GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOKSABHA
UNSTARRED QUESTION NO. 2494
TO BE ANSWERED ON WEDNESDAY, 21st DECEMBER, 2022

EARTHQUAKE PRONE ZONES

†2494. SHRI GHANSHYAM SINGH LODHI:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) the details of the earthquake prone zones/sections in the country;
(b) whether any study of earthquakes has been conducted by the Government in the said zones/sections during the last five years, if so, the details thereof;
(c) whether the earth's temperature has been rising continuously;
(d) if so, whether any assessment of the potential effects of temperature rise on human beings has been carried out by the Government;
(e) if so, the details thereof;
(f) whether it is forecasted that a massive destructive earthquake is likely to hit the Himalayan region; and
(g) if so, the extensive preparations of the Government in this regard?

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

(a) The whole country has been divided into four zones viz. zone V, IV, III and II according to the seismic zoning map of India prepared by Bureau of Indian Standards (BIS). A total of ~59% of the land mass of India (covering all states of India) is prone to earthquakes of different shaking intensities. As per the seismic zoning map of the country, 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 of the country falls in zone V, ~18% in zone IV, ~ 30% in zone III and remaining in zone II.

Details of states and areas in the country falling in different seismic zones (based on seismic zoning map of India) are given below:

Zone V Parts of Jammu and Kashmir (Kashmir valley), western part of Himachal Pradesh, Eastern part of Uttarakhand, Rann of Kutch in Gujarat, part of Northern Bihar, all northeastern states of India and Andaman & Nicobar Islands

Zone IV remaining parts of Jammu & Kashmir, Ladakh, remaining part of Himachal Pradesh and Uttarakhand, Some parts of Haryana, Parts of Punjab, Delhi, Sikkim, northern part of Uttar Pradesh, small portions of Bihar and West Bengal, parts of Gujarat and small portions of Maharashtra near the west coast and small part of western Rajasthan

Zone III Kerala, Goa, Lakshadweep islands, some parts of Uttar Pradesh and Haryana, remaining parts of Gujarat and Punjab, some part of West Bengal, part of western Rajasthan, part of Madhya Pradesh, remaining part of Bihar, northern parts of Jharkhand and Chhattisgarh, parts of Maharashtra, parts of Odisha, parts of Andhra Pradesh and Telangana, Parts of Tamilnadu and Karnataka.

Zone II remaining Parts of Rajasthan and Haryana, remaining parts of Madhya Pradesh and Maharashtra, remaining parts of Odisha and Andhra Pradesh, remaining parts of Telangana and Karnataka, remaining parts of Tamilnadu.

(b) Yes, Sir. National Centre for Seismology (NCS) under Ministry of Earth Sciences is the nodal agency of Government of India (GoI), for monitoring earthquakes in and around the country. For this purpose, NCS maintains a National Seismological Network consisting of 152 observatories spread across the country. The information of earthquakes reported by NCS is disseminated to the concerned central and state disaster authorities in least possible time to initiate the adequate mitigation measures through its website and other social media platforms. The detailed information of the earthquakes is also available on the website of NCS (seismo.gov.in). Apart from extensive research by NCS, earthquake data acquired by the centre are also available for conducting seismological research for addressing various issues of earthquake generating processes by different research and academic organisations of the country. The major outcome of these studies provides a deep insight into the earthquake processes and related parameters to assess the seismic hazards of the country.

Secondly, Seismic Microzonation of important cities in India having population of 5 Lakh and above is also considered. The purpose is to generate inputs for constructing earthquake risk resilient buildings/structures to reduce and mitigate the impacts of earthquake shaking and for minimising the damages to structures and loss of lives for safer urban planning. Seismic Microzonation work started with Microzonation of Jabalpur and subsequently it has been completed for a few more areas like Guwahati, Bangalore, Sikkim, Ahmedabad, Gandhidham- Kandla. Seismic Microzonation of Delhi and Kolkata has comprehensive data sets.

Seismic Microzonation of 12 cities (Coimbatore, Chennai, Bhubaneswar, Mangalore, Agra, Amritsar, Lucknow, Kanpur, Varanasi, Patna, Dhanbad and Meerut), is carried out in phased manner by NCS and reports for these cities are to be released on completion of the compilation of entire dataset and interpretation of the processed data for each city.

(c)-(e) Yes Sir, The Earth's temperature has increased in the range of ~0.9 to ~1.1 degrees Celsius over the past ~150 years on average, concomitant with increase in surface air temperatures as a result of climatic warming. This information, obtained from temperature measurements in boreholes distributed in different climatic provinces in the country, is complementary to the primary information obtained from meteorological stations operated by the India Meteorological Department.However, Ministry of Earth Sciences has not carried out any assessment of the effects oftemperature-rise on human beings.

(f) The Himalayan belt is considered as one of the most seismically active intra-continental regions of the world. This region has witnessed several moderate to great magnitude earthquakes and a few very great (M>8.0) earthquakes along its about 2400 km long belt. The seismicity in this region is mainly attributed to the Main Himalayan Thrust along which Indian plate under thrusts beneath the Himalayan wedge. The prominent earthquakes in this region are 1897Shillong Plateau (M:8.1), 1905Kangra (M:7.8), 1934Bihar-Nepal Border (M:8.3), Arunanchal-China border 1950(M:8.5), 2015 Nepal Earthquake (M:7.9). Scientists have indicated that strain accumulation for the earthquake occurrence is currently going on along the Main Himalayan Thrust, where great earthquakes are expected to occur.

(g) National Disaster Management Authority (NDMA) of India is engaged with conducting regular awareness campaigns every year through print, electronic as well as social media from time to time to sensitize programs on prevention and preparedness for building safety from earthquakes.

Besides that, Government of India is poised to follow guidelines 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 risk 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.

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