

Report on Moderate Earthquakes M 5.8 in Pakistan on September 11, 2024

An earthquake of magnitude M:5.8 occurred today, i.e. 11th September 2024 at 12:58:03 IST in Multan, Pakistan, with an epicentre at 31.25°N latitude and 70.52° E longitude and a focal depth of 33 km. The epicentre is approximately 100 km northwest of Multan (**Figure 1**).

Earthquakes occurring along the Main Central Thrust (MCT), a highly seismogenic zone, have historically included moderate to strong events, as shown in Figure 1. The MCT is a significant tectonic boundary where the Indian Plate is being thrust beneath the Eurasian Plate, leading to frequent seismic activity in the region. Historical data from the past decade show a consistent pattern of seismic events with magnitudes greater than 5.0 in this vicinity, highlighting the area's vulnerability to earthquakes. It has nothing to do with plate motion. There is no need for panic as the rupture occurred in Pakistan. Delhi felt shaking because of the connectivity MCT had to the Indian Northwest Himalayan region, which propagated through the amplification of alluvial sediments from the foothills of Gangetic alluvial and Yamuna sediments.

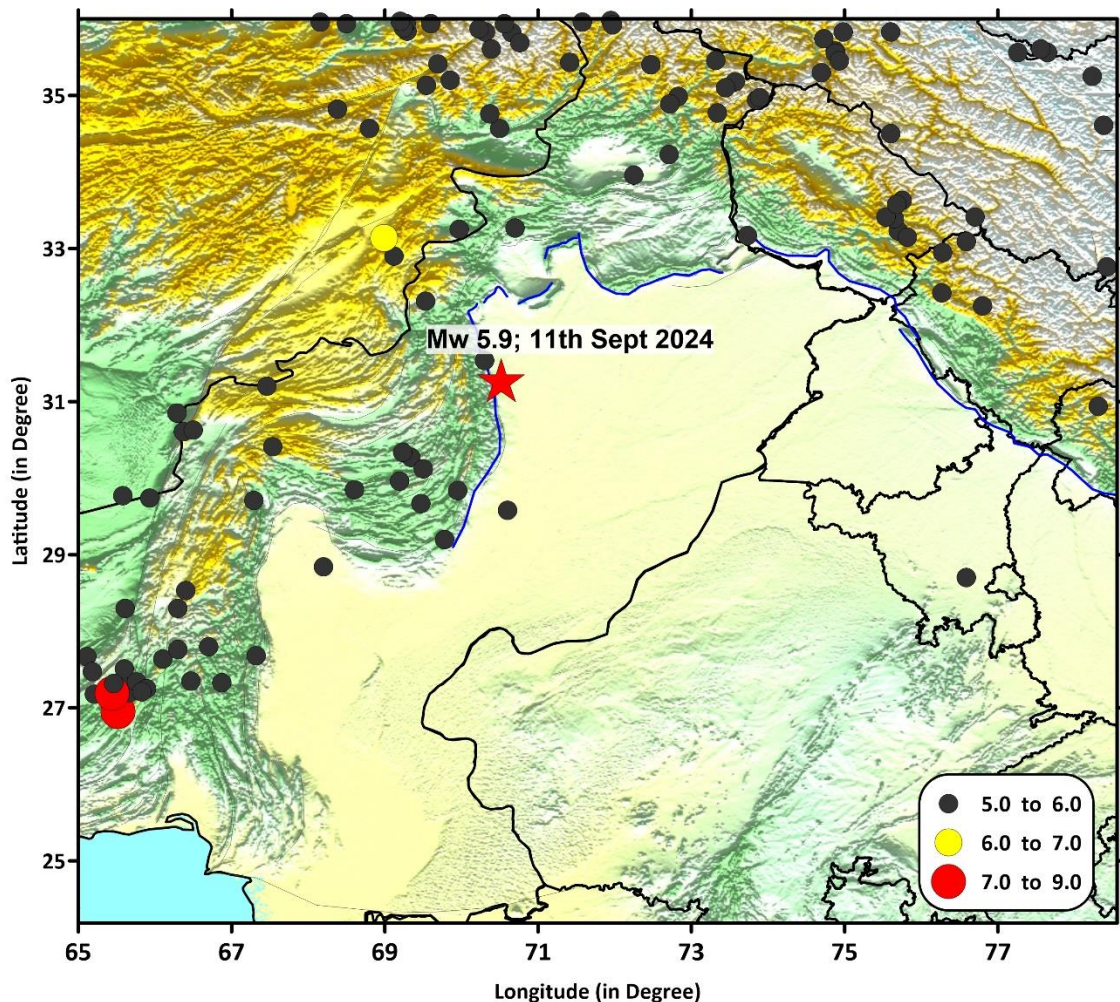


Figure 1: Map showing the location of the earthquake of M 5.8 (Red Star) on 11th September 2024 in Pakistan. The continuous thick black lines are the major fault system in the epicentral region. Circles are the last 10-year event that occurred in the surrounding region to today's events.

Preliminary analysis of the fault plane solutions, derived from waveform inversion, indicates that earthquakes were predominantly caused by thrust faulting. This suggests that the tectonic stress in the region is being released through compressional forces.

The maximum intensity of these earthquakes, as measured on the Modified Mercalli Intensity (MMI) scale, was recorded as VI near the epicentral region (**Figure 2**). This level of intensity typically results in strong shaking felt by all. The tremors were widely felt across New Delhi, Uttar Pradesh, Haryana, Punjab, and Rajasthan in India, as per the felt reports received through our website and mobile application. The reported intensities ranged from II to III on the MMI scale, indicating light to moderate shaking in the broader region (**Figure 3**).

The details of the maximum peak ground motion (PGA) recorded is tabulated below

Site	Maximum PGA	Distance from the epicentre (km)
Jammu	0.0004g	482
Bikaner	0.0004 g	492
Udhampur	0.0005 g	512

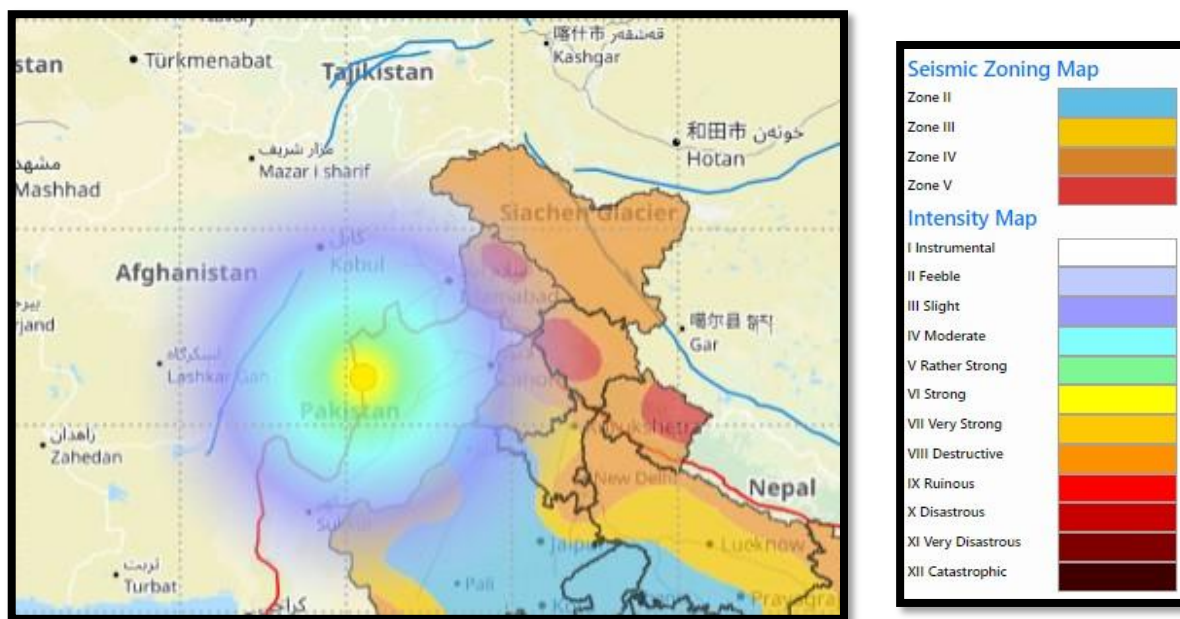


Figure 2: Expected Intensity map of earthquake of M 5.8 occurred on 11th September 2024 at Pakistan.



Figure 3: Felt responses (squares) of the 11th September 2024 earthquake of M 5.8 (circle) received through www.seismo.gov.in and BhooKamp mobile app.