

Report on Real Time Earthquake Location

**From: Earthquake Monitoring Center (EMC) of NCS
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Report of Earthquakes occurred in the month of November 2023

1) Introduction:

National Center for Seismology maintains a National Seismological Network of **155 stations** each having state of art equipment and spreading all across the country (**Figure:1**). Using these stations during the period 01st – 30th November 2023 a total number of **198** earthquakes have been located and disseminated from the center (**Figure:2**), out of which **183** earthquakes have

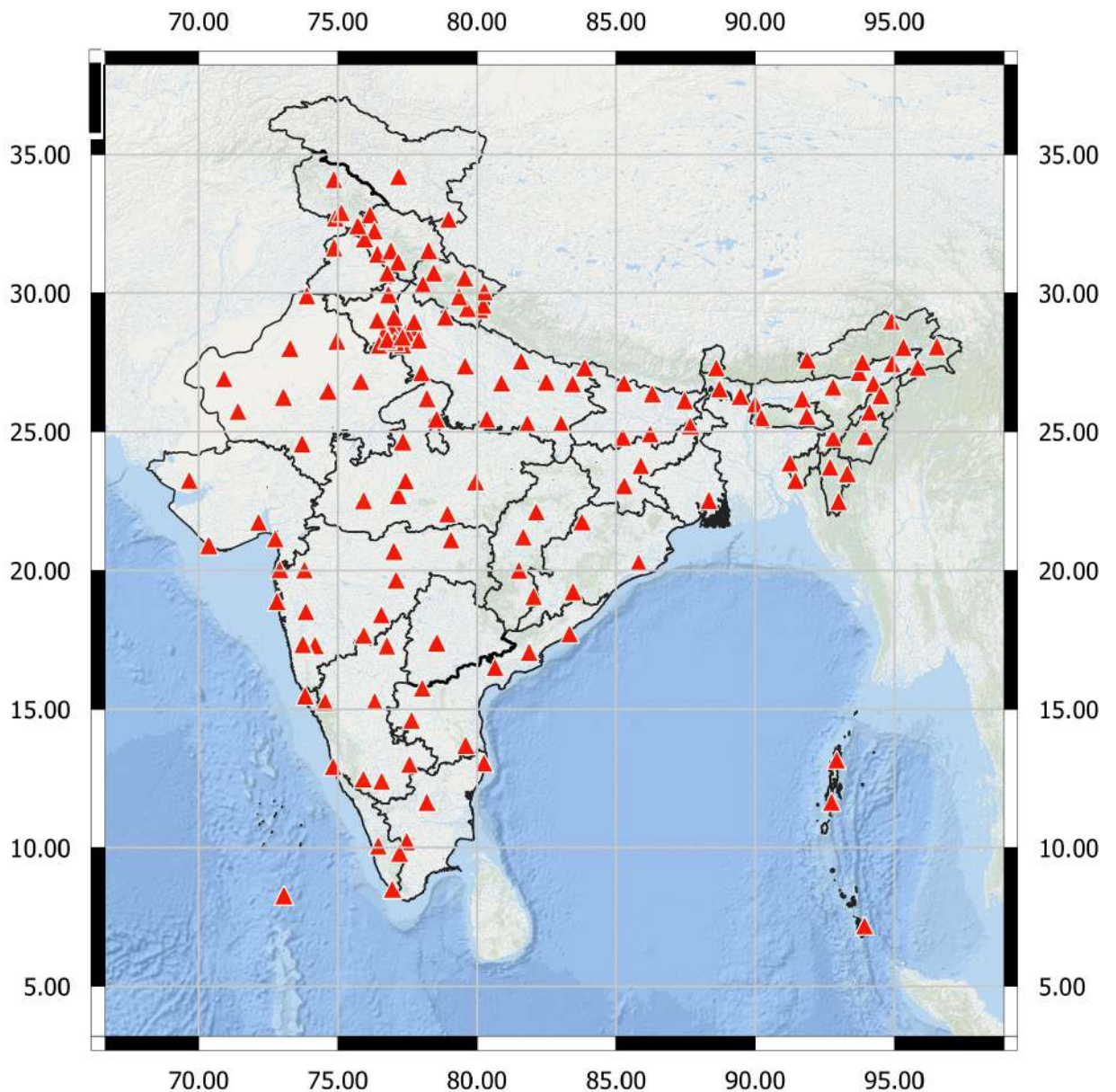


Figure 1: National Seismological Network (NSN) of 155 Stations

occurred in India and its neighborhood region bounded by the coordinates 0°- 40°N & 60°-100°E (Figure:3).

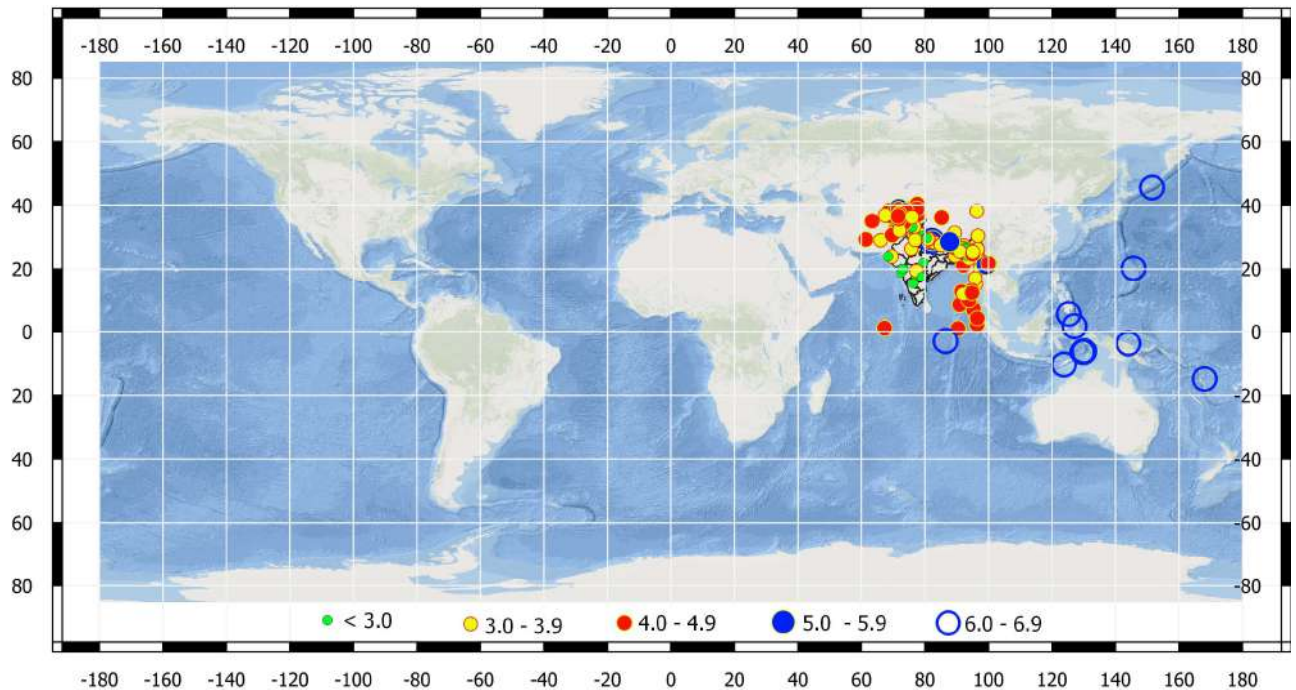


Figure 2: Earthquakes located and disseminated by NCS during 01st – 30th November 2023

2) Seismicity:

During the period, the majority of earthquakes within India and its neighbourhood region bounded by the coordinates 0-40°N & 60-100°E; were located in Hindu Kush region, North India (Jammu and Kashmir, Ladakh, Himachal Pradesh and Uttarakhand) and North East India (Arunachal Pradesh, Assam, Manipur and Meghalaya) as shown in **Figure 3**.

Few earthquakes of smaller magnitudes were also reported in northern (Delhi; Sonipat in Haryana and Rupnagar in Punjab), western (Tonk in Rajasthan; Kachh in Gujrat; Palghar and Hingoli in Maharashtra); central (Seoni in Madhya Pradesh); eastern (Kalimpong and Alipurdwār in West Bengal) and southern (Bidar and Vijayanagara in Karnataka; Rangareddy and Yadadri Bhuvanagari in Telangana) part of country.

Fifty-two earthquakes of smaller magnitude (**M < 3.0**) comprising **26%** of all earthquakes occurred during 01st to 30th November 2023. **Seven** earthquakes of magnitude **M:5.0 and above** occurred during the month in the region; as detailed in **Table:1**.

Table:1 Earthquakes of $M \geq 5.0$ occurred during November 2023 within India and its neighbourhood

SN	Date	Time (IST)	Lat($^{\circ}$ N)	Long($^{\circ}$ E)	D (KM)	M	Region
1	2023-11-01	18:21:14	11.17	92.99	120	5.0	Andaman Islands, India
2	2023-11-03	23:32:54	28.84	82.19	10	6.4	Nepal
3	2023-11-06	16:16:40	28.89	82.36	10	5.6	Nepal
4	2023-11-15	05:35:06	35.96	71.58	18	5.2	Pakistan
5	2023-11-17	07:07:11	21.32	99.32	10	5.6	Myanmar
6	2023-11-23	15:31:52	38.85	71.79	20	5.0	Tajikistan
7	2023-11-28	03:45:44	28.57	87.80	140	5.0	Xizang

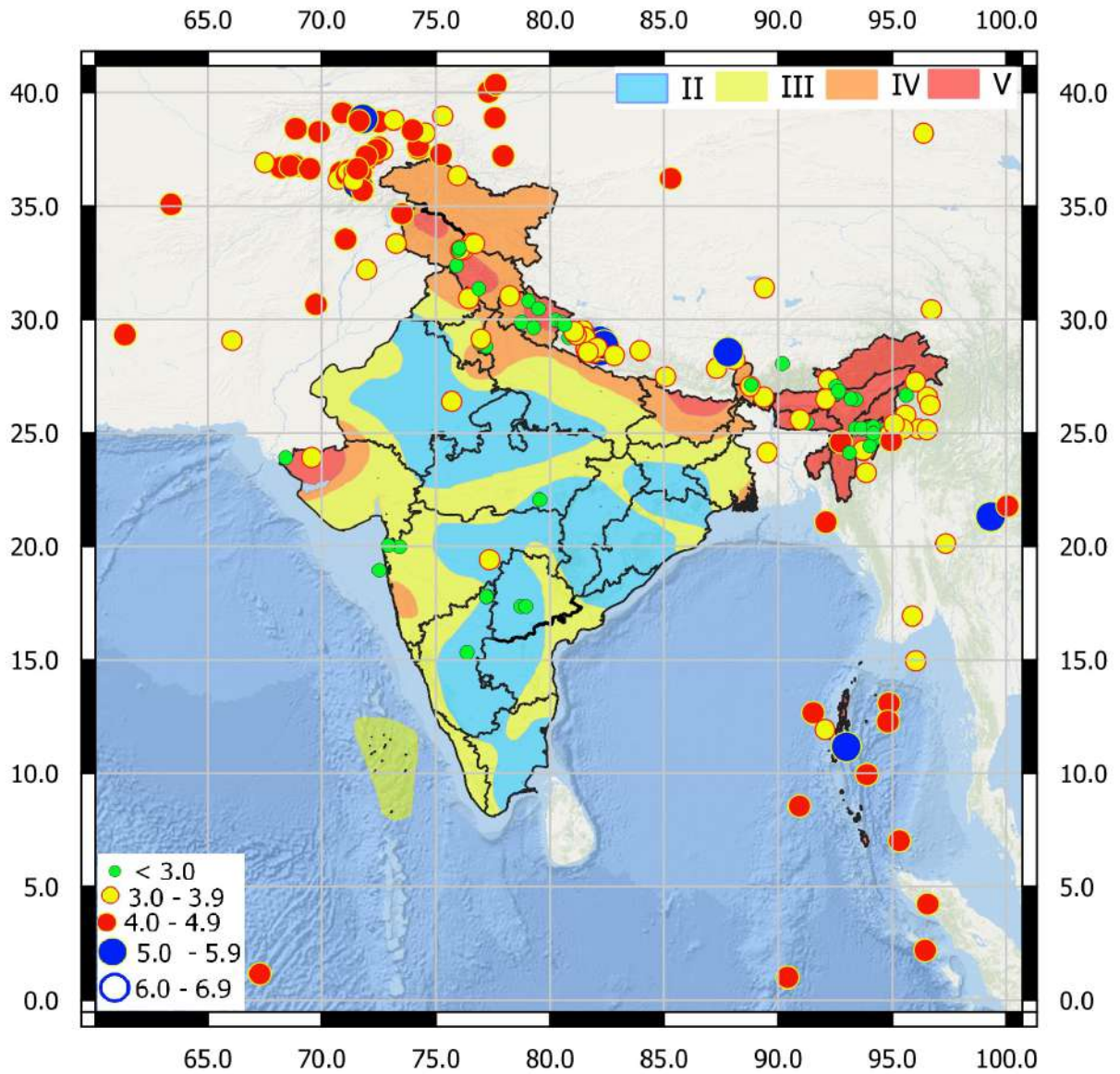


Figure 3: Map showing the seismicity during the period 01st – 30th November 2023 occurred in India and its neighbourhood region along with the seismic zone of India.

Out of total 198 earthquakes; 39% and 25% earthquakes occurred in the magnitude range 3.0-3.9 and 4.0 - 4.9 respectively; whereas six earthquakes in the magnitude range 5.0-5.9 occurred

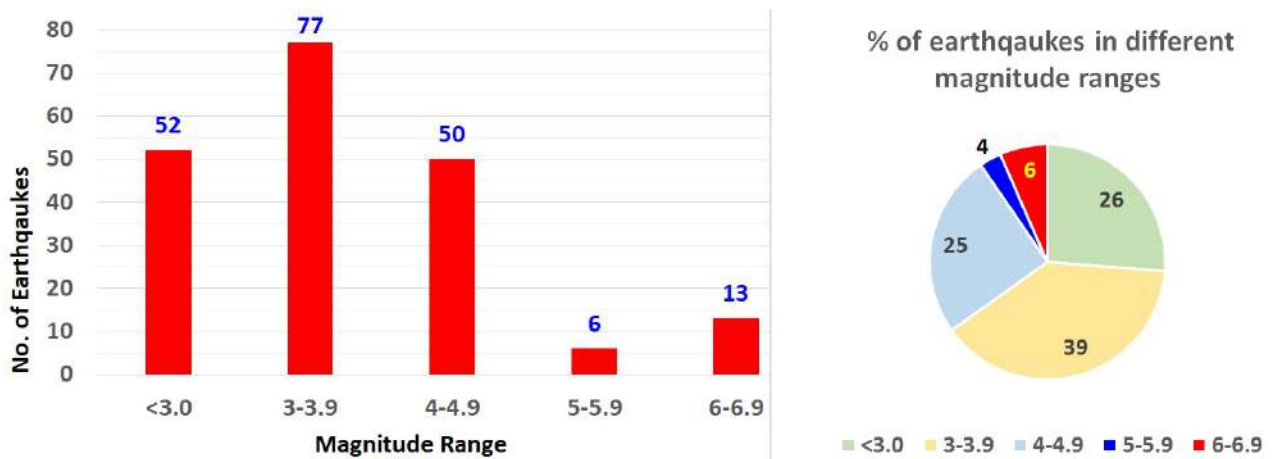


Figure 4: Distribution of earthquakes in the different magnitude range during 01st-30th November 2023.

within the grid of 0-40°N & 60-100°E during the period as shown in Figure:3 and Figure:4. Thirteen earthquakes occurred in the magnitude range of 6.0-6.9 of which twelve were outside the grid of 0- 40°N & 60-100°E as shown in Figure:2 and Figure:4. Detail list of earthquakes occurred during the month is available at www.seismo.gov.in

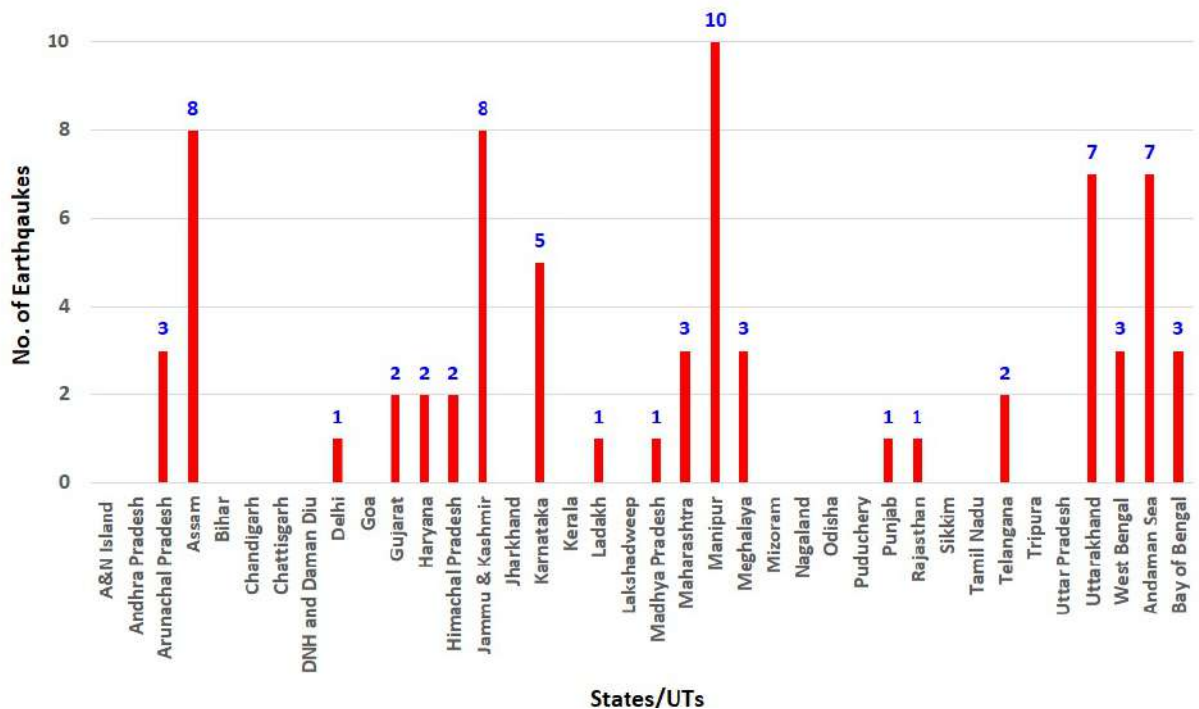


Figure 5: State wise distribution of earthquakes during the period 01st - 30th November 2023.

Total **73** earthquakes occurred within Indian Territory; of which 10 earthquakes were occurred in Manipur and 8 each were in Assam and Jammu & Kashmir during the period. Out of 73 earthquakes **22** and **24** earthquakes occurred in **North** and **North-East** region respectively. State/UT and region wise distribution of earthquakes occurred during 01st – 30th November 2023 is shown in **Figure 5** and **Figure 6** respectively.

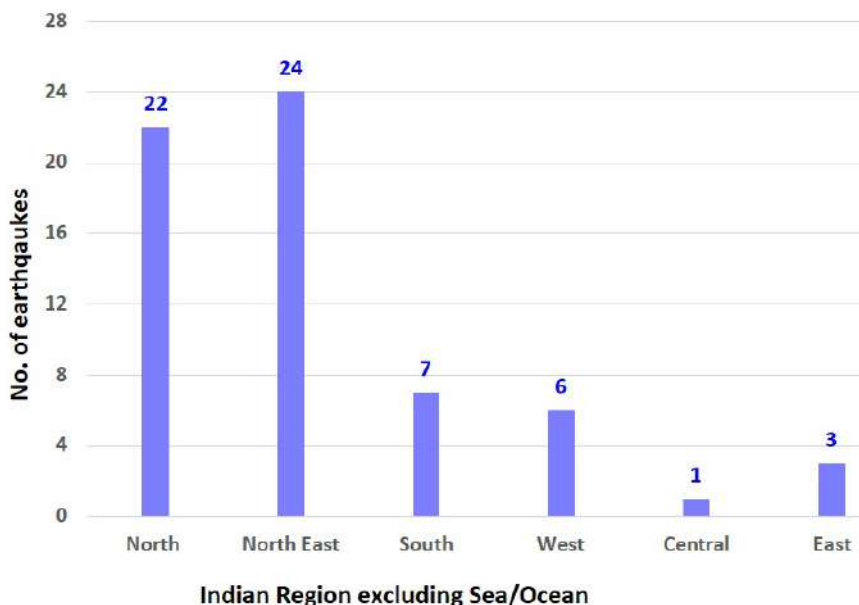


Figure: 6 Region wise distribution

3) Significant Activity:

Nepal Earthquake: An earthquake of **M:6.4** occurred at **23:32:54 IST** of **03rd November 2023** in western Nepal at 28.84°N and 82.19°E with focal depth of 10 km. The epicentre is about 140 Km NE of Baharaich; 208 Km ESE of Pithoragarh; 240 Km NNE of Lucknow; 330 Km NW of Kathmandu and 490 Km E of Delhi. Two aftershocks of magnitude M:4.1 and 3.7 is also occurred within 30 minutes of the occurrence of mainshock. The area is seismically very active associated with collisional tectonics where Indian plate colliding with Eurasian Plate. **Figure 7** depicts the expected intensity of this earthquake around the source zone. This earthquake was widely felt in Delhi, Uttar Pradesh, Haryana, Bihar, Uttarakhand and Rajasthan as per the felt responses received through our website and mobile app

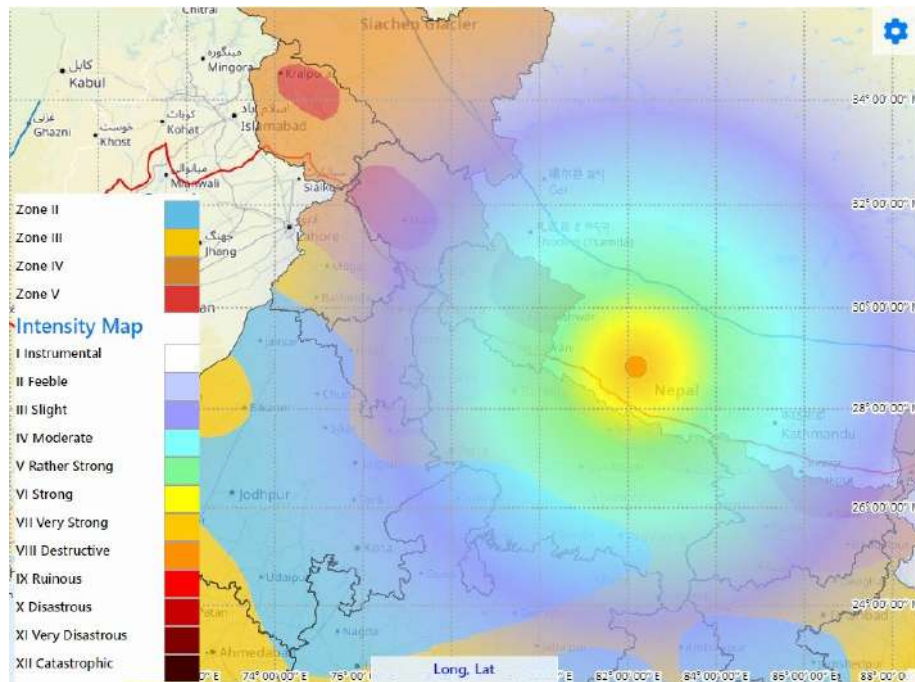


Figure 7: Intensity map of M:6.4 Nepal Earthquake

(Figure 8). More detailed information about this earthquake is available at the URL <https://riseq.seismo.gov.in/riseq/earthquake/event/RC9tRm8rd1hMaXNFcjhKUjd1bWFwUT09/Reviewed> .

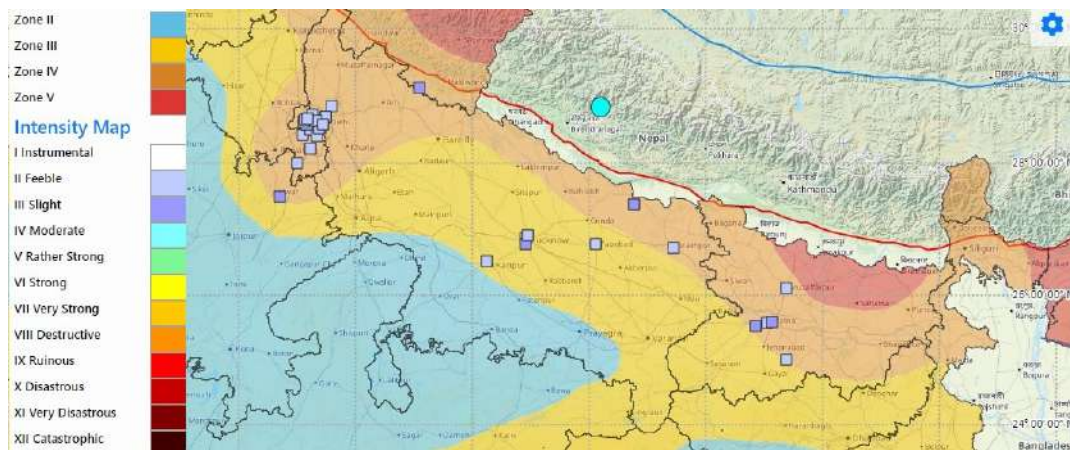


Figure 8: Felt response of M:6.4 Nepal earthquake

4) Dissemination Performance:

More than **80%** earthquakes of **M<5.0** occurred within India and its neighbourhood region bounded by the coordinates 0-40°N & 60-100°E were disseminated within 10 Minutes. More than

70% earthquakes of $M \geq 5.0$ occurred within India and its neighbourhood region bounded by the coordinates $0-40^\circ\text{N}$ & $60-100^\circ\text{E}$ were disseminated within 15 minutes as shown in **Figure 9**.

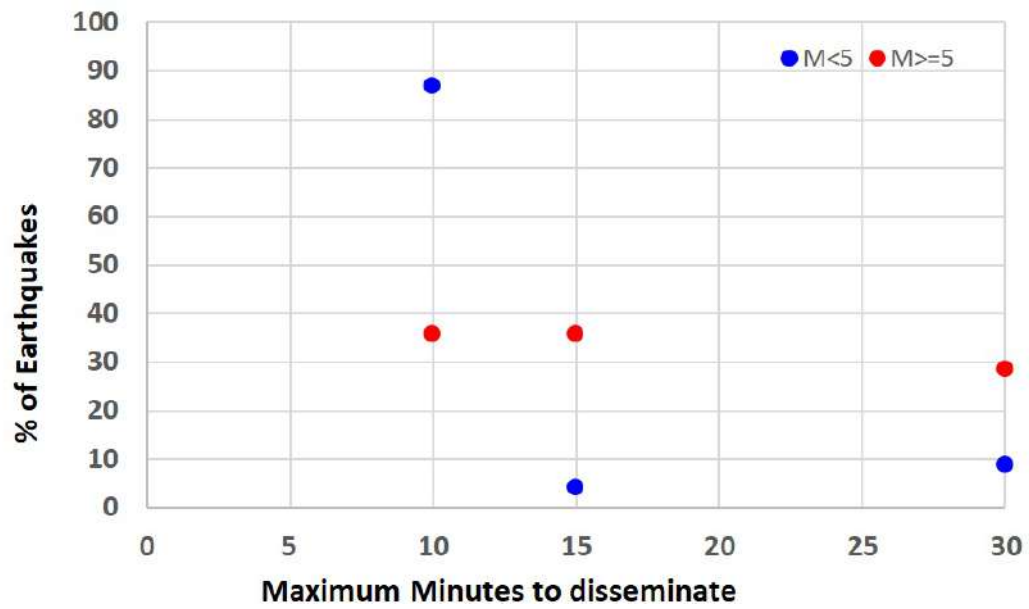


Figure 9: Dissemination of earthquakes within different time ranges (in minutes) during 01st – 30th November 2023.