

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 1780
TO BE ANSWERED ON WEDNESDAY, JULY 26, 2017**

EARTHQUAKE PRONE STATES

1780. SHRI RAYAPATI SAMBASIVA RAO:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether there is a policy for tackling earthquakes in the country;**
- (b) if so, the details thereof and if not, the reasons therefor;**
- (c) the details of earthquake-prone State/areas in the country, location-wise;**
- (d) the measures put in place during the last three years in these States; and**
- (e) the action plan to ensure that damage to earthquake areas are minimized and rescue operations are carried out on war footing?**

ANSWER

**MINISTER OF STATE FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES
(SHRI Y. S. CHOWDARY)**

- (a-b) National Centre for Seismology (NCS), monitor earthquake activity in real time basis (24x7). It maintains a country wide seismological network, to detect and locate earthquakes occurring in and around the country. The network consists of state-of-art digital broadband seismographs, VSAT based communication systems and latest tools for dissemination of earthquake information to the concern disaster management authorities and other user agencies in least possible time. The network also includes a 17-station real time seismic monitoring system to monitor and report large magnitude earthquakes capable of generating tsunamis on the Indian coastal regions. An tsunami early warning system is also in place at Indian National Centre for Ocean Information Services (INCOIS), Hyderabad to provide early warning on tsunamis likely to be generated on the Indian Coastal areas by large magnitude under sea earthquakes.**
- (c) Bureau of Indian Standards [IS-1893 (Part- 1): 2002], based on the past seismic history, grouped the country into four seismic zones, viz. Zone-II, -III, -IV and -V. Of these, Zone V is the most seismically active region, while zone II is the least. The Modified Mercalli (MM) intensity, which measures the impact of the earthquakes on the surface of the earth, broadly associated with various zones, is as follows:**

Seismic Zone	Intensity on MM scale
II (Low intensity zone)	VI (or less)
III (Moderate intensity zone)	VII
IV (Severe intensity zone)	VIII
V (Very severe intensity zone)	IX (and above)

Broadly, Zone-V comprises of entire northeastern India, parts of Jammu and Kashmir, Himachal Pradesh, Uttaranchal, Rann of Kutch in Gujarat, parts of North Bihar and Andaman & Nicobar Islands. Zone-IV covers remaining parts of Jammu & Kashmir and Himachal Pradesh, Union Territory of Delhi, Sikkim, northern parts of Uttar Pradesh, Bihar and West Bengal, parts of Gujarat and small portions of Maharashtra near the west coast and Rajasthan. Zone-III comprises of Kerala, Goa, Lakshadweep islands, remaining parts of Uttar Pradesh, Gujarat and West Bengal, parts of Punjab, Rajasthan, Madhya Pradesh, Bihar, Jharkhand, Chhattisgarh, Maharashtra, Orissa, Andhra Pradesh, Tamilnadu and Karnataka. Zone-II covers remaining parts of the country.

Bureau of Indian Standard (BIS) has also identified important towns/urban areas in India, falling in seismic zones II, III, IV and V (Annexure-A).

- (d) During last three years seismic microzonation of NCT Delhi and Kolkatta has been completed.**

At Present ,NCS maintains a National Seismological Network (NSN) for real time monitoring of earthquake activities in and around the country. The NSN now consists of 84 state-of-art digital broadband seismograph stations with VSAT commutations facilities for real time monitoring and auto location of earthquakes in and around the country. This system has latest tools for dissemination of earthquake information to the concerned disaster management authorities and other user agencies in least possible time (8- 10minutes) for relief and rescue operations in hour of need.

Under the Koyna Deep Borehole programme, studies have been initiated to carry out scientific investigations for deep borehole drilling in the KoynaWarna region. The investigations include, Seismological, Geophysical (seismic, gravity, magnetic), LIDAR, geomorphology and structural geological studies, apart from a few exploratory boreholes.

- (e) The National Disaster Management Authority (NDMA) has also issued National Disaster Management Guidelines on Management of Earthquakes which contains roles and responsibilities of all stakeholders for effective management of earthquake disaster risk. NDMA runs awareness campaigns on Earthquake through electronic media Doordarshan, All India Radio, Private TV channels, FM Channels, digital cinemas, 139 - Railway Enquiry and print media. Multi State Mega Mock exercises are conducted at regular intervals for creating awareness. Every year during IITF in Delhi, awareness is disseminated among general public by displaying panels on Do's and Don'ts on Earthquakes and by holding live demonstrations on earthquake by National Disaster**

Response Force (NDRF). Guidelines have 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 of 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. These studies 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 so as to help the respective town and country planning agencies to formulate perspective planning within the overall earthquake impact minimization efforts. Based on the above steps it is mandatory for all infrastructure/building/ development agencies (Public and Private) to design appropriate earthquake resistant building plans based on the relevant BIS Codes and other guidelines of BMTPC, HUDCO and NDMA for across the country.

The Government has also implemented various programmes to educate and raise awareness amongst school children and general public on various aspects of earthquakes, their impacts and measures to mitigate losses. Following awareness programmes are organized by the Government in preparing communities to respond to the earthquake:

- **Earthquake information located by NCS is put on its website for public in general.**
- **School children from different schools of NCR region visit the facilities at NCS and get first hand information on earthquake monitoring in the country. School children also visit to the seismological observatories located in different parts of the country.**
- **NCS is regularly participating in MoES exhibition stall at India International Trade Fair (IITF), New Delhi and in Indian National Science Congress yearly event by putting an exhibition stall in seismology under MoES banner for visitors.**

Annexure-A

List of important towns falling in seismic zone II, III, IV and V

Town	State/UT	Zone	Town	State/UT	Zone
Agra	Utter Pradesh	III	Chitradurga	Karnataka	II
Ahmedabad	Gujarat	III	Coimbatore	Tamil nadu	III
Ajmer	Rajasthan	II	Cuddalore	Tamil Nadu	III
Allahabad	Utter Pradesh	II	Cuttack	Orissa	III
Almora	Uttrakhand	IV	Darbhanga	Bihar	V
Ambala	Haryana	IV	Darjeeling	West Bengal	IV
Amritsar	Punjab	IV	Dharwad	Karnataka	III
Asansol	West Bengal	III	Dehradun	Uttrakhand	IV
Aurangabad	Maharashtra	II	Dharmपुर	Tamil Nadu	III
Baharich	Utter Pradesh	IV	Delhi	Delhi	IV
Bangalore	Karnataka	II	Durgapur	West Bengal	III
Barauni	Bihar	IV	Gangtok	Sikkim	IV
Bareilly	Utter Pradesh	III	Guwahati	Assam	V
Belgaum	Karnataka	III	Goa	Goa	III
Bhatinda	Punjab	III	Gulbarga	Karnataka	II
Bhilai	Chhattiagarh	II	Gaya	Bihar	III
Bhopal	Madhya Pradesh	II	Gorakhpur	Utter Pradesh	IV
Bhubaneswar	Orissa	III	Hyderabad	Andhra Pradesh/Telangana	II
Bhuj	Gujarat	V	Imphal	Manipur	V
Bijapur	Karnataka	III	Jabalpur	Madhya Pradesh	III
Bikaner	Rajasthan	III	Jaipur	Rajasthan	II
Bokaro	Jharkhand	III	Jamshedpur	Jharkhand	II
Bulandshahr	Utter Pradesh	IV	Jhansi	Utter Pradesh	II
Burdwan	West Bengal	III	Jodhpur	Rajasthan	II
Cailcut	Kerala	III	Jorhat	Assam	V
Chandigarh	Chandigarh	IV	Kakrapara	Gujarat	III
Chennai	Tamil Nadu	III	Kalapakka m	Tamil Nadu	III
Kanchipuram	Tamil Nadu	III	Pondicherry	Pondicherry	II
Kanpur	Utter Pradesh	III	Pune	Maharashtra	III

Karwar	Karnataka	III	Raipur	Chattisgarh	II
Kohima	Nagaland	V	Rajkot	Gujarat	III
Kolkata	West Bengal	III	Ranchi	Chattisgarh	II
Kota	Rajasthan	II	Roorkee	Uttrakhand	IV
Kurnool	Andhra Pradesh	II	Rourkela	Orissa	II
Lucknow	Utter Pradesh	III	Sadiya	Assam	V
Ludhiyana	Punjab	IV	Salem	Tamil Nadu	III
Madurai	Tamil Nadu	II	Simla	Himanchal Pradesh	IV
Mandi	Himanchal Pradesh	V	Sironj	Madhya Pradesh	II
Mangalore	Karnataka	III	Solapur	Maharastha	III
Monghyr	Bihar	IV	Srinagar	Jammu & Kashmir	V
Moradabad	Utter Pradesh	IV	Surat	Gujarat	III
Mumbai	Maharastha	III	Tarapur	Maharastha	III
Mysore	Karnataka	II	Tezpur	Assam	V
Nagpur	Maharastha	II	Thane	Maharastha	III
Nagarjunasagar	Telangana	II	Thanjavur	Tamil Nadu	II
Nainital	Uttrakhand	IV	Thiruvananthapuram	Kerala	III
Nasik	Maharastha	III	Tiruchirappali	Tamil Nadu	II
Nellore	Andhra Pradesh	III	Tiruvennamalai	Tamil Nadu	III
Osmanabad	Maharastha	III	Udaipur	Rajasthan	II
Panjim	Goa	III	Vadodara	Gujarat	III
Patiala	Punjab	III	Varanasi	Utter Pradesh	III
Patna	Bihar	IV	Vellore	Tamil Nadu	III
Pilibhit	Utter Pradesh	IV	Vijayawada	Andhra Pradesh	III
			Vishakhapatnam	Andhra Pradesh	II