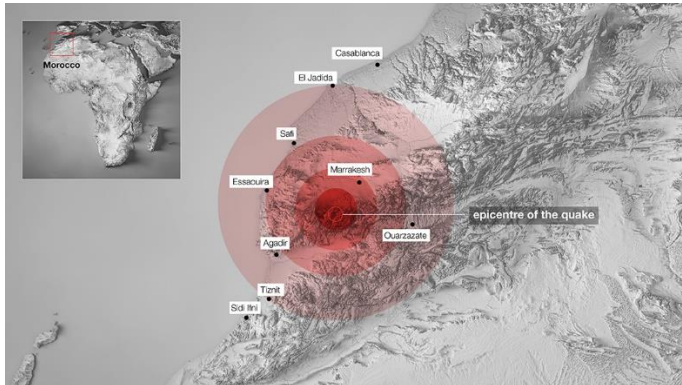


Morocco Earthquake 2023

The earthquake and its impacts

On Friday 8 September, Morocco was struck by a powerful magnitude 6.8 earthquake. The epicentre was in the High Atlas Mountain range, about 72 km (44 miles) southwest of Marrakech, in the province of Al Haouz. The earthquake was felt as far away as Casablanca and Fez, about 480km (300 miles) north-east of Marrakech. There have been several powerful aftershocks.

The epicentre of the earthquake



(Source: British Red Cross)

The British Red Cross (15/9/23) estimates that over 2,800 have been killed and 5,600 people have been injured. An estimated 300,000 people have been affected by the earthquake.

Whilst Marrakech suffered some damage from the earthquake, the greatest impacts were felt in the many remote mountain villages in Al Haouz province. Some villages close to the epicentre have been completely destroyed, including Tafeghaghte, 37 miles from Marrakech.

“Thousands of homes have been destroyed, displacing families, and exposing them to the elements at a time of year when temperatures drop down during the nighttime. Schools, hospitals and other medical and educational facilities have been damaged or destroyed by the quakes, further impacting children.” UNICEF

Damage to buildings in the High Atlas Mountains



(Source: Moroccan Red Cross)

The tectonic background

Morocco lies on the northern edge of the African tectonic plate close to the very complex collision boundary with the Eurasian plate. The African plate is moving northwards and colliding with the Eurasian plate crumpling the crust to create the High Atlas Mountains.

Whilst the actual plate margin is some 500 km to the north of Marrakech – running roughly west-east through the Mediterranean – the northern edge of the African plate is tectonically highly complex, comprising the Morocco and Iberia microplates and numerous faults in the area. It is likely that compressional movement between the two microplates along a reverse fault triggered the recent earthquake.

[A level students will find it fascinating to explore the tectonic complexity of this region]

See <https://www.washingtonpost.com/world/2023/09/11/morocco-earthquake-cause-geological-map/> for some excellent diagrams and maps

Factors contributing to the disaster

Several factors have contributed to the impacts of the earthquake:

- *Magnitude and depth.* A 6.8 magnitude earthquake is extremely powerful and its shallow depth (18.5km) triggered highly destructive high-energy, high amplitude surface seismic waves that were particularly destructive.
- *Time of earthquake.* The earthquake occurred just after 11pm at night when most people were in their homes asleep. At this time, the most vulnerable people were those in the High Atlas Mountains living in mud-brick buildings not designed to withstand earthquakes. Those people living in modern, well-built houses would have been safer.
- *Remote villages.* Many people in the High Atlas Mountains live in remote villages with tenuous road communications and limited access to services. Landslides and rockfalls blocked many access roads for several days preventing emergency services from gaining access. Electricity supplies and telecommunications were cut off for several days.
- *Lack of preparedness.* Whilst earthquakes do occur in Morocco (1960, 12,000 died in Agadir and in 2004, 600 died in the northern Rif region) the High Atlas Mountains region has not been affected by a major earthquake in recent times. As a result, most buildings in remote villages were not earthquake-resistant and simply collapsed when shaken. The earthquake hazard was not a daily concern to people, most of whom are involved in low-income agriculture and have limited resources. This is a poor part of Morocco.

Responses

After the earthquake struck, many people who were not trapped inside collapsed buildings congregated in open areas. In towns and cities, nearby emergency services supported people providing basic needs such as water, food and temporary shelters. In the more remote mountain villages, cut off from emergency services and aid workers, the immediate responses involved the local community only.

In the days after the earthquake, search and rescue teams from Morocco and elsewhere were deployed to search for people trapped in collapsed buildings. Few were found alive. Charities and aid organisations such as the Moroccan Red Cross supported search and rescue and provided medical help and psychosocial support.

The priorities in the early days involved search and rescue, re-establishing road connections to villages cut off by landslides and rockfalls, re-connecting services such as electricity and telecommunications and providing basic needs (water, food, medical aid and shelter) for those people left homeless.

In the weeks and months to come – when this story is no longer hitting the headlines – there will be huge challenges for the government and for local communities, re-building homes and infrastructure and helping people to re-build their lives.

Selective links

<https://edition.cnn.com/africa/live-news/morocco-earthquake-marrakech-09-11-23/index.html>

<https://earthquake.usgs.gov/earthquakes/eventpage/us7000kufc/executive>

<https://www.nationalgeographic.com/science/article/what-made-the-earthquake-in-morocco-so-devastating>

<https://www.arabnews.com/node/2370701/world>

<https://www.washingtonpost.com/world/2023/09/11/morocco-earthquake-cause-geological-map/>

<https://www.reuters.com/graphics/MOROCCO->

[QUAKE/CONSTRUCTION/xmpjlblojpr/#:~:text=The%20earthquake%20causes%20violent%20lateral,for%20days%20after%20the%20quake](https://www.reuters.com/graphics/MOROCCO-QUAKE/CONSTRUCTION/xmpjlblojpr/#:~:text=The%20earthquake%20causes%20violent%20lateral,for%20days%20after%20the%20quake)