

# WHY TURKEY IS PRONE TO DEVASTATING EARTHQUAKES?

Relevant for: Geography | Topic: Important Geophysical phenomena - Earthquakes, Tsunamis & Volcanoes

To enjoy additional benefits

CONNECT WITH US

February 06, 2023 05:30 pm | Updated February 07, 2023 10:26 am IST

COMMENTS

SHARE

READ LATER

People walk next to buildings destroyed by an earthquake in Malatya, Turkey, Monday, Feb. 6, 2023. | Photo Credit: AP

Three earthquakes measuring -- 7.8, 7.6, and 6.0 -- magnitude on the Richter scale has devastated Turkey and Syria, while the impacting regions as far away as Cyprus (456 km away), Lebanon (874 km), Israel (1,381 km) and Egypt (1,411 km). The tremors of the first quake were felt on February 6 around 4 a.m., with the epicentre located near the city of Gaziantep in south-central Turkey, which houses more than two million people. This population also includes scores of Syrian refugees who fled the raging civil war after 2011. [At least 40 aftershocks](#) followed the first quake, according to Turkish authorities, with some of magnitude as high as 6.7. Two more earthquakes -- of 7.6 and 6.0 magnitude -- struck the region nine hours later. This is the strongest earthquake to shake the region in more than 100 years and has killed [at least 3,800 people](#) across Turkey and Syria as of Tuesday morning, according to officials.

More than 2,000 people are feared injured, and several remain trapped under rubble. Turkey has announced a Level 4 alert calling for international aid; U.S., European Union, Russia, and Azerbaijan have reportedly dispatched aid. The extent of the destruction is still playing out: rescue workers are searching under the wreckage, with haunting visuals of children and adults being pulled out from under the debris being shared online. Rescue efforts are complicated by Turkey's rainy and freezing weather, and Syria's decade-long civil war that has displaced millions of people.

The quake's focus was 18 km deep, according to the U.S. Geological Survey. The epicentre was about 33 km from Gaziantep. The area has many buildings constructed of brittle concrete (which makes them prone to cracking, spalling, loss of strength, or steel corrosion), making them "extremely vulnerable to earthquake shaking", according to the USGS.

Nearly 900 buildings were reportedly destroyed in Turkey's Gaziantep and Kahramanmaraş provinces, according to Vice President Fuat Oktay. All buildings located on the cross-border belt connecting the Syrian cities of Aleppo and Hama to Turkey's Diyarbakir crumbled as well. This was "historically, the biggest earthquake recorded in the history of the centre", the head of Syria's National Earthquake Center, Raed Ahmed, told local media.

Images show heavy damage to roads, buildings, cars, shopping malls, and airports. Such was the intensity of the quake that the runway at Turkey's Hatay Airport was [torn open](#). At least 10 cities have been affected by the earthquake in Turkey itself, [according to officials](#), with destruction borne by more than 2,818 buildings. The historic 2,200-year-old stone castle sitting atop a hill in the centre of Gaziantep – its most famous landmark which was used as an observation point during Roman times – has been damaged, with its walls and watch towers disintegrated. One of the most prominent sites in Maltaya, the famous Yeni Mosque which dates back to the 13<sup>th</sup> century, had collapsed.

Turkey is frequently shaken by earthquakes. In 2020 itself, it recorded almost 33,000 earthquakes in the region, according to Disaster and Emergency Management Authority (AFAD). Out of these, 332 earthquakes were of magnitudes 4.0 and higher.

Turkey's proneness to earthquakes comes from its tectonic location. The Earth's outermost layer comprises of some 15 major slabs, called tectonic plates. The boundaries between these plates are a system of faults – fractures between two blocks of rocks. Any sudden movement along these faults can cause earthquakes, [according](#) to the British Archaeological Survey.

Turkey is located on the [Anatolian tectonic plate](#), which is wedged between the Eurasian and African plates. On the north side, the minor Arabian plate further restricts movement. One fault line — the North Anatolian fault (NAF) line, the meeting point of the Eurasian and Anatolian tectonic plates — is known to be “particularly devastating”. The NAF, one of the [best-understood fault systems in the world](#), stretches from the south of Istanbul to northeastern Turkey, and has caused catastrophic earthquakes in the past. In 1999 itself it caused two earthquakes — of 7.4 and 7.0 magnitude each — in Gölcük and Düzce provinces. Almost 18,000 people died and more than 45,000 were injured. In 2011 again, more than 500 people died when a 7.1 magnitude earthquake shook the eastern city of Van.

Then there is the East Anatolian fault line, the tectonic boundary between the Anatolian Plate and the northward-moving Arabian Plate. It runs 650 kilometers from eastern Turkey and into the Mediterranean. In addition to this, the Aegean Sea Plate, located in the [eastern Mediterranean Sea](#) under southern [Greece](#) and western Turkey, is also a source of seismic activity in the region.

According to one [estimate](#), almost 95% of the country's land mass is prone to earthquakes, while about a third of the country is at high risk, including the areas around the major cities of Istanbul and Izmir and the region of East Anatolia.

Between [2013 and 2022](#) there were 30,673 reported earthquakes across the world. Only two of them reached the same magnitude as of Monday's quake.

“It's a very large fault zone, but this is a larger earthquake than they've experienced any time in recent memory,” Karl Lang, an assistant professor at Georgia Tech University's School of Earth and Atmospheric Sciences, [told CNN](#), referring to Monday's earthquake.

Monday's tremors are believed to be the strongest since the December of 1939, when a magnitude-8.0 earthquake struck near the eastern city of Erzincan. The quake killed more than 20,000 people and damaged almost 1,16,720 buildings.

Between 1939 and 1999, Turkey has witnessed five major earthquakes. In August 1999, the Izmit Earthquake struck the Anatolian fault system, registering a magnitude of 7.4, and shook some of the most densely-populated urban areas for almost a minute. 17,000 people died, 1,20,000 houses crumbled down due to poor construction, and 2,50,000 were rendered

homeless. Three months later, a 7.2 earthquake again on the NAF lead to more than 845 deaths in the province of Duzce and surrounding areas.

Since 1900, more than 90,000 people have lost their lives in as many as 76 earthquakes. [About half of these](#) were lives lost to earthquakes in 1939 and 1999. Monetarily, Turkey has directly lost more than \$25 billion in the last century.

In 2021, in a “catastrophic projection”, an expert panel [warned](#) that 2,00,000 buildings in Istanbul stand at risk to medium- or high-level damage, jeopardizing the lives of three million residents in the city. An [investigation](#) into the 1999 earthquake that killed thousands found buildings did not meet design requirements and were not earthquake resistant, as is required by the regulations. They also used poor construction material and were shoddily constructed, experts noted. Multiple studies, including one [from 2020](#), have reiterated the caution, averring that multiple districts are vulnerable to earthquakes of more than 7.4 magnitudes. It’s not a question of “if” but “when”, experts opine.

The situation is direr in Syria, according to [reports](#), where quake-related destruction has taken hold of both government- and opposition-occupied regions – both facing debilitating winter storms that make it difficult for water, healthcare, food, and other humanitarian resources to reach these areas. The Syrian Civil Defence, which operates in the opposition-held portions, has declared a state of emergency, appealing to “the international community to support the rescue of civilians in Syria”.

COMMENTS

SHARE

[Turkey](#) / [Syria](#) / [earthquake](#) / [World](#)

BACK TO TOP

Comments have to be in English, and in full sentences. They cannot be abusive or personal. Please abide by our [community guidelines](#) for posting your comments.

We have migrated to a new commenting platform. If you are already a registered user of The Hindu and logged in, you may continue to engage with our articles. If you do not have an account please register and login to post comments. Users can access their older comments by logging into their accounts on Vuukle.

**END**

Downloaded from [crackIAS.com](#)

© **Zuccess App** by crackIAS.com