

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. 962
TO BE ANSWERED ON THURSDAY, MARCH 09, 2017**

FORECAST OF EARTHQUAKES AND CLOUD BURST

962. SMT. VIPLOVE THAKUR:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the technology used by the Indian Meteorological Department (IMD) to forecast and prevent earthquake and cloud-burst situations in the country;**
- (b) whether Government is planning to improve the current forecasting technology so as to predict and prevent wide scale destruction from earthquakes and cloud-bursts in the country, especially in Uttarakhand and Himachal Pradesh; and**
- (c) if so, the details thereof and if not, the reasons therefor?**

ANSWER

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

- (a) At present, there is no scientific technique available anywhere in the world to predict the occurrence of earthquakes with reasonable degree of accuracy with regard to space, time and magnitude. Nevertheless, efforts are being made world-over including India, to monitor and study various earthquake precursory phenomena in critical seismotectonic regions, which would not only help understand the earthquake generation processes better but also lead to identifying possible earthquake precursors, which may serve as useful predictors in future.**

Cloudburst is short lived extreme weather event in which, heavy rainfall occurs over a localised area at a faster rate (100mm/hr). In India cloudbursts occur during monsoon season over orographically dominant regions like Himalayan region, northeastern states and Western Ghats. Accurate prediction of cloud burst is a challenging task not only in India but world over. This is mainly attributed to small size, short duration and sudden development characteristic of the event and also due to the complexity of associated atmospheric processes which prevail in tropical regions like India.

(b-c) National Centre for Seismology (NCS) maintains a country wide network to detect and locate earthquakes occurring in and around the country and disseminates information to the concerned disaster management authorities and other user agencies in the least possible time. A 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 in the Indian Coastal region by large magnitude under sea earthquakes.

In order to minimize hazards due to earthquake, seismic hazard vulnerability of the country has been assessed and seismic zoning map of India has been prepared by Bureau of Indian Standard(BIS) [IS 1983 (Part I):2002]. The country is grouped into four seismic zones viz. Zone-II, -III, -IV and -V. Of these, Zone V is seismically the most prone region, while Zone II is the least. The regions of Uttarakhand and Himanchal Pradesh fall in seismic zone IV and V. BIS has published criterion for construction of earthquake resistant structures and guidelines for retrofitting in existing structures. In addition to this, Housing and Urban Development Corporation & Building Materials Technology Promotion Council (HUDCO & BMTPC) have also published guidelines and brochures for construction and retrofitting of buildings.

The conditions leading to cloud burst phenomena are monitored by using satellite data and Doppler Weather Radar (DWR) data, which can be used for nowcasting (3-6 hour forecasts) of cloudburst. India Meteorological Department (IMD) is also attempting to increase the accuracy of prediction of cloudbursts by employing state of the art high resolution numerical models.
