4. Afghanistan Earthquake - International Relations

A recent 6.0 magnitude earthquake in Afghanistan, caused by the collision of the Indian and Eurasian tectonic plates, resulted in over 800 deaths. The high casualty rate was exacerbated by the quake's shallow depth and the collapse of poorly constructed mud-brick buildings.

Context - The Afghanistan Earthquake

The Event - A recent earthquake with a 6.0 magnitude struck Afghanistan.

Impact - The quake resulted in a high number of casualties, with over 800 deaths and 2,000 injuries reported.

Key Factors - The severe damage and loss of life were largely attributed to two main factors - the earthquake's shallow depth and the poor quality of building structures in the affected region.

Earthquake

Core Definition - An earthquake is the shaking of the ground that occurs when two blocks of the earth's crust slip past one another along a crack known as a fault.

Energy Release - This sudden movement releases immense stored elastic strain energy. This energy radiates outwards from the fault in the form of seismic waves, which cause the ground to shake.

Key Terminology -

1. **Hypocenter -** The location *beneath* the Earth's surface where the earthquake originates.
2. **Epicenter -** The point on the Earth's surface *directly above* the hypocenter, where the shaking is typically strongest.

Measurement -

1. **Richter Scale -** This scale is used to measure the magnitude of an earthquake, which is a measure of the total energy released at the hypocenter.
2. **Mercalli Scale -** This scale measures the intensity of an earthquake, which is determined by the visible damage and the effects felt by people at a specific location.

Reasons for Earthquakes in Afghanistan

1. **Tectonic Plate Collision -** The region, which includes the Himalaya and Hindu Kush mountains, is highly seismically active. This is due to the constant friction caused by the collision of the Eurasian and Indian tectonic plates.
2. **Movement of the Indian Plate -** The Indian Plate is continuously pushing northward into the Eurasian Plate at a rate of approximately 5 cm per year. This relentless movement exerts immense pressure, creating numerous fault lines across Afghanistan, Pakistan, and northern India.
3. **Shallow Depth of the Recent Quake -** The recent earthquake was particularly destructive because its hypocenter was very shallow, located only about 8 km deep. A shallow earthquake releases its energy closer to the surface, which significantly amplifies the ground shaking and the resulting damage.

Impact of Earthquakes

Primary Destructive Effects - Earthquakes cause large-scale casualties and destruction through several direct and indirect effects, including -

1. **Collapsing buildings**
2. **Landslides**
3. **Tsunamis** (if the quake occurs under the sea)
4. **Fires** (triggered by broken gas lines and electrical wires)

Social and Psychological Consequences

Earthquakes often lead to the mass displacement of people, leaving them homeless. They cause the loss of community structures and social cohesion. Survivors commonly experience severe and lasting psychological trauma.

Specific Factors in the Afghanistan Quake -

1. **Shallow Depth -** The shallow origin of the quake intensified the ground shaking, leading to more widespread destruction.
2. **Fragile Construction -** In rural Afghanistan, buildings are often constructed from mud-brick and stone without modern engineering standards. These materials make the structures brittle and extremely prone to collapse during an earthquake.

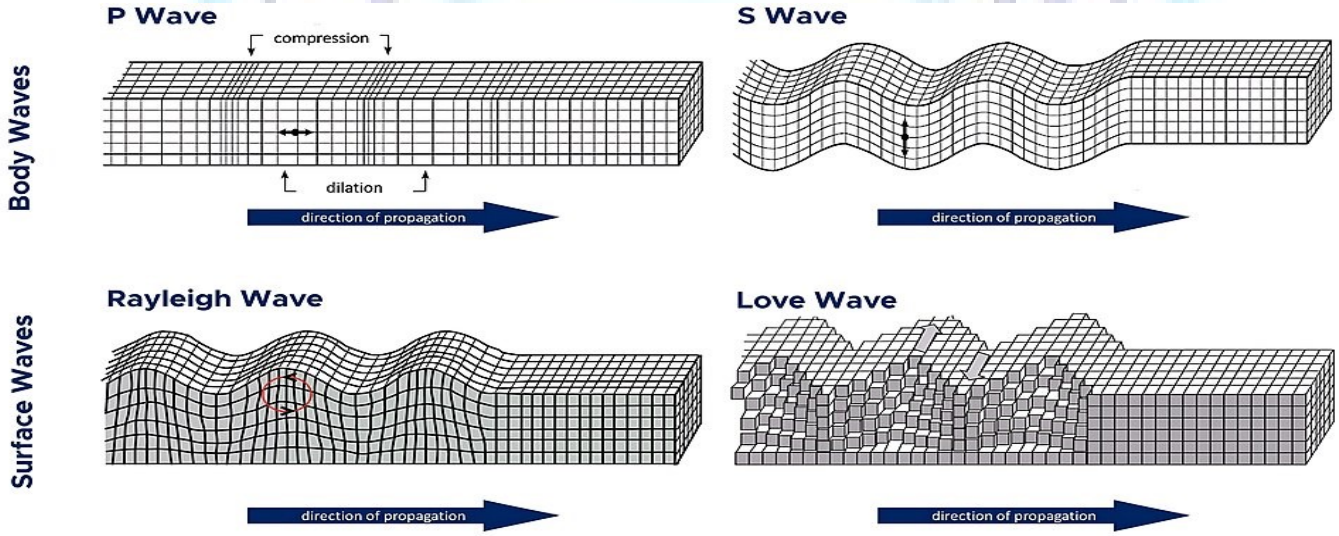
Understanding Seismic Waves

Definition - Seismic waves are the waves of energy that are generated by an earthquake. They travel through the Earth's layers, and it is their movement that causes the ground to shake.

Main Types of Seismic Waves -

1. **Body Waves -** These waves travel through the interior (the "body") of the Earth. They are faster than surface waves.
2. **Surface Waves -** These waves are confined to travel along the Earth's surface. Although they are slower than body waves, they have a larger amplitude (movement) and are responsible for the most damage during an earthquake.

Types of Body Waves



1. **P-Waves (Primary Waves) -**
    1. **Speed and Arrival -** They are the fastest of all seismic waves and are the first to be detected by seismographs.
    2. **Motion -** They are compressional or longitudinal waves, meaning they cause particles to move back and forth in the same direction that the wave is travelling (like a Slinky spring).
    3. **Medium -** P-waves can travel through solids, liquids, and gases.
2. **S-Waves (Secondary Waves) -**
    1. **Speed and Arrival -** They are slower than P-waves and arrive second.
    2. **Motion -** They are transverse waves, meaning they cause particles to move up and down or side-to-side, perpendicular to the direction the wave is travelling.
    3. **Medium -** S-waves can only travel through solids. They cannot propagate through liquids or gases because these materials do not have the shear strength to support their motion.

Source - https - //www.downtoearth.org.in/natural-disasters/why-was-the-afghanistan-earthquake-so-deadly-a-disaster-resilience-expert-explains