

## Earthquakes

## Why in News?

Recently the National Capital Region, Delhi and adjoining regions faces a shallow earthquake of 4.0 magnitude with a focal depth of five kilometres.

- An earthquake is a phenomenon that occurs without warning and involves <u>violent</u> <u>shaking of the ground</u> and everything over it.
- It results from the release of accumulated stress of the moving lithospheric or crustal plates.
- An earthquake is the sudden movement of Earth's crust at a fault line.
- It is also called as quakes, tremors, or temblors.
- **Epicenter** The location where an earthquake begins is called the epicenter. An earthquake's most intense shaking is often felt near the epicenter.
- However, the vibrations from an earthquake can still be felt and detected hundreds, or even thousands of miles away from the epicenter.
- The energy from an earthquake travels through Earth in vibrations called seismic waves, measured by seismometer.
- Types of energy

P waves or primary waves	<ul> <li>These are the first waves to be detected.</li> <li>These are compressional waves that push and pull as they move through rock and fluids.</li> </ul>
S waves or secondary waves	<ul> <li>These are the second waves to be detected.</li> <li>These waves move <u>only through rock.</u></li> <li>They move up and down or side to side, perpendicular to the direction in which the wave is moving.</li> </ul>
Surface waves	<ul> <li>It follows P and S waves.</li> <li>They travel along the surface of the earth and thus cause the most damage.</li> <li>Surface waves can be characterized as Love waves, which are faster and move the ground from side to side.</li> </ul>

- **Types Of Earthquake** Along with the tectonic earthquakes, there are also 3 types of earthquakes.
  - $\circ~\textbf{Volcanic}$  Earthquakes that occur in conjunction with volcanic activity
  - $\circ~$  Collapse Smaller-scale earthquakes that result from the subterranean collapse of caverns or mines
  - Explosion Earthquakes caused by underground explosions of nuclear or chemical devices.
- Depth
  - $\circ\,$  Shallow earthquakes 0 to 70 km deep
  - Intermediate earthquakes 70 to 300 km deep.

• **Deep earthquakes** - 300 to 700 km deep.

- Scenario in Delhi Delhi lies in the <u>Aravalli-Delhi Fold Belt</u>, a seismically-active geological belt extending from southern and eastern Rajasthan to Haryana and Delhi.
- Over the years, the tectonic activity in the region has slowed down considerably, leading to greater geological stability. But some faults still remain, which give rise to occasional mild earthquakes.
- **Medvedev-Sponheuer-Karnik scale** It is a *measure of intensity*, rather than strength, or energy released, which is described by magnitude.
- Delhi is classified in **Zone 4**, the 2<sup>nd</sup> highest classification of areas based on their susceptibility to shaking experienced during an earthquake.

## References

- 1. The Hindu | What is a shallow earthquake?
- 2. <u>News 18 | What Is an Earthquake?</u>

