

Earthquake in Morocco

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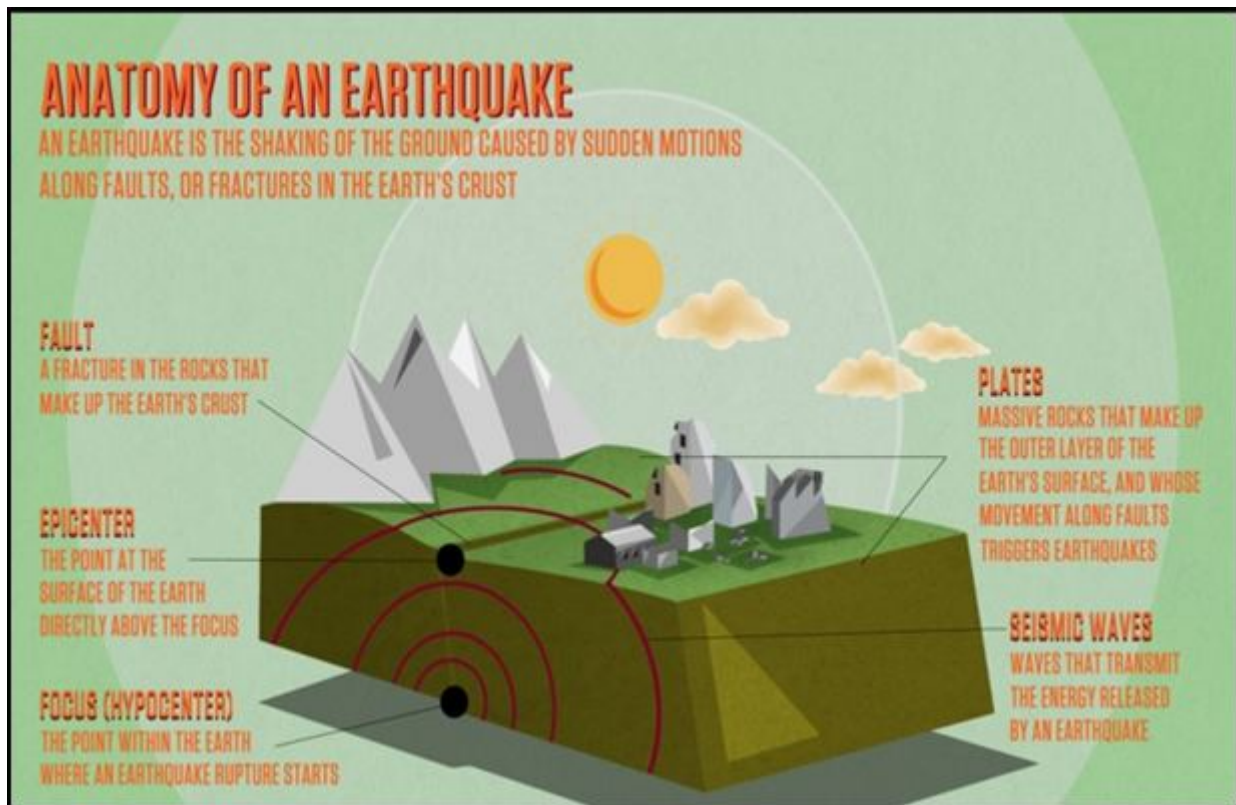
What's in today's article?

- **Why in news?**
- **What is an Earthquake?**
- **News Summary: Earthquake in Morocco**
- **Where did the quake hit?**
- **Why the Morocco quake occurred?**
- **What is oblique-reverse faulting?**

Why in news?

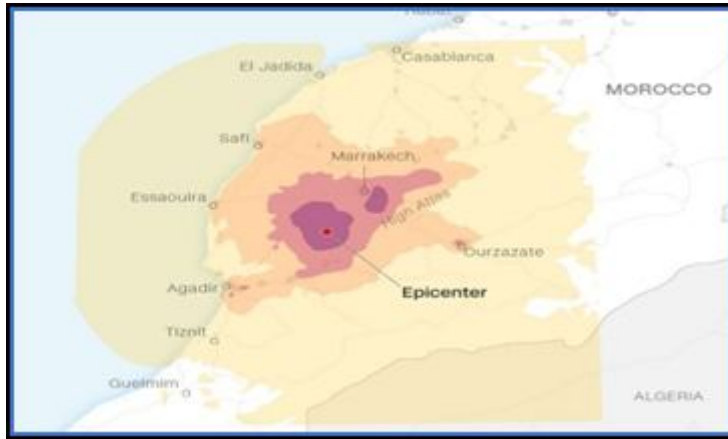
- A rare, powerful earthquake struck Morocco on September 8 night, killing hundreds of people and damaging buildings, including in the historic city of Marrakech.
 - **Marrakech is a UNESCO World Heritage Site.**
- So far, more than 2000 people have died, mostly in Marrakech and five provinces near the quake's epicentre.

What is an Earthquake?



- An earthquake is **an intense shaking of the ground** caused by movement under the earth's surface.
 - The location below the earth's surface where the earthquake starts is called the
 - The location directly above the hypocentre on the surface of the earth is called the **epicentre**.
- It happens when **two blocks (tectonic plates) of the earth suddenly slip** past one another releasing stored-up 'elastic strain' energy in the form of seismic waves.
- These **spread through the earth** and cause the shaking of the ground.
- They are measured on scales called the –
 - **Moment Magnitude Scale (Mw)**, based on the total moment (a product of the distance a fault moved and the force required to move it) release of the earthquake.
 - The **Richter** scale (magnitude scale) – energy released – 0-10.
 - The intensity scale/**Mercalli** scale – visible damage – 1-12.
- Earthquakes continue to remain the most common natural hazard that **cannot be predicted** as no early warning systems can be developed.

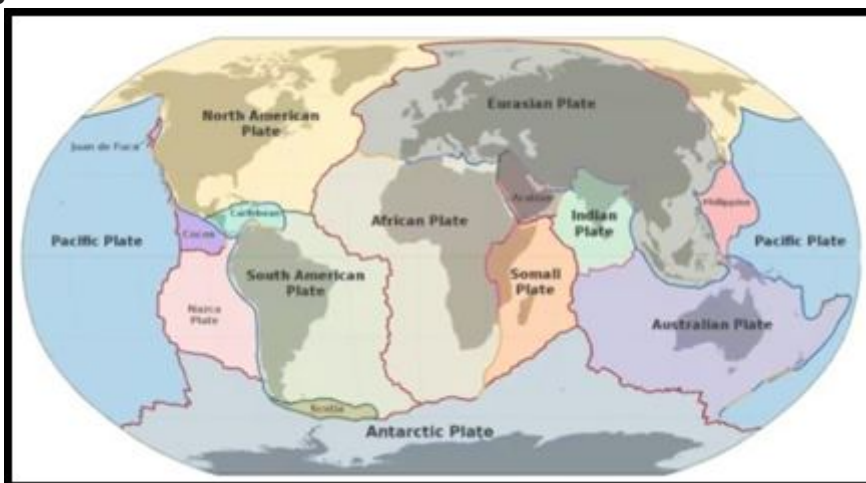
News Summary: Earthquake in Morocco



- The epicentre of the earthquake was located in the **High Atlas Mountain range**, about 72 kilometers from Marrakech.
- The quake had a **magnitude of 6.8**, meaning it is classed as “strong.” It also struck at a relatively shallow depth, making it more destructive.
 - As per the US Geological Survey (USGS), the focus was 18.5 km below the Earth’s surface, though Morocco’s own seismic agency pegged the depth at 11 km.
 - Either way, it was a fairly shallow quake.
- Such quakes are generally more dangerous as they carry more energy to the surface, when compared to quakes that occur deeper underneath the surface.
 - While deeper quakes do indeed spread farther as seismic waves move radially upwards to the surface, they lose energy while travelling greater distances.
- Earthquakes of this size in the region are uncommon, according to the US Geological Survey, but not unexpected.
 - Nine quakes with a magnitude of 5 or higher have hit the area since 1900, but none of them have had a magnitude higher than 6.

Why the Morocco quake occurred?

• Background



- While seismicity rates are indeed lower in the region, making earthquakes rarer, they are not completely unheard of.

- According to the USGS, large destructive earthquakes have been recorded and reported from Morocco in the western Mediterranean.
- Such quakes occur due to the northward convergence of the African plate with respect to the Eurasian plate along a complex plate boundary.

- **Reasons behind Morocco quake**

- With respect to Morocco's quake, the USGS attributed it to **oblique-reverse faulting** at shallow depth within the Moroccan High Atlas Mountain range.

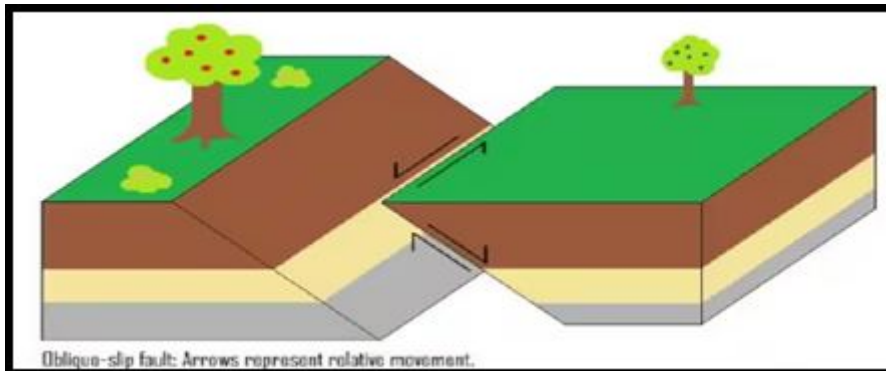
What is oblique-reverse faulting?

- **Fault**

- A fault is a fracture or zone of fractures between two blocks of rock.
- Faults allow the blocks to move relative to each other, causing earthquakes if the movement occurs rapidly.
- During a quake, the rock on one side of the fault suddenly slips with respect to the other.

- **Different types of faults**

- Scientists use the angle of the fault with respect to the surface (known as the dip) and the direction of the slip along the fault to classify faults.
- Faults which move along the direction of the dip plane are **dip-slip faults**, whereas faults which move horizontally are known as **strike-slip faults**.
- **Oblique-slip faults** show characteristics of both dip-slip and strike-slip faults.
- The term **reverse** refers to a situation that the upper block, above the fault plane, moves up and over the lower block.



- **Oblique-reverse faulting**

- It is also known as oblique-thrust faulting.
- It is a type of geological faulting in which rocks on one side of the fault plane move vertically and horizontally in response to compressional forces.
- This type of faulting is common in **areas of compression** — when one tectonic plate is converging into another.

Q1) What is Atlas Mountain Range?

The Atlas Mountains are a prominent mountain range in North Africa, stretching across Morocco, Algeria, and Tunisia.

Q2) What is a tectonic plate?

A tectonic plate is a massive, rigid slab of rock that makes up a significant portion of the Earth's outer shell, known as the lithosphere. These plates are the fundamental building blocks of the Earth's crust and uppermost mantle, and they cover the entire surface of our planet. Tectonic plates vary in size but can be as large as entire continents or smaller, covering portions of continents or ocean basins.

Source: [Why the earthquake in Morocco has caused so much damage](#) | [CNN](#) | [Indian Express](#)

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