

GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
RAJYA SABHA  
UNSTARRED QUESTION No. - 28  
ANSWERED ON 02/02/2023

PREDICTION ACCURACY OF EARTHQUAKE EARLY WARNING SYSTEM

28. SHRI ANIL DESAI:

Will the Minister of Earth Sciences be pleased to state:

- (a) whether 54 percent geographical area of India is highly vulnerable to earthquakes and if so, the details thereof;
- (b) whether Government has maintained any data of Indian cities which are in the highly vulnerable zone and if so, the details thereof, State/UT-wise;
- (c) the measures being taken by Government to create awareness about earthquake-resistant buildings in such cities;
- (d) whether the country's earthquake early warning system is able to predict earthquakes of any intensity;
- (e) if so, the extent to which an earthquake can be accurately predicted; and
- (f) if not the reasons therefor?

**ANSWER**

THE MINISTER FOR STATE (INDEPENDENT CHARGE) FOR  
MINISTRY OF SCIENCE AND TECHNOLOGY  
AND EARTH SCIENCES  
(DR. JITENDRA SINGH)

- (a) Considering the recorded history of earthquakes in the country, a total of ~59% of the land mass of India is prone to earthquakes of different intensities. As per the seismic zoning map of the country given by Bureau of Indian Standards, the total area is classified into four seismic zones. Zone V is seismically the most active region, while zone II is the least. Approximately, ~11% area falls in zone V, ~18% in zone IV, ~30% in zone III and remaining in zone II.
- (b) The major cities in the country falling under zone V and zone IV, state/UT wise, are given below:

City/Town	State/UT	Zone	City/Town	State/UT	Zone
Almora	Uttarakhand	IV	Jorhat	Assam	V

Ambala	Haryana	IV	Jalpaiguri	West Bengal	IV
Amritsar	Punjab	IV	Kooch Bihar	West Bengal	IV
Baharich	Utter Pradesh	IV	Kohima	Nagaland	V
Barauni	Bihar	IV	Kolkata	West Bengal	IV
Bhuj	Gujarat	V	Ludhiana	Punjab	IV
Bulandshahr	Uttar Pradesh	IV	Mandi	Himanchal Pradesh	V
Chandigarh	Chandigarh	IV	Monghyr	Bihar	IV
Darbhanga	Bihar	V	Moradabad	Uttar Pradesh	IV
Darjeeling	West Bengal	IV	Nainital	Uttrakhand	IV
Dehradun	Uttarakhand	IV	Patna	Bihar	IV
Deoria	Uttar Pradesh	IV	Parganas	West Bengal	IV
Delhi	Delhi	IV	Pilibhit	Uttar Pradesh	IV
Dinajpur	West Bengal	IV	PortBlair	Andaman & Nicobar	V
Ghaziabad	Uttar Pradesh	IV	Roorkee	Uttrakhand	IV
Gangtok	Sikkim	IV	Sadiya	Assam	V
Guwahati	Assam	V	Shimla	Himanchal Pradesh	IV
Gorakhpur	Uttar Pradesh	IV	Srinagar	Jammu & Kashmir	V
Imphal	Manipur	V	Tezpur	Assam	V

- (c) NDMA has been conducting regular awareness campaigns every year through print, electronic as well as social media from time to time, on earthquakes that include precautions for building safety from earthquakes. Also, Guidelines have been published by the Bureau of Indian Standards (BIS), Building Materials & Technology Promotion Council (BMTPC) and Housing and Urban Development Corporation (HUDCO) etc. for design and construction of earthquake resistant structures to minimize the loss of life and damage to property caused by earthquakes. These guidelines are in wide circulation amongst the public and the administrative authorities responsible for the design and construction of earthquake resistant structures in earthquake prone areas.
- (d), (e) and (f) Presently, no proven system exists in the country to provide the early warning of earthquakes. Since there is no scientific technique available anywhere in the world to predict an earthquake precisely in terms of time, location and its magnitude. However, National Center for Seismology, Ministry of Earth Sciences in collaboration with other National/International laboratory/Universities is doing various research on Earthquake for Early Warning systems.

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