Devastating Earthquake Strikes Afghanistan

Source: IE

Afghanistan was struck by a **6.0-magnitude earthquake**, killing over **800 people** highlighting the country's extreme vulnerability to seismic hazards.

Afghanistan Vulnerability to Seismic Hazards

- Afghanistan is one of the most earthquake-prone countries due to its location at the **collision zone of the Indian and Eurasian tectonic plates.**
    - Many quakes in Afghanistan are **shallow,** releasing high energy at the surface, causing severe damage.
- **Major Earthquake Zones:**
    - **Hindu Kush (Northern Afghanistan):** Known for both shallow and deep-focus quakes due to the sinking of the Indian Plate's lithosphere.
        - The **Hindu Kush region** (spans Afghanistan, Bangladesh, Bhutan, China, India, Nepal, Myanmar and Pakistan)**,** forms part of the **Alpide Belt,** the world's second most seismically active zone after the **Circum-Pacific Belt.**
        - Since 1900, Hindu Kush region has experienced 12 earthquakes above magnitude 7, underscoring its high seismic activity.
    - **Sulaiman Range (Southeastern Afghanistan & Western Pakistan):** Characterized by destructive shallow, thrust fault quakes.
- **Active Fault Systems: Faults** like the **Chaman Fault and Main Pamir Thrust (or Pamir Frontal Thrust)** are major sources of seismic activity in Afghanistan.

Afghanistan

- It is a landlocked, multi-ethnic country in **South-Central Asia**. Its capital is Kabul, and it shares borders with **Pakistan, India, Iran, Turkmenistan, Uzbekistan, Tajikistan, and China**.
- The **Hindu Kush mountains** dominate its terrain, with passes like Khyber and Shebar.

Fault lines crossing Afghanistan

EARTHQUAKE

ABOUT

- Shaking of the earth; caused due to release of energy, generating seismic waves in all directions

HYPOCENTER

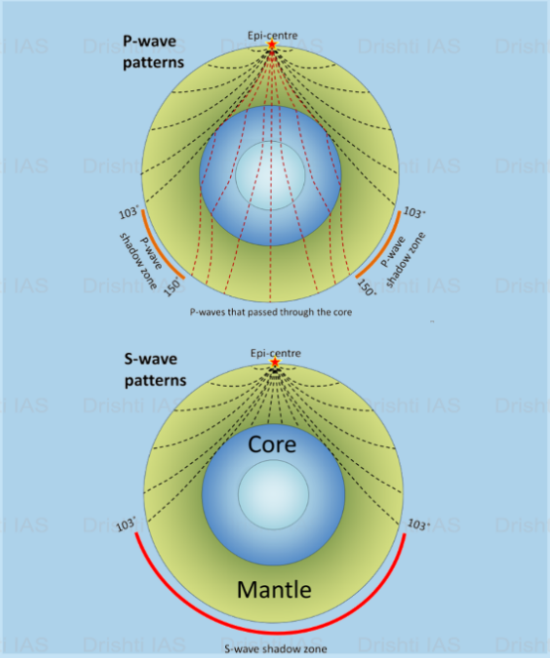
- Location where the earthquake starts (below earth's surface)

EPICENTER

- Location right above the Hypocenter (on the earth's surface)

EARTHQUAKE WAVES

- Body Waves: Move in all directions travelling through the body of the earth
  - P Waves: Move faster, First to arrive at surface, Similar to sound waves, Travel through gaseous, liquid and solid materials
  - S Waves: Arrive at surface with some time lag, Travel only through solid materials
- Surface Waves: Last to report on seismographs, More destructive, Cause displacement of rocks
  - Love Waves: Same motion as S-waves (horizontal) without vertical displacement, Sideways motion perpendicular to the direction of propagation, Faster than Rayleigh waves
  - Rayleigh Waves: Cause the ground to shake in an elliptical pattern, Spread out the most of all seismic waves, Move vertically and horizontally in a vertical plane



CAUSES OF EARTHQUAKES

- Release of energy along a Fault/Fault Zones (break in the crustal rocks)
- Movement of tectonic plates (most common)
- Volcanic eruption (stress changes in rock-injection/withdrawal of magma)
- Human activities (mining, explosion of chemical/nuclear devices etc.)

MEASURING EARTHQUAKE

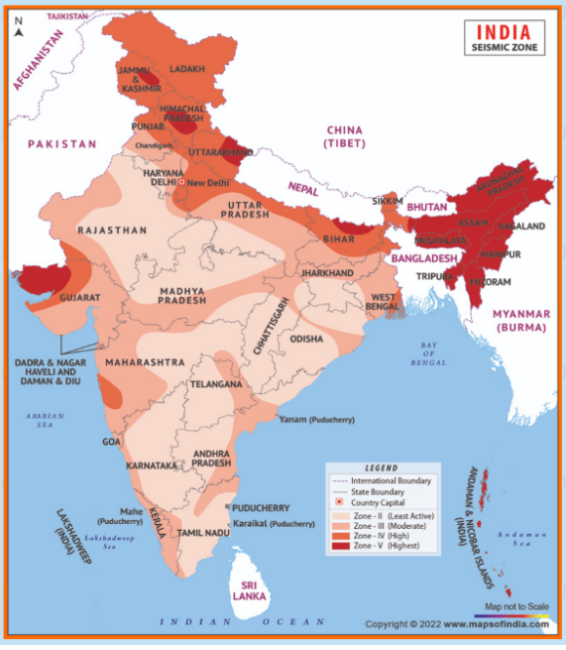
- Seismometers - Measures seismic waves
- Richter Scale - Measures magnitude (energy released; range: 0-10)
- Mercalli - Measures intensity (visible damage; range: 1-12)

DISTRIBUTION

- Circum-Pacific Belt - 81% of earthquakes
- Alpide Earthquake Belt - 17% of the largest earthquakes
- Mid-Atlantic Ridge - Mostly submerged underwater

EARTHQUAKE IN INDIA

- India is one of the highly earthquake affected countries due to the presence of technically active mountains - the Himalayas.
- India has been divided into 4 seismic zones (II, III, IV, and V)



Drishti IAS

Read more: Earthquake