EARTHQUAKE: GEOGRAPHY

NEWS: Making India More Disaster-Resilient

WHAT'S IN THE NEWS?

India is highly vulnerable to earthquakes, with 59% of the country at risk, especially in seismic zones like the Himalayan region. The government is enhancing earthquake preparedness through policies, safety guidelines, and early warning systems, while strengthening infrastructure and public awareness to minimize damage.

Introduction to Earthquake Vulnerability in India

- **Cause of Earthquakes**:
    - Earthquakes occur due to stress in the Earth's crust caused by the shifting of tectonic plates. This stress results in the release of energy, which causes ground shaking and other seismic activities.
- **Seismic Zones of India**:
    - Approximately **59% of India** is vulnerable to earthquakes, with regions classified into **four seismic zones** by the **Bureau of Indian Standards (BIS)**.
    - **Zone V**: The **most active seismic zone**, covering the **Himalayan region** and parts of **Northeast India**, which are prone to significant seismic activity.
    - **Zone II**: The **least earthquake-prone zone**, found in some parts of the country where earthquake activity is minimal.

Major Earthquakes in India's History

- **1905 Kangra Earthquake**:
    - Occurred in **Himachal Pradesh** with a magnitude of **8.0**, resulting in **19,800 deaths**. This was one of the deadliest earthquakes in Indian history.
- **2001 Bhuj Earthquake**:
    - **Magnitude 7.9** earthquake that struck **Gujarat** in **2001**. It caused **12,932 deaths** and significant damage, affecting **890 villages** and leaving a lasting impact on the region.
- **Recent Earthquakes (Nov 2024-Feb 2025)**:
    - India experienced **159 earthquakes**, including a **4.0 magnitude earthquake in Delhi** on **February 17, 2025**. These tremors highlight the persistent threat of seismic activity in the country.

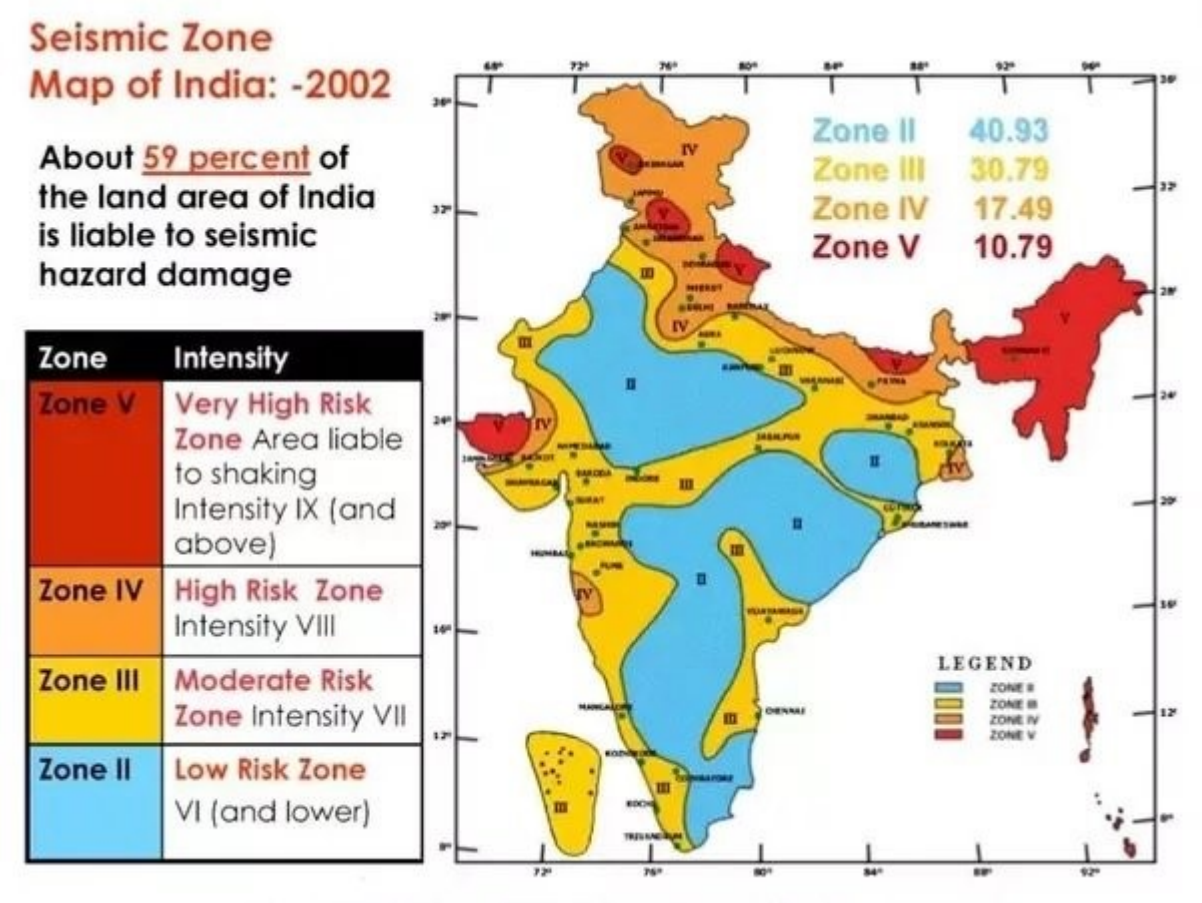
Government Initiatives for Earthquake Safety

- **Humanitarian Assistance and Disaster Relief (HADR)**:
    - The government provides humanitarian aid to other countries affected by disasters. For instance, India sent relief to **Türkiye** and **Syria** after the **2023 earthquake**.
- **Disaster Management Framework**:
    - **National Disaster Response Force (NDRF)**: Established in **2006**, with **16 battalions**, each consisting of **1,149 personnel**. NDRF specializes in **disaster response** and helps in the recovery process after significant events.
    - **National Centre for Seismology (NCS)**: Founded in **1898**, NCS is responsible for monitoring **earthquake activity** across India and developing **early warning systems** to predict seismic events.
    - **National Disaster Management Authority (NDMA)**: Formed under the **2005 Disaster Management Act**, NDMA creates **disaster management policies** and guides local governments. Each state also has its own **State Disaster Management Authority (SDMA)** for regional response coordination.
    - **National Institute of Disaster Management (NIDM)**: Established in **1995**, NIDM focuses on **training, research**, and **capacity building** for disaster management, ensuring that personnel are prepared to handle emergencies effectively.

Key Earthquake Safety Measures and Research Initiatives

- **Guidelines for Earthquake Safety**:
    - **Home Owner's Guide (2019)**: This guide assists homeowners in building **earthquake-resistant homes**, providing useful tips and strategies for making residential buildings safer.
    - **Simplified Guidelines (2021)**: These guidelines help **homebuyers** and **builders** understand the necessary safety measures to incorporate into building plans to withstand earthquakes.
- **Earthquake Early Warning (EEW)**:
    - **Research** is ongoing in the **Himalayan region** to develop **Earthquake Early Warning (EEW)** systems that would provide **advance alerts** for impending seismic events, reducing potential damage.
    - **National Centre for Seismology (NCS)** records and shares earthquake data in real-time to improve public awareness and preparedness.
- **Earthquake Risk Indexing (EDRI)**:
    - Conducted by the **NDMA**, this initiative aims to assess earthquake risks in Indian cities. **Phase I** covered **50 cities**, while **Phase II** is set to cover an

additional **16 cities**. This indexing helps identify high-risk areas and prioritizes them for better preparedness.



Conclusion: Improving Earthquake Preparedness in India

- **Policy and Safety Measures**:
    - India is actively working to improve its earthquake preparedness by implementing **policies**, **safety guidelines**, and **early warning systems**. The government has been strengthening infrastructure and ensuring that the country is better equipped to handle seismic events.
- **Strengthening Infrastructure and Public Awareness**:
    - **Building resilient infrastructure** and increasing **public awareness** are crucial in reducing the damage caused by earthquakes. Educating citizens about **earthquake preparedness** and making structures **earthquake-resistant** will help save lives and minimize the impact of future earthquakes.
- **Sustainable Development**:

- As India continues to develop rapidly, integrating **earthquake safety measures** into **urban planning** and **construction practices** is critical. Urban areas with high population density and infrastructure must adopt **seismic design standards** to withstand possible seismic events.

Key Takeaways:

- Earthquakes remain a significant threat in India, with around **59% of the country** being vulnerable.
- The government has developed several **disaster management initiatives** and safety measures to mitigate the impact of earthquakes.
- Effective **early warning systems**, **research** on **earthquake-resistant infrastructure**, and **public education** will be crucial in minimizing future risks associated with seismic activity.

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