

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 3220
TO BE ANSWERED ON WEDNESDAY, MARCH 16, 2016**

SEISMIC ZONING

3220. DR. J. JAYAVARDHAN:

SHRI BIDYUT BARAN MAHATO:

SHRIMATI POONAM MAHAJAN:

KUNWAR HARIBANSH SINGH:

SHRI ASHOK SHANKARRAO CHAVAN:

SHRI BHAIRON PRASAD MISHRA:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Bureau of Indian Standards (BIS) has classified the country into four major groups as per macro seismic zoning map of the country;**
- (b) if so, the details thereof, city/townwise;**
- (c) whether the Government has released a detailed report on 'seismic hazard microzonation' on major cities that fall in the different seismic zones across the country recently;**
- (d) if so, the factors that are taken into account before finalizing the buildings/localities which are vulnerable; and**
- (e) the steps taken/being taken by the Government to minimize the risk of life as well as property during earthquakes?**

ANSWER

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

- (a) Yes Madam.**
- (b) Bureau of Indian Standard [IS 1983 (Part I):2002] has grouped the country into four seismic zones viz. Zone-II, Zone-III, Zone-IV and Zone-V. Of these, Zone V is seismically the most prone region with higher incidence of activities of earthquakes and Zone II is the least prone region with lower incidents of activities of earthquakes.**

Broadly, Zone-V comprises of entire northeastern India, parts of Jammu and Kashmir, Himachal Pradesh, Uttaranchal, Rann of Kutch in Gujarat, part 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, Chhatisgarh, Maharashtra, Orissa, parts of Telangana, parts of Andhra Pradesh, Tamilnadu and Karnataka. Zone-II covers remaining parts of the country.

Important towns/urban areas in India, falling in seismic zones II, III, IV and V are in Annexure-I.

- (c) **The government has released detailed report on Seismic hazard microzonation of National Capital Territory (NCT) Delhi and Kolkata only.**
- (d) **The factors which were considered at sites for generation of seismic hazard index are as under;**
- **Peak ground acceleration at surface**
 - **amplification factor**
 - **Liquefaction potential**
 - **Engineering bedrock depth**
 - **Site classification based on shear wave velocity**
 - **Predominant frequency**
 - **Geology and geomorphology**

Based on above study, urban areas are divided into four hazard zones, namely; such as Least, Moderate, High and Very High.

- (e) **Bureau of Indian Standards (BIS) has published several guidelines and building codes for construction of earthquake resistant structures and for retrofitting of existing buildings. These guidelines are widely used by various administrative regulatory authorities responsible for ensuring the design and construction of earthquake resistant structures in various states.**

National Disaster Management Authority (NDMA), Ministry of Home Affairs (MHA), Ministry of Earth Sciences and other state Disaster Management Authorities, have also taken up various initiatives to educate and enhance awareness amongst general public and school children on the general aspects of earthquakes, their impacts and measures to mitigate losses caused by them. A National Disaster Response Force (NDRF) is also functional under the general superintendence, direction and control of the NDMA for the purpose of specialized response to natural and man-made disasters.

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	Maharastha	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	Kalpakkam	Tamil Nadu	III
Kanchipuram	Tamil Nadu	III	Pondicherry	Pondicherry	II

Kanpur	Utter Pradesh	III	Pune	Maharastha	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