

3.7 Magnitude of Earthquake in Rajasthan

Why in News?

According to the <u>National Center for Seismology</u>, an <u>Earthquake</u> of magnitude 3.7 shook Pali, Rajasthan, recently.

Key Points

- An earthquake in simple words is the shaking of the earth. It is a natural event. It is caused due to release of energy, which generates waves that travel in all directions.
- The vibrations called seismic waves are generated from earthquakes that travel through the Earth and are recorded on instruments called seismographs.
- Types of Earthquakes: Fault Zones, Tectonic Earthquakes, Volcanic Earthquake, Human Induced Earthquakes.
- Earthquake in India:
 - India is one of the highly earthquake affected countries because of the presence of technically active young fold mountains - Himalaya.
 - India has been divided into **four seismic zones** (II, III, IV, and V) based on scientific inputs relating to seismicity, earthquakes that occurred in the past and tectonic setup of the region.

EARTHQUAKE

ABOUT

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

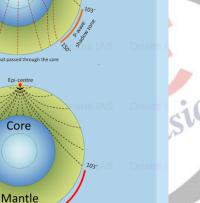
Location where the earthquake starts (below earth's surface)

HYPOCENTER

EPICENTER

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

P-wave patterns S-wave patterns Core



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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 rockinjection/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





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