

**GOVERNMENT OF INDIA  
EARTH SCIENCES  
LOK SABHA**

STARRED QUESTION NO:481  
ANSWERED ON:10.05.2012  
EARTHQUAKE PRONE AREAS  
Thamaraiselvan Shri R.

**Will the Minister of EARTH SCIENCES be pleased to state:**

- (a) whether the Government has identified and mapped seismically vulnerable zones, including Eastern Coastal Areas;
- (b) if so, the details thereof;
- (c) whether the Government has taken note of three major earthquakes/Tsunami that shook Indonesia and sent tremors through Indian cities recently;
- (d) if so, the details thereof including damage/loss of life and property in the country; and
- (e) the pre-emptive measures taken for the safety of life and property in seismic prone areas of the country?

**Answer**

MINISTER OF SCIENCE & TECHNOLOGY AND MINISTER OF EARTH SCIENCES (SHRI VILASRAO DESHMUKH)

(a)&(e) A statement is laid on the Table of the House.

STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO (a) to (e) OF STARRED QUESTION No. 481 REGARDING "EARTHQUAKE PRONE AREAS" TO BE ANSWERED ON MAY 10, 2012

ANSWER

a) Yes Madam.

b) The coastal areas of India are prone to earthquakes of varying degrees of intensities. Bureau of Indian Standards [IS-1893 (Part-1): 2002], has grouped the country into four seismic zones viz. Zone-II, -III, -IV and -V. Of these, Zone V is the most seismically prone region, while zone II is the least. As per this seismic zoning, the various coastal areas fall in different seismic zones as per details given below:

Coastal Areas	Seismic zones
Andaman and Nicobar Islands	V
Gujarat	
# Kutch	V
# Parts of Jamnagar	IV
# Remaining Parts	III

Entire coastal areas of Daman & Diu	III
Coastal areas of Maharashtra	

# Parts of Ratnagiri and Raigarh	IV
# Remaining Parts	III

Entire coastal areas of Goa, Karnataka, Kerala & Lakshadweep	III
Coastal areas of Tamil Nadu	
# Parts of Tiruvallur, Kanchipuram and Kanyakumari	III
# Remaining Parts	II

Entire coastal areas of Pondicherry	II
Coastal areas of Andhra Pradesh	
# Parts of Nellore, Prakasam, Guntur, Krishna, East/West Godavari	III

# Remaining Parts II

Coastal areas of Odisha

# Parts of Puri, Jagatsinghpur and Kendrapara III

# Remaining Parts II

Coastal areas West Bengal

# Parts of North/South 24 Paraganas IV

# Midnapur III

c) Yes Madam.

d) Details of the major earthquakes recorded on 11th April 2012 are

i) Origin time: 14:09 hrs IST; Epicenter (Latitude & Longitude): 2.3o N & 93.0 o E; Focal depth: 10km; Magnitude: 8.5; Movement: Lateral

ii) Origin Time: 14:58 hrs IST; Epicenter (Latitude & Longitude): 1.4oN & 91.7oE; Focal Depth: 10Km; Magnitude: 6.8; Movement: Lateral

iii) Origin time: 16:13 hrs IST; Epicenter (Latitude & Longitude): 0.8o N & 92.4 o E; Focal Depth: 18km; Magnitude: 8.1; Movement: Lateral

e) Indian Tsunami Program is designed to strengthen continuously the nation's existing tsunami detection, warning, education, and preparedness efforts targeted along the vulnerable island and near-coastal areas. The operational Tsunami Early Warning and Spatial Decision Support System (SDSS) are only kicked-off after the detection of tsunami-triggering sea-bed earthquakes with 3-levels of advisories:

i) Tsunami Watch – Indicates area is either outside the warning and alert regions or tsunami poses no threat/danger to the area

ii) Tsunami Alert – Indicates efforts for organizing preparedness of the designated response system to be on advance alert in those areas that could be impacted by tsunami waves

iii) Tsunami Warning – Issued to coastal/island areas that are falling within 1h travel time of tsunami waves from the tsunami-triggering earthquake source or advisory issued after confirmation from water level data about the tsunami wave movement

In case of the Andaman & Nicobar Islands, as tsunami is expected to arrive in less than an hour after the tsunami-triggering sea-bed earthquake surrounding the Indonesian subduction zone, advisories are issued based on earthquake characteristics only. Accordingly, tsunami warning is issued to Andaman & Nicobar Islands authorities to organize stipulated relocation/evacuation of identified most vulnerable communities to safer areas.

Events at S. No. i) and iii), detailed out at Para (d) above, were considered to be potentially tsunamigenic. The tsunami warning centre, operational at the Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, issued advisories to the concerned authorities (the designated central Ministries and officials; 24X7 control rooms, state and district level Disaster Management Offices etc.). The above events were detected within 4mins of their occurrence and subsequently, first bulletin, for the first event, was issued within 8-mins at 1416h and second at 1420h. Similarly, due bulletins were issued for the 3rd event.

Tsunami warning was issued for the 3-islands of Andaman & Nicobar-Indira Point; Little Nicobar; Komatra and Katchal. Tsunami alerts were also issued for other islands of Andaman & Nicobar, Tamilnadu, Andhra Pradesh and Odisha coasts and parts of Kerala and Lakshadweep. After ascertaining the observational data related to sea level, the warnings/alerts were withdrawn at 18:18h.

No technology/Science exists for prediction of earthquakes any where in the globe and hence pre-emptive measures are not possible to put in place in respect of dealing with earthquakes. However, National Disaster Management Authority (NDMA) has issued guidelines for minimizing the loss of life and damage to property.