

**GOVERNMENT OF INDIA
EARTH SCIENCES
LOK SABHA**

UNSTARRED QUESTION NO:2667

ANSWERED ON:29.03.2012

EARTHQUAKE IN DELHI

Gavit Shri Manikrao Hodlya

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the intensity of the earthquake which hit Delhi on 5 March, 2012 at 01.11 p.m. was 4.9 on the Richter Scale while America has measured it as 5.2;
- (b) if so, the details thereof;
- (c) the cities which were affected by this earthquake and the impact thereon with the details of damage to property and lives therein; and
- (d) the maximum intensity of earthquake that the buildings in the National Capital Region can tolerate so that damage to property and life is negligible?

Answer

MINISTER OF STATE IN THE MINISTRY OF PLANNING, MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE IN THE MINISTRY OF EARTH SCIENCES (DR. ASHWANI KUMAR)

(a) Yes Madam.

(b) The magnitude of an earthquake is estimated on various magnitude scales, depending upon the size, the focal depth and distance of the epicenter from the recording station within the seismicity monitoring network. The magnitude reported by the India Meteorological Department (IMD) as 4.9 (with its epicenter at Latitude 28.7o N & Longitude 76.7o E at a distance of about 28km from Bahadurgarh, Haryana state) is based on the recordings of nearby seismic stations in India and is on Richter (Local) magnitude scale, where as the magnitude reported by United States Geological Survey (USGS) is based on recordings of far off stations commissioned by other country agencies and is on a different scale, called 'Body wave magnitude scale'. Considering the above, variation in the magnitude estimates made by various national and international agencies of the order of + 0.2 to 0.3 units, as happened in this particular case, is not unusual.

(c) The effect of the earthquake was widely felt in the National Capital Region (NCR) of Delhi and parts of adjoining states. However, no significant damage to property or loss of life has been reported due to this earthquake.

(d) As per the seismic zoning map of India, prepared under the auspices of Bureau of Indian Standards [IS-1893 (Part-1): 2002], the country is grouped into four seismic zones viz. Zone-II, -III, -IV and -V. Of these, Zone-V is the most seismically prone area, while zone-II is the least. As per this classification, the NCR falls in seismic Zone-IV of the seismic zoning map of India having fairly high seismicity with the general possibility of earthquakes occurrence is of 5-6 magnitude, a few of magnitude 6-7 and occasionally of 7-8 magnitude exists. The NCRs settlement pattern has never been viewed in relation to location and geological characteristics. So far as housing is concerned, vulnerability analysis has not been carried out and preliminary estimate of damages is not available for strengthening of structures under normal improvement development schemes. Recently, Reserve Bank of India has circulated National Disaster Management Authority (NDMA) guidelines for ensuring disaster resilient construction of buildings and infrastructure for adoption by all scheduled commercial banks and other lending institutions so as to incorporate relevant provisions as part of their loan policies, procedures and documentation.

Despite the above, detailed macro-level microzonation studies for NCR Delhi, involving preparation of geological, geomorphological and land use maps followed by drilling, geological logging, standard penetration test and geophysical studies, to demarcate the zones of least to most damage prone areas within the urban areas helps the respective town and country planning agencies to formulate perspective planning within the overall earthquake impact minimization efforts. Guidelines have also been published by the Bureau of Indian Standards (BIS), Building Materials & Technology Promotion Council (BMTPC), Housing and Urban Development Corporation (HUDCO) and NDMA for the design and construction of earthquake resistant structures to minimize the loss of life and damage to property caused by earthquakes. Loss of life and damage to property due to earthquakes could be considerably reduced through proper planning and implementation of pre- and post-disaster preparedness and management strategies by respective State and Central Government agencies in a coordinated manner following the above mentioned guidelines.