

- (iii) A project to study climate change impacts on human, natural and spatial environment to the Centre for Environmental Planning and Technology (CEPT) University, Ahmedabad.
 - (iv) A project on Bio-fuel granted to Central Salt and Marine Chemicals Research Institute (CSMCRI), Bhavnagar (cost sharing by the Ministry of Earth Sciences and Council of Scientific and Industrial Research).
 - (v) Projects to Sardar Patel University and Gujarat University in focused areas of earth sciences.
 - (vi) Paleo-tsunami studies along the Gujarat Coast being carried out by M.S. University, Baroda.
 - (vii) Crustal deformations studies in Kutch and West Narmada by the Institute of Seismological Research, Gandhinagar.
 - (viii) Engineering site investigations for dam axis selection in the Gulf of Khambhat under the Kalpasagar Project.
 - (ix) Setting up of 8 Electronic Display boards at Bhadreshwar; Jakhao, Juna Bander, Mandvi, Nanalaija, Diu, Porbandar and Veraval of Gujarat for dissemination of information to fisherman community.
 - (x) Monitoring of marine pollution at three locations at Vadinar, Veraval and Hazira.
- (b) The Quantum of fund allocated for implementation of the above projects in Gujarat was Rs. 18.48 crore for the last 3 years, which has been built in the respective national programmes of the ESSO of this Ministry.
- (c) No Sir.

Earthquake prone States

1766. SHRIMATI NAZNIN FARUQUE : Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether a number of States in the country which fall in the earthquake zone;
- (b) if so, the details thereof, district-wise;
- (c) whether Government agencies have predicted earthquakes early;

(d) if so, the details thereof; and

(e) whether there is any further possibility of earthquakes in the immediate future in Assam?

THE MINISTER OF EARTH SCIENCES (SHRI S. JAIPAL REDDY) : (a) Yes, Sir.

(b) Bureau of Indian Standards [IS-1893 (Part-1): 2002], based on the past seismic history, grouped the country into four seismic zones, viz. Zones-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)	6 (or less)
III	(Moderate intensity zone)	7
IV	(Severe intensity zone)	8
V	(Very severe intensity zone)	9 (and above)

Broadly, Zone-V comprises of entire north-eastern India, parts of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Rann of Kutch in Gujarat, parts of North Bihar and Andaman and Nicobar Islands. Zone-IV covers remaining parts of Jammu and 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, Tamil Nadu and Karnataka. Zone-II covers remaining parts of the country.

(c) No technology/Science exists for prediction of earthquakes anywhere in the globe.

(d) Does not arise.

(e) In view of (c) above, pre-emptive actions are not possible to put in place in respect of dealing with earthquakes in general.