

14 July 2025

Context: A recent earthquake measuring 4.4 on the Richter scale, with its epicenter located in Jhajjar (Haryana), has once again raised alarms regarding the significant seismic vulnerability of the Delhi-NCR region.



About Vulnerability of Delhi-NCR to Earthquakes:

What is Delhi's seismic risk?

- Delhi is situated in Seismic Zone IV, which the Bureau of Indian Standards (BIS) categorizes as a zone with a high risk of damage. The area is susceptible to moderate to strong earthquakes, occasionally reaching magnitudes of 5 to 6, with the potential for events exceeding 7 in magnitude.

How vulnerable is Delhi-NCR?

- The dense population, lack of regulation in construction, and aging infrastructure render Delhi particularly vulnerable to damage caused by earthquakes. The National Center for Seismology (NCS) has pointed out the frequent tremors resulting from shallow-focus earthquakes due to the presence of nearby active faults.

14 July 2025

Reasons Behind Earthquake Vulnerability:

- **Proximity to Himalayan Frontal Thrust:** Delhi's location near the tectonically active Himalayan region, where the Indian and Eurasian plates converge, creates significant deep-seated stress.
- **Active Fault Lines Across NCR:** Prominent fault systems such as the Delhi-Haridwar Ridge, Delhi-Moradabad Fault, Sohna Fault, and Mahendragarh-Dehradun Fault contribute to the increased seismic risk.
- **Subsurface Weak Zones:** Seismic research has identified lineaments, including the Yamuna and Ganga River faults, which suggest deep crustal weaknesses.
- **Historical Seismicity Pattern:** Since 1720, Delhi has recorded at least five earthquakes with magnitudes ranging from 5.5 to 6.7, indicating a pattern of recurring seismic activity.
- **Rapid Urbanisation Without Seismic Code Compliance:** The unplanned urban growth and the absence of enforcement of IS-1893 seismic design codes heighten the structural vulnerability of the region.