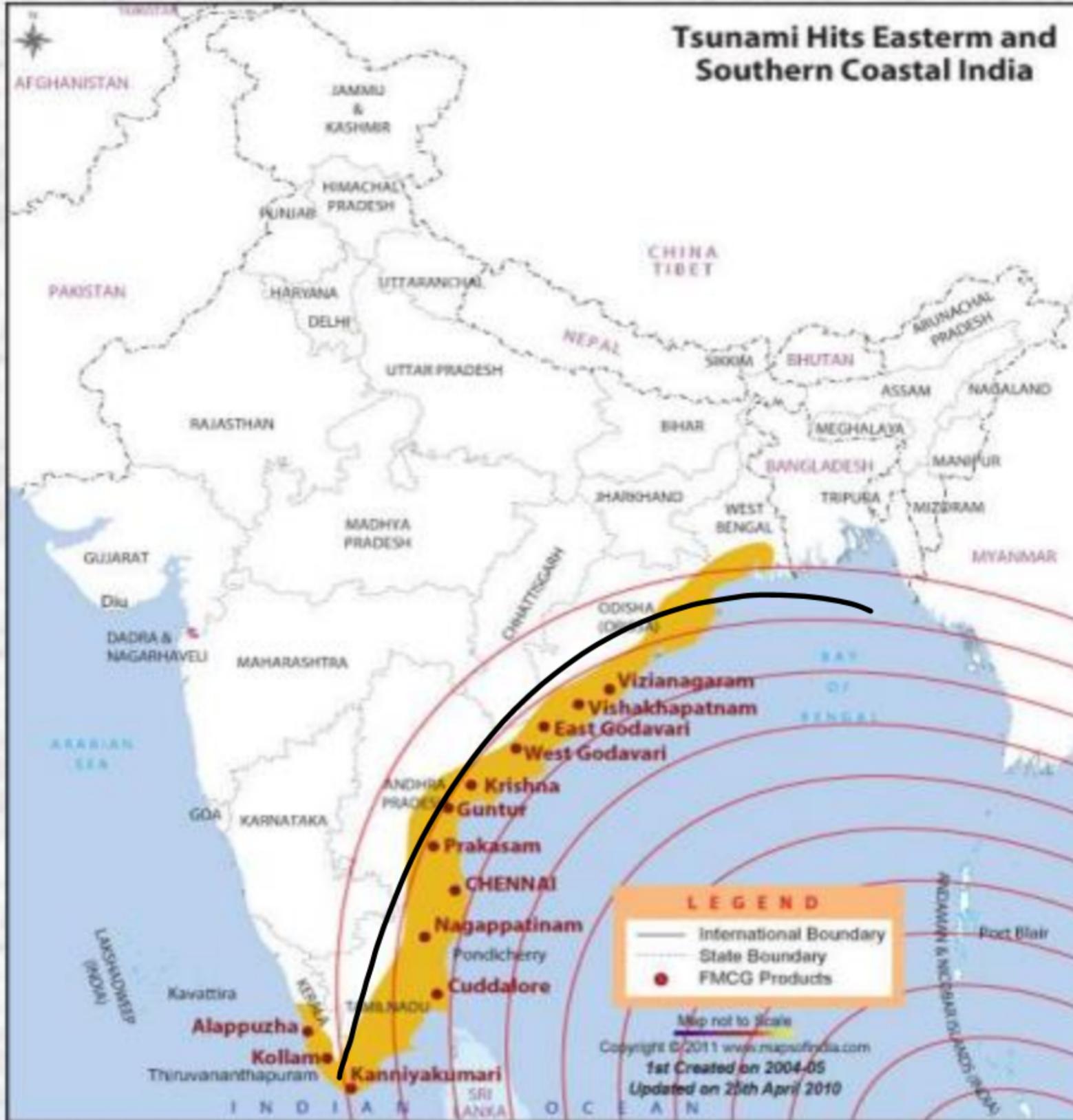
## Impact of Tsunami in India

The Tsunamis have caused extensive damage in Andaman and Nicobar Islands, Andhra Pradesh, Kerala, Tamil Nadu and Pondicherry. The official death toll has been put at 9675 (10.00 hrs, Jan. 5) and is expected to go up after further details from Nicobar Islands are received



Source: Ministry of Home Affairs

KBK Infographics



2004

10,000



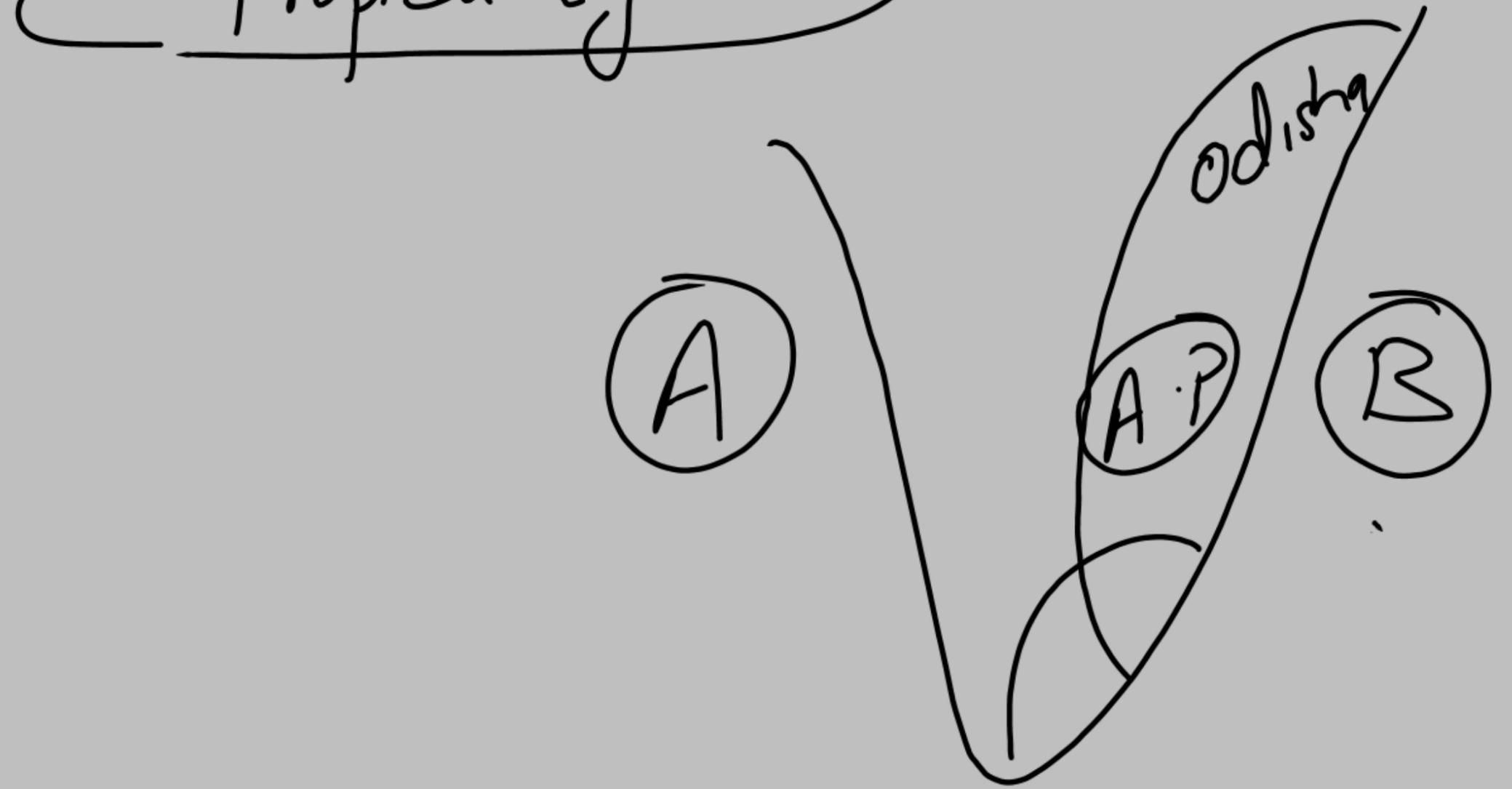
# Tropical cyclone

A

A.P

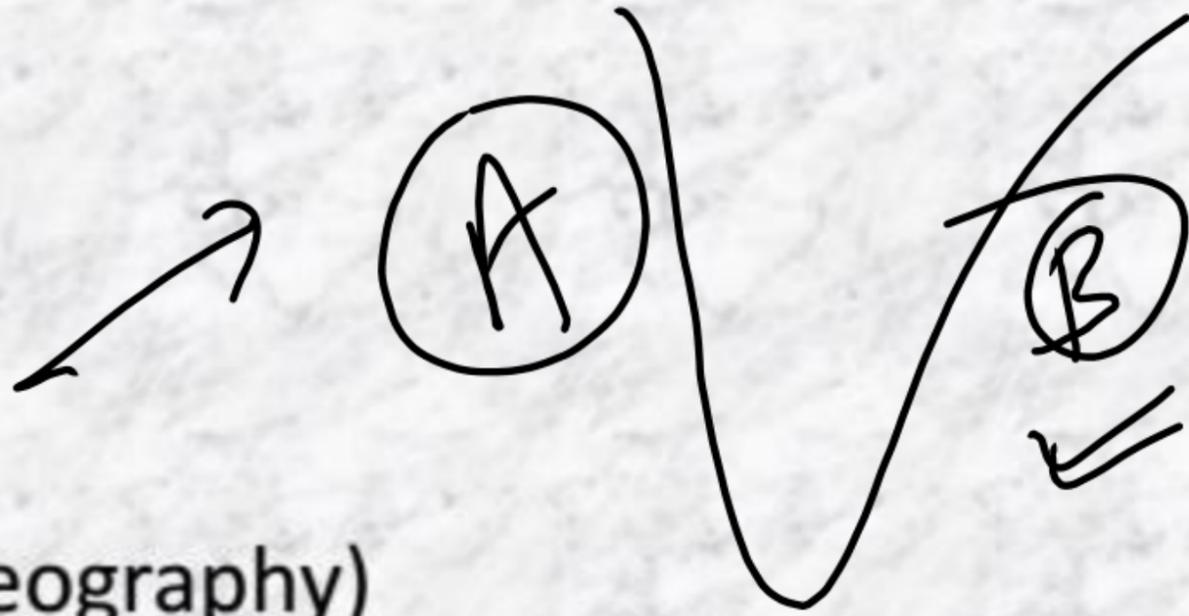
B

Odisha



# Cyclone as a Disaster

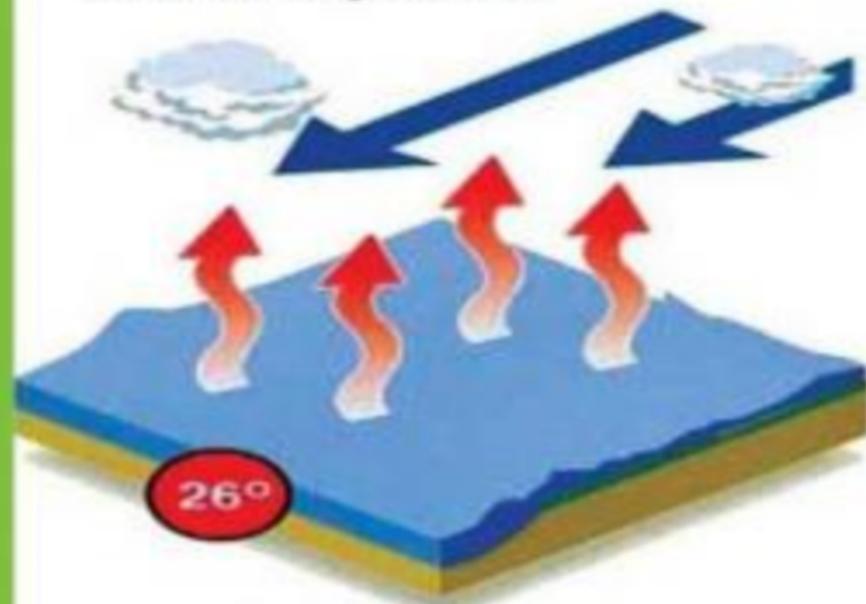
- Where do Cyclones Originate?
- How do Cyclones Originate? (Geography)
- Vulnerability of India
- Impact of cyclones
- Management



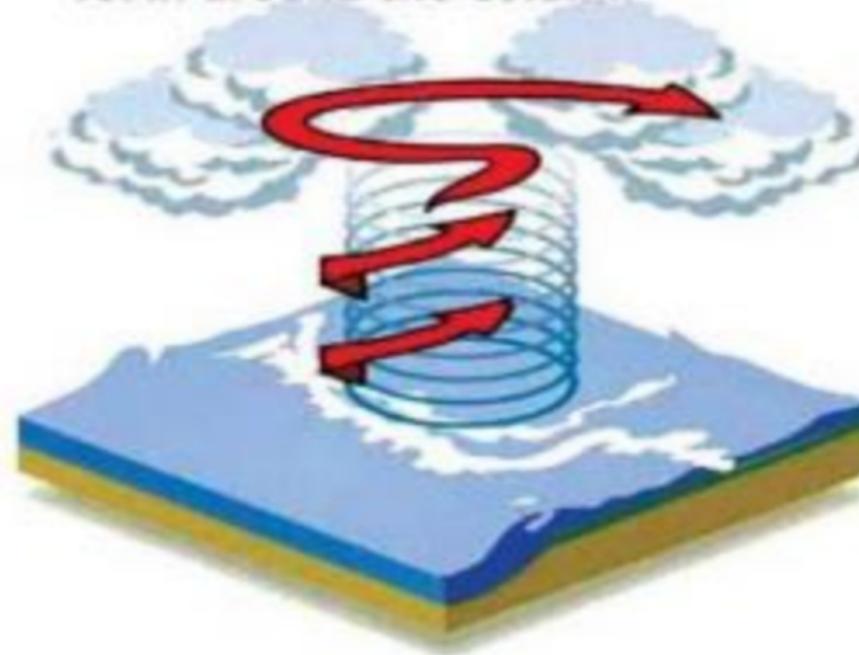
## HOW TROPICAL STORMS ARE FORMED

High humidity and ocean temperatures of over 26°C are major contributing factors

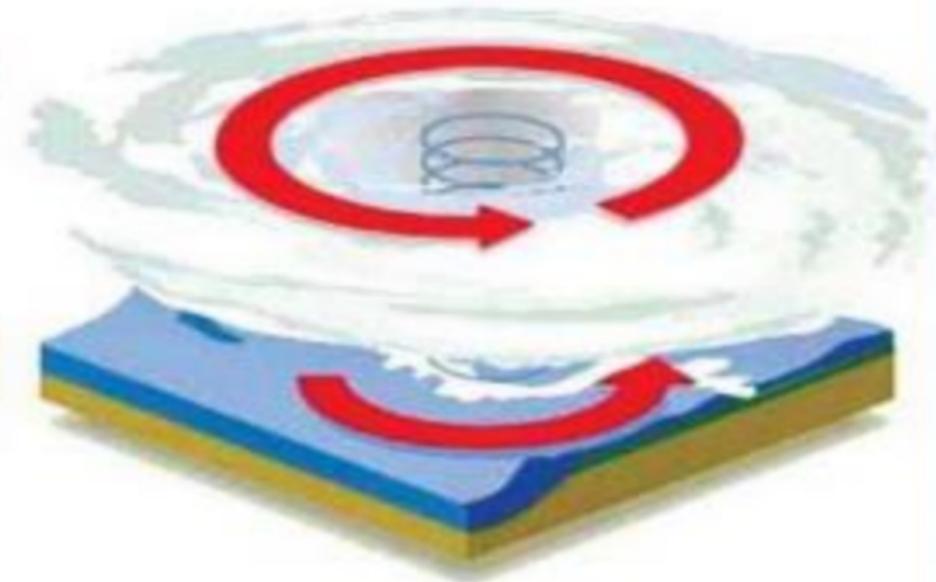
Water evaporates from the ocean surface and comes into contact with a mass of cold air, forming clouds



A column of low pressure develops at the centre. Winds form around the column



As pressure in the central column (the eye) weakens, the speed of the wind around it increases



### Saffir-Simpson hurricane wind scale

**CATEGORY 1**

Minimal damage



**Winds**  
119-153 kph

SOURCE: NHC

**CATEGORY 2**

Moderate damage



**Winds**  
154-177 kph

**CATEGORY 3**

Extensive damage



**Winds**  
178-208 kph

**CATEGORY 4**

Extreme damage



**Winds**  
209-251 kph

**CATEGORY 5**

Catastrophic



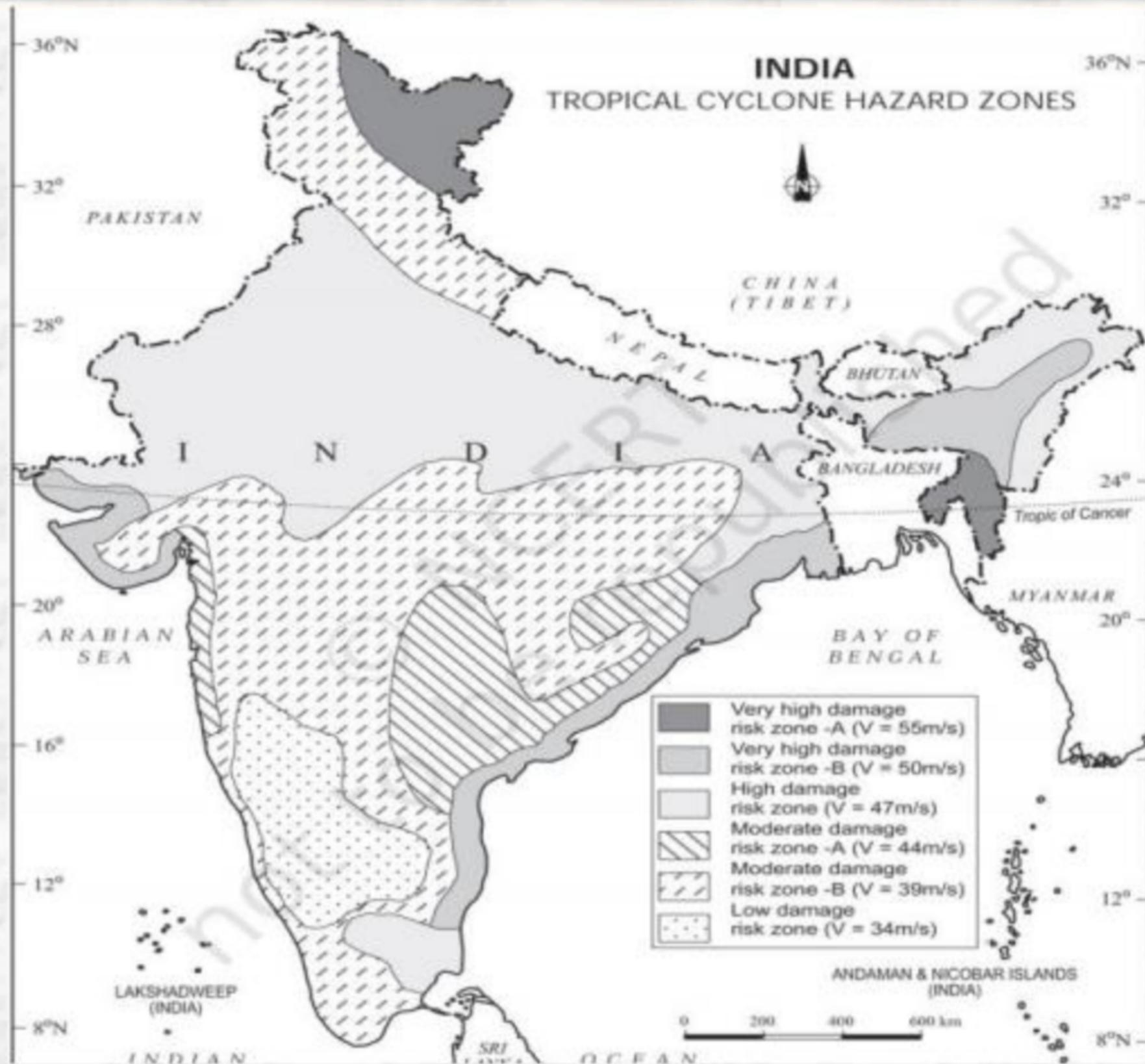
**Winds**  
252 kph and more

# IMD Classification

- **Depression:** Winds up to 51 kmph.
- **Deep Depression:** Winds between 52 and 61 kmph.
- **Cyclonic Storm:** Winds between 62 and 88 kmph.
- **Severe Cyclonic Storm:** Winds between 89 and 117 kmph.
- **Very Severe Cyclonic Storm:** Winds between 118 and 166 kmph.
- **Extremely Severe Cyclonic Storm:** Winds between 167 and 221 kmph.
- **Super Cyclonic Storm:** Winds exceeding 221 kmph.

# Vulnerability

- About 5,700 km of the India's coastline encompassing 84 Coastal districts (**roughly 8% of the geographical area**) in **13 Coastal States and Union Territories (UTs)** are affected by severe tropical cyclones year after year.
- Approximately **40% of India's population is living within 100 km of the coastline.**



# Vulnerability

- 1977 Cyclone - 10,000 death Andhra Pradesh
- 1990 Super Cyclone - 967 people in Andhra Pradesh
- 1996 Very Severe Cyclonic Storm with a fatality of 1,057 people in Andhra Pradesh
- 1999 Super Cyclone - Odisha with a fatality of about 10,000 people, destroying 275,000 homes and leading to 1.67 million homeless.
- October 12 2013 Cyclone Phailin hit the states of Odisha and Andhra Pradesh with maximum sustained wind gusting up to 220 km per hour, heavy rains measuring up to 25 cm and storm surge over 3 m; the sea pushed in as much as 40 m along parts of the coast.
- Affecting about 13.2 million people in 171 blocks in 18 Districts of the state, and resulting in 44 human casualties.
- It was the strongest cyclone to hit the Indian coast, similar to the Super Cyclone of 1999 which hit Odisha.



# KHAN GLOBAL STUDIES

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**THANKS FOR WATCHING**

