



India's Earthquake Preparedness

For Prelims: Turkey Syria Earthquake, Richter Scale, Himalayan Plate, Tectonic Plates.

For Mains: Causes of Earthquake, Earthquakes In/Around India, Steps for Earthquake Preparedness in India.

Why in News?

A severe [earthquake](#) followed by an almost **equal magnitude aftershock hit southeastern Turkey and Syria** on February 6, 2023, causing widespread destruction and loss of life.

- The [Turkey-Syria earthquake](#) should motivate a review of **India's earthquake preparedness, as poor enforcement of zoning and construction rules** is prevalent in the country.

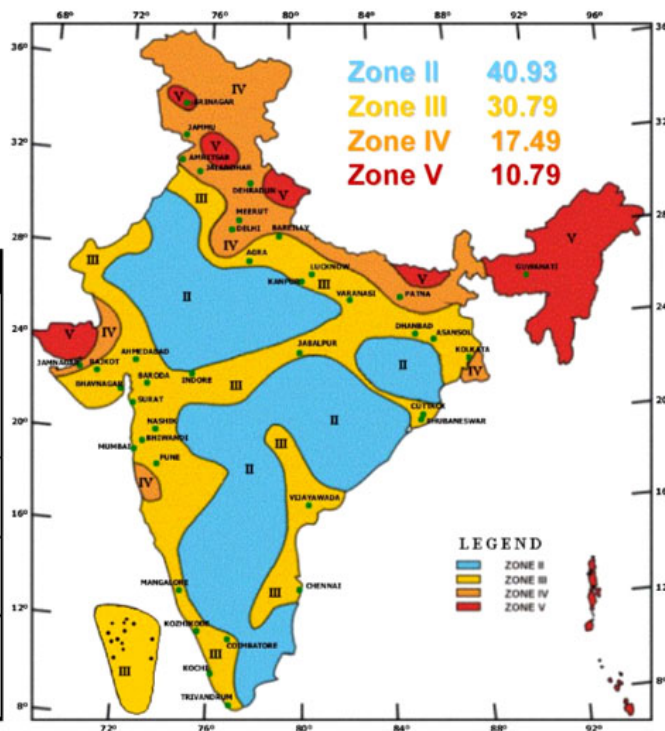
What Makes India Susceptible to Earthquakes?

- **About:**
 - India's terrain is **prone to great earthquakes**, particularly in the [Himalayan plate boundary](#), which has the potential for large quakes (**magnitude 7 and above**).
 - In India, earthquakes are primarily caused by the collision of the **Indian Plate with the Eurasian Plate**.
 - This collision has resulted in the formation of the **Himalayas**, as well as frequent earthquakes in the region.
- **Seismic Zones:**

Seismic Zone Map of India: -2002

About 59 percent of the land area of India is liable to seismic hazard damage

Zone	Intensity
Zone V	Very High Risk Zone Area liable to shaking Intensity IX (and above)
Zone IV	High Risk Zone Intensity VIII
Zone III	Moderate Risk Zone Intensity VII
Zone II	Low Risk Zone VI (and lower)



Seismic zonation and intensity map of India

▪ Susceptibility of Major Earthquakes:

- Scientists are aware of identifiable **seismic gaps** along the Himalayan axis where the historical **release of geological tension** doesn't fully account for the strain that has built up.
 - For instance, the **Central Himalaya has been historically deficient in earthquakes compared to other areas**. So, it's **one region that can reasonably be expected to generate a large earthquake** in the future.

Note: Seismic Gap is the part of an active fault that has experienced little or no seismic activity for a long period, indicating the buildup of stresses that are useful in predicting earthquakes.

▪ Earthquakes In/Around India:

- India has experienced several significant earthquakes over the years, here are some examples:

Number	Place	# of Deaths	Date, Time, and Year	Magnitude	Epicenter
1	Indian Ocean	> 283,106	08:50, December 26th, 2004	9.1–9.3	West coast of Sumatra, Indonesia
2	Kashmir	130,000	08:50:38, October 8th, 2005	7.6	Muzaffarabad, Pakistan-administered Kashmir
3	Bihar and Nepal	> 30,000	14:13, January 15th, 1934	8.7	South of Mount Everest
4	Gujarat	20,000	08:50, January 26th, 2001	7.7	Kutch, Gujarat
5	Kangra	> 20,000	06:10, April 4th, 1905	7.8	Himalayas
6	Latur	> 9,748	22:25, September	6.4	Killari, Latur

- **Nepal Earthquake 2015:** On April 25, 2015, a **magnitude 7.8 earthquake** struck Nepal. The earthquake also had a significant impact in northern India.
- **Imphal Earthquake 2016:** On January 4, 2016, a **magnitude 6.7 earthquake** struck the **northeastern Indian state of Manipur**, causing widespread damage.
- **Uttarakhand Earthquake 2017:** On February 6, 2017, a **magnitude 6.7 earthquake** struck the northern Indian state of Uttarakhand.

What Steps can be Taken for Earthquake Preparedness in India?

- **Building Codes and Standards:** India has established **building codes and standards for earthquake-resistant construction**.
 - It is important to **strictly enforce these codes and standards to ensure that new buildings are built to withstand earthquakes**. This will also require regular inspections and enforcement of existing building codes.
- **Retrofitting and Reinforcement:** Older buildings may not meet current earthquake-resistant standards, and many of them **can be retrofitted or reinforced to improve their [seismic performance](#)**.
- **Emergency Response Planning:** Planning for emergency response is critical for minimising the impact of earthquakes. This includes **developing evacuation plans, establishing emergency shelters**, and training personnel on how to respond to earthquakes.
- **Research and Monitoring:** Investing in research and monitoring can help improve **our understanding of earthquakes and their causes**, and can also help to develop better methods for predicting and mitigating their impact.
- **Land-Use Planning:** It is important to consider the potential impacts of earthquakes when planning and developing land-use policies. This includes **limiting development in areas that are prone to earthquakes** and ensuring that new development is designed and constructed in a way that minimises the risk of damage.

UPSC Civil Services Examination Previous Year Question (PYQ)

Q. The frequency of earthquakes appears to have increased in the Indian subcontinent. However, India's preparedness for mitigating their impact has significant gaps. Discuss various aspects. **(2015)**

Q. Discuss about the vulnerability of India to earthquake related hazards. Give examples including the salient features of major disasters caused by earthquakes in different parts of India during the last three decades. **(2021)**

[Source: TH](#)

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