

1	2	3	4	5
42.	Department of Rural Development	3380.50	3780.50	4164.50
43.	Department of Land Resources	157.28	154.00	165.00
44.	Department of Biotechnology	160.68	160.68	180.00
45.	Ministry of Shipping	93.28	81.00	100.00
46.	Ministry of Skill Development and Entrepreneurship	150.00	100.00	0.00
47.	Department of Social Justice and Empowerment	236.43	229.13	245.20
48.	Department of Empowerment of Persons with Disabilities	57.29	54.00	70.00
49.	Ministry of Statistics and Programme Implementation	40.25	21.50	30.00
50.	Ministry of Textiles	352.33	331.54	335.00
51.	Ministry of Tourism	128.00	85.00	150.00
52.	Ministry of Tribal Affairs	479.22	429.22	449.00
53.	Ministry of Urban Development	100.00	100.00	100.00
54.	Ministry of Water Resources, River Development and Ganga Rejuvenation	361.00	213.60	261.36
55.	Ministry of Women and Child Development	1028.70	1731.80	1730.00
56.	Ministry of Youth Affairs and Sports	150.23	89.60	120.30
GRAND TOTAL		29087.93	29669.22	33097.02

### Research on earthquake risk mitigation

†1768. SHRI PRABHAT JHA: Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether special emphasis was laid on seven core research areas under Twelfth Five Year Plan to promote research work related to mitigation of earthquake risks which yielded positive outcomes, if so, the details thereof; and

† Original notice of the question was received in Hindi.

(b) whether the research work on earthquake risk mitigation during the last two years has been expedited and made more comprehensive than before and if so, the details thereof?

THE MINISTER OF STATE IN THE MINISTRY OF EARTH SCIENCES (SHRI Y. S. CHOWDARY): (a) Yes, Sir. The seven core research areas under twelfth five year plan to promote research work related to the earthquake hazards are as follows:

- Observational Networks and Data Centre,
- Seismicity and Earthquake Precursors,
- Earthquake Hazard Assessment
- Deep Borewell Investigations in Koyna
- Deep Crustal Studies
- Development of Geotechnology
- Setting up National Centre for Seismology

The National Center for Seismology (NCS) was created as an attached office of Ministry of Earth Sciences in August 2014 with the objectives:

- Provide earthquake (M:3.0 and above) related information to all user agencies in shortest possible time.
- Provide earthquake hazard and risk related products of specific regions required by various agencies as mitigative measures for design and construction of earthquake resistant structures, land use planning and for enacting building bye-laws towards minimizing damage to property and loss of lives due to earthquakes.
- Carry out research in pure and applied seismology and earthquake precursory phenomena, earthquake processes and modeling.

The core areas of “Observational Networks and Data Centre” and “Earthquake Hazard Assessment” have been brought under NCS. These core areas have yielded positive outcome with regard to mitigation of earthquake hazard and risk.

Under observational “Observational Networks and Data Centre”, 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 communications 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 for

relief and rescue operations in hour of need. The network also includes a 17-station real time seismic monitoring system to monitor and report large magnitude under sea earthquakes capable of generating tsunamis on the Indian coastal regions. 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 on the Indian Coastal areas by large magnitude under sea earthquakes. A state-of-art Data Centre has been created in NCS for archival of ground motion data generated by the NSN for further use in seismological research and earthquake hazard mitigation related programs.

(b) The NSN is under up-gradation by putting 38 more state-of-art seismograph stations and strengthening the real time monitoring of earthquake activities in the country.

Seismic hazard microzonation is very useful in planning hazard reduction due to earthquakes. It will provide earthquake hazard and risk related products of specific regions required by various agencies as mitigative measures for design and construction of earthquake resistant structures, land use planning and for enacting building bye-laws towards minimizing damage to property and loss of lives due to earthquake.

Seismic microzonation of NCT Delhi has been completed on 1:10000 scale and report has been released in February for stake holders including Governments. Seismic microzonation of Jabalpur, Guwahati, Bangalore, Sikkim, Ahmedabad, Gandhidham-Kandla, Kolkata and Mumbai has been completed. The seismic microzonation of thirty more cities lying in seismic zone III, IV and V and having population more than half a million is under consideration.

#### **Upgradation of forecast system of IMD**

1769. SHRI T. RATHINAVEL: Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether it is a fact that the Indian Meteorological Department (IMD) is planning to shift next year to forecast system that relied on a supercomputer led dynamical weather modeling;

(b) whether it is also a fact that IMD's weather forecast has been proving wrong constantly in recent times;

(c) whether it is also a fact that even the IMD's forecast for August, 2016 went wrong; and

(d) if so, the steps taken by Government in this regard?