1. India Earthquake Zone Mapping Revision- Geography

The recent decision by the Union Government to roll back the proposed revision of India's earthquake zoning map marks a significant moment in the intersection of public safety, engineering standards, and economic policy. The Bureau of Indian Standards (BIS) had aimed to modernize India's seismic risk assessment by moving toward a probabilistic model, a move that met with significant institutional resistance.

1. Background and Definitions

To understand the conflict, it is essential to define the core concepts governing how India prepares for seismic events.

Seismic Zonation Map- A scientific tool that divides a geographic region into zones based on the historical frequency and intensity of earthquakes. It serves as the primary guideline for engineers and urban planners to determine how strong a building needs to be.

The Bureau of Indian Standards (BIS)- The national body responsible for formulating these seismic codes (specifically IS 1893), ensuring that infrastructure can withstand ground shaking.

Deterministic vs. Probabilistic Assessment-

Deterministic (Current)- Focuses on a "worst-case scenario" based on known historical events.

Probabilistic Seismic Hazard Assessment (PSHA)- A sophisticated method that calculates the likelihood of various levels of ground shaking over a specific timeframe, accounting for uncertainties in earthquake magnitude, location, and frequency.

2. The Proposed Shift- PSHA and Zone VI

The BIS proposed a transition from fixed, simpler zoning to the global standard of PSHA. This transition included a controversial structural change to the map itself.

Introduction of Zone VI

The revision attempted to introduce a new "High-Risk" Category—Zone VI. This would have reclassified several areas currently in Zone V (the highest risk) into an even more stringent bracket.

Proposed Regions for Zone VI-

Most of the Kashmir Valley.
Critical sections of the Himalayan belt.
The Kutch region in Gujarat.
Specific high-vulnerability parts of North-East India.

Comparison- Current vs. Proposed Framework

Feature	Current Model (Fixed/Deterministic)	Proposed Model (PSHA)
Risk Basis	Historical "maximum" earthquake events.	Statistical likelihood and frequency of shaking.
Zoning Scale	Four Zones (II, III, IV, and V).	Five Zones (Addition of Zone VI).
Flexibility	Static; does not easily account for new data.	Dynamic; incorporates multiple potential scenarios.
Infrastructure Goal	Minimum safety against known history.	Realistic design based on mathematical probability.

3. The Significance of PSHA

Adopting PSHA is not merely a technical change; it represents a move toward advanced disaster resilience used by major global economies.

Scientific Accuracy- It provides a more nuanced view of seismic hazards by analysing multiple potential events rather than just one.

Infrastructure Design- Helps in the precise calibration of design standards for high-stakes projects like nuclear plants, mega-dams, and metro systems.
Urban Planning- Allows for more granular risk mapping, helping cities prepare for specific intensities of ground shaking.

4. Institutional Pushback

The rollback was triggered by concerns from key government bodies regarding the practical and economic feasibility of the new map.
Opposing Entities-
Ministry of Housing and Urban Affairs
Ministry of Home Affairs
Central Water Commission
National Dam Safety Authority

5. Primary Concerns and Impact

The government's hesitation stems from three main pillars- economic cost, urban development, and environmental impact.

A. Higher Construction Costs

Moving a region up by even one zone has massive financial implications.
Residential Impact- Estimates suggest a one-zone increase raises costs by 20%, while a two-zone increase could hike costs by nearly 33%.
Infrastructure Impact- For massive projects like dams, power stations, and metro rails, the cost increase is significantly higher due to the specialized materials and engineering required.

B. Impact on Urban Development

Stalling Growth- Stricter zoning could freeze development in economically fragile or strategically important regions like the North-East or the Himalayas.
Informal Housing Risk- If formal construction becomes too expensive, more citizens may turn to the informal sector (which already accounts for 80% of Indian homes). Informal buildings rarely follow *any* seismic codes, paradoxically increasing the risk of mass casualties during an earthquake.

C. Climate and Environmental Implications

Carbon Footprint- Stronger buildings require significantly more cement and steel.
Emissions- The construction sector is a primary source of India's carbon emissions; mandated increases in material usage would conflict with India's climate goals.

6. Why Revision is Still Necessary

Despite the rollback, the underlying need for a revised map remains urgent due to India's current growth trajectory.
Rapid Urbanization- India is expanding its urban footprint faster than almost any other nation.
Strategic Infrastructure- Metros, highways, and dams are being built in seismically active zones (like the Himalayas) to bolster connectivity.
Compounding Risks- The combination of climate-induced disasters (like landslides) and urbanization makes traditional seismic zoning insufficient for modern safety needs.
Source- https-//www.thehindu.com/opinion/editorial/a-seismic-decision-on-revision-to-indias-earthquake-zoning-rollback/article70731340.ece