

Report on Real Time Earthquake Location

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Report of Earthquakes occurred in the month of January 2025

1) Introduction:

National Center for Seismology maintains a National Seismological Network of **166 stations** each having state of art equipment and spreading all across the country (**Figure:1**). Using these stations during the period 01st – 31st January 2025 a total number of 340 earthquakes have

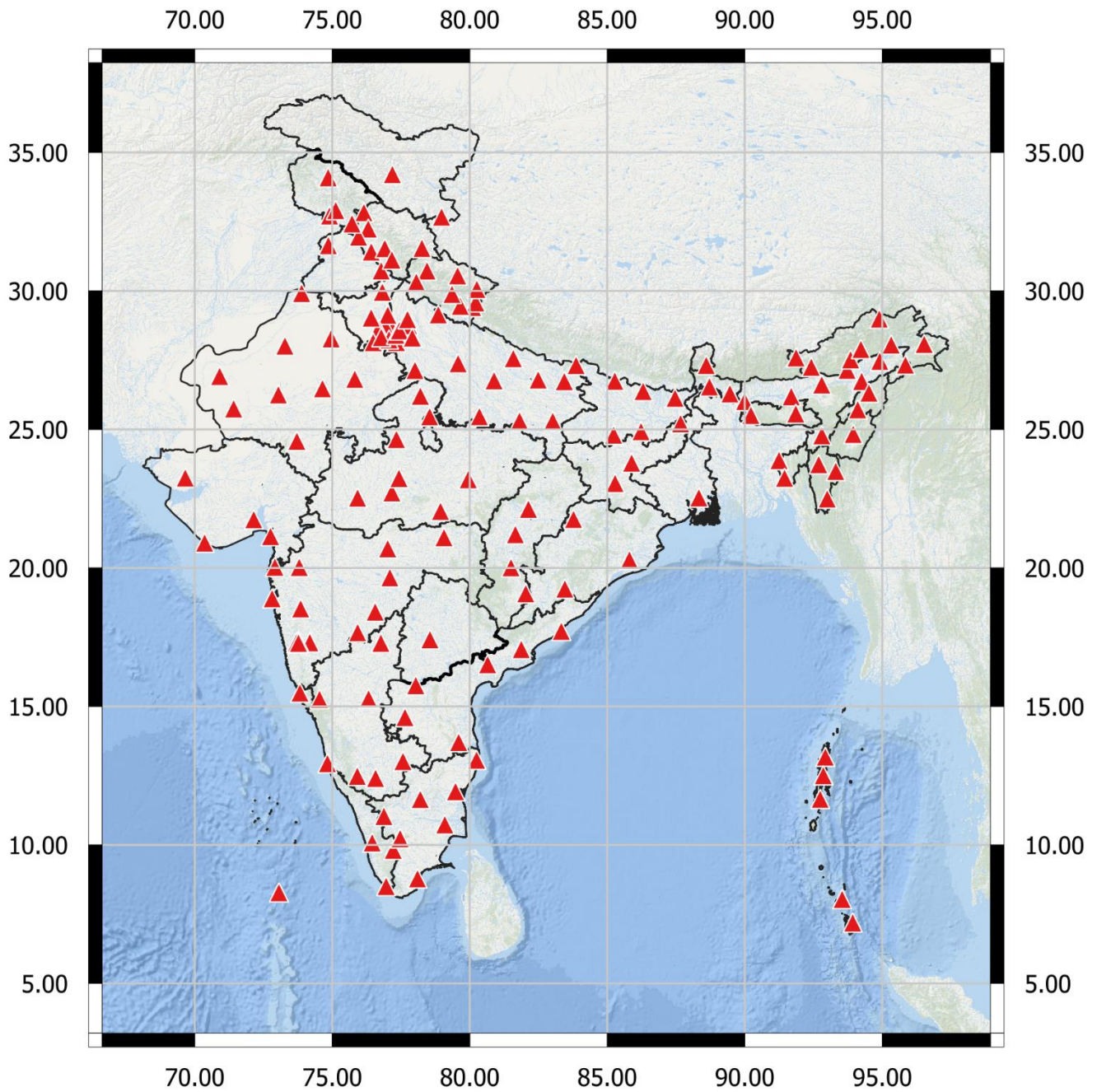


Figure 1: National Seismological Network (NSN) of 166 Stations

been located and disseminated from the center (**Figure:2**), out of which 334 earthquakes has occurred in India and its neighborhood region bounded by the coordinates 0° - 40°N & 60° -100°E (**Figure:3**).

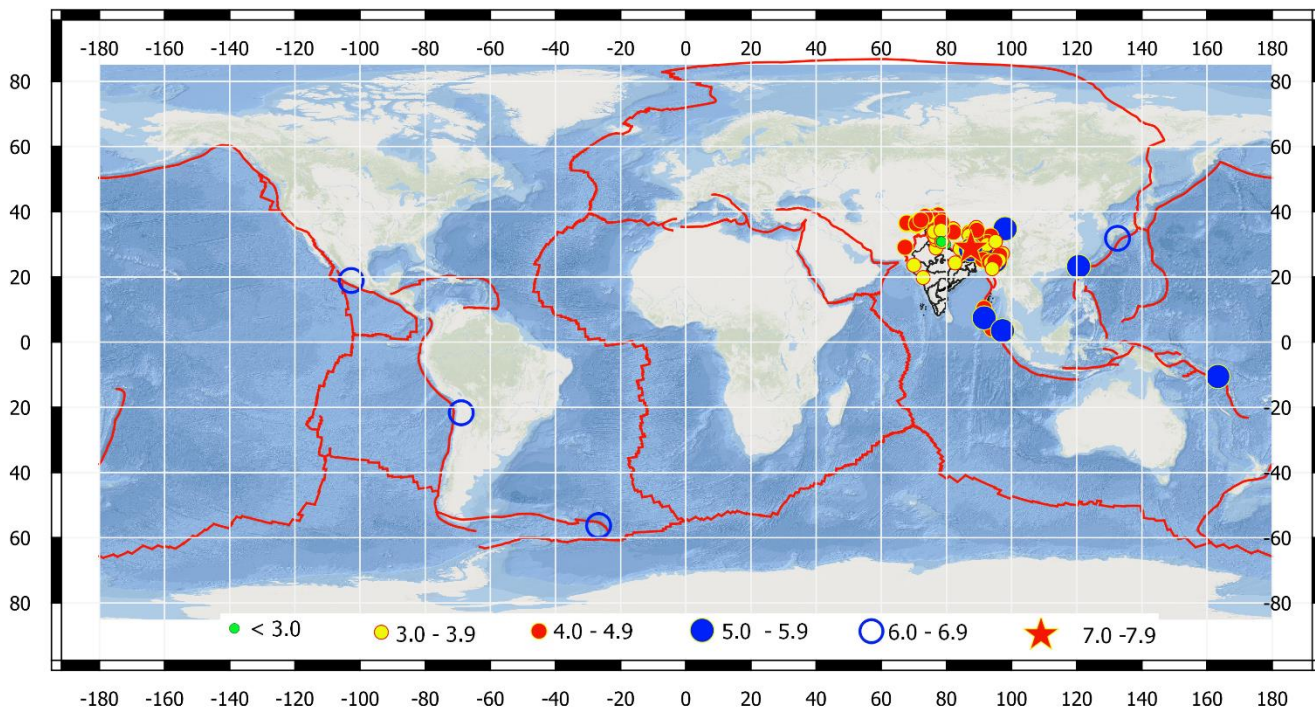


Figure 2: Earthquakes located and disseminated by NCS during 01st – 31st January 2025

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), North East India (Arunachal Pradesh, Assam, Meghalya and Manipur) as shown in **Figure 3**.

Few earthquakes of smaller magnitudes were also reported in northern (Sonipat in Haryana), western (Kachchh in Gujrat and Palghar in Maharashtra) and central (Singrauli in Madhya Pradesh) part of country. **Twenty three** earthquakes of smaller magnitude (**M < 3.0**) comprising **7%** of all earthquakes occurred during 01st to 31st January 2025.

Eight 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 January 2025 within India and its neighbourhood

SN	Date	Time (IST)	Lat($^{\circ}$ N)	Long($^{\circ}$ E)	D (KM)	M	Region
1	2025-01-03	10:02:40	24.92	94.97	127	5.1	Myanmar
2	2025-01-07	06:35:18	28.86	87.51	10	7.1	Tibet
3	2025-01-07	07:13:52	28.60	87.51	7	5.0	Tibet
4	2025-01-08	13:14:23	34.78	98.04	156	5.3	Qinghai, China
5	2025-01-13	18:27:40	28.39	87.39	10	5.2	Tibet
6	2025-01-20	16:50:39	7.45	91.60	30	5.0	Andaman Sea
7	2025-01-21	02:33:12	28.30	87.46	10	5.0	Tibet
8	2025-01-31	16:33:45	3.51	97.22	83	5.5	Northern Sumatra, Indonesia

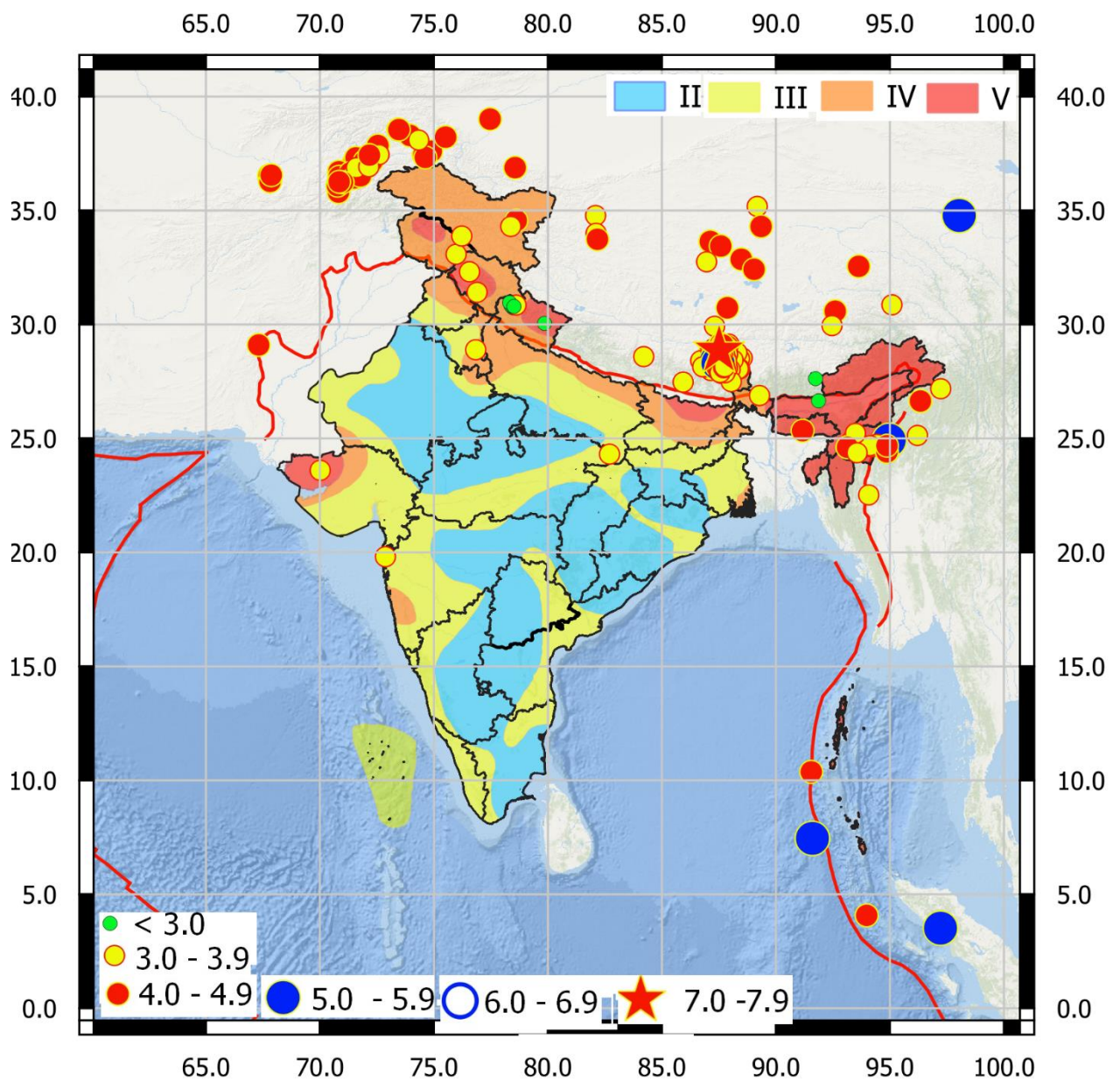


Figure 3: Map showing the seismicity during the period 01st – 31st January 2025 occurred in India and its neighbourhood region along with the seismic zone of India.

Out of total 340 earthquakes **59%** and **30%** earthquakes occurred in the magnitude range **3.0-3.9** and **4.0-4.9** respectively; whereas **nine** earthquakes in the magnitude range 5.0-5.9 occurred during the period of which two were outside the grid of 0- 40°N & 60-100°E as shown in **Figure 2**. All the **four** earthquakes in the magnitude range of **6.0-6.9** and were occurred outside the grid of 0- 40°N & 60-100°E; as shown in **Figure 2** and **Figure 4(a)**. One earthquake of magnitude of **M:7.1** occurred in Tibet region within the grid of 0- 40°N & 60-100°E as shown in **Figure 3**. Detail list of earthquakes occurred during the month is available at www.seismo.gov.in .

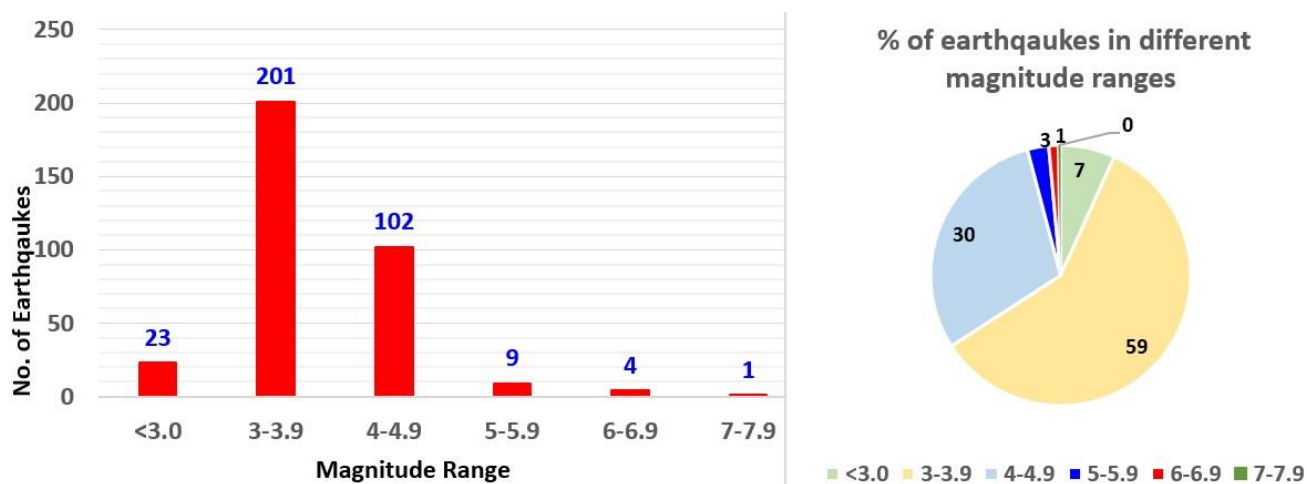


Figure 4 (a) : Distribution of earthquakes in the different magnitude range during 01st – 31st January 2025.

There is positive change in number of earthquakes with respect to previous month (December 2024) in the all the magnitude range; except of 6.0 -6.9 and 7.0 – 7.9 as shown in **Figure 4 (b)**.

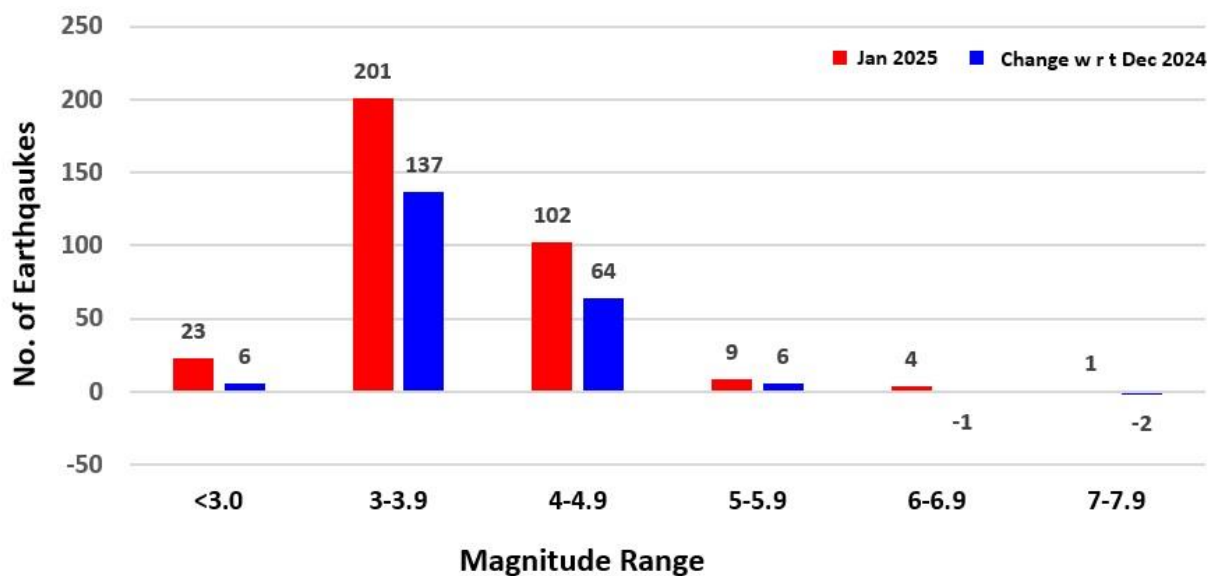


Figure 4 (b) : Change of occurrence of earthquakes in different magnitude ranges w r t previous month

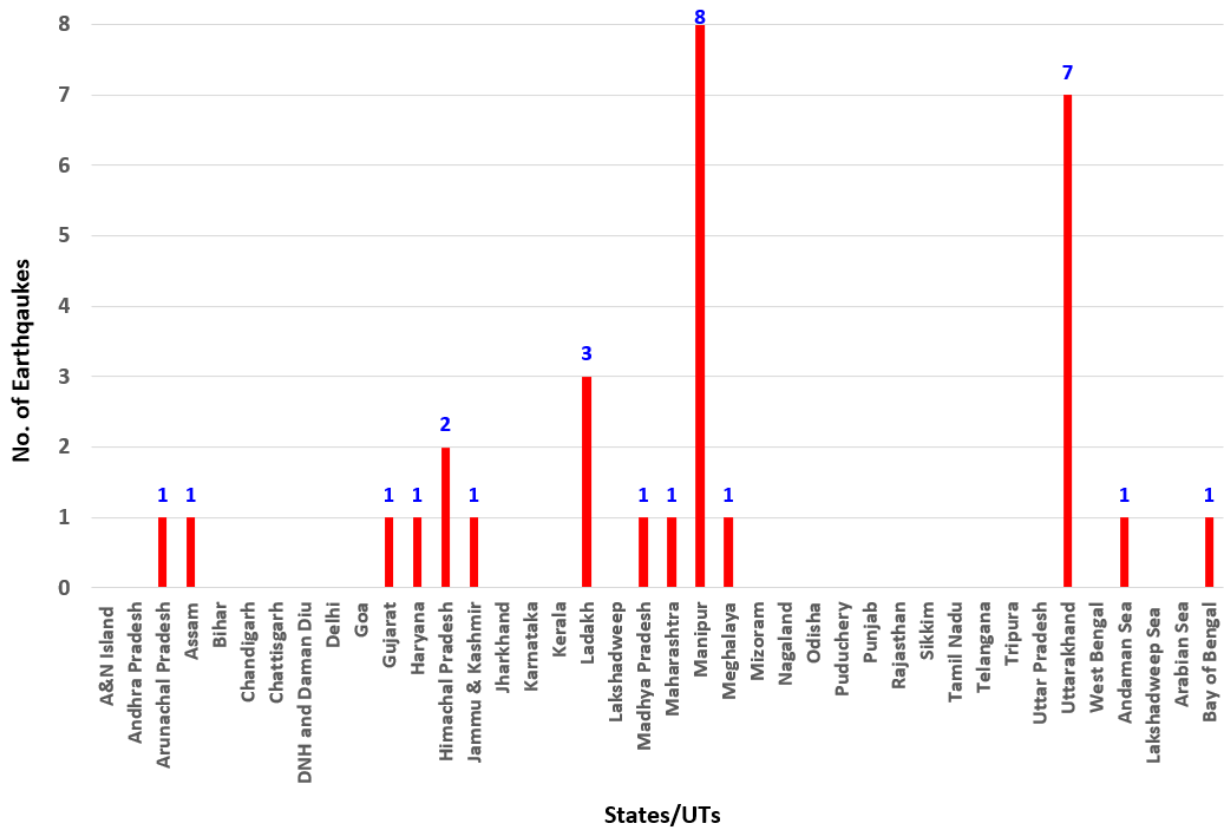


Figure 5: State wise distribution of earthquakes during the period 01st – 31st January 2025.

Total 30 earthquakes occurred within Indian territory; of which 8 earthquakes occurred in Manipur and 7 in Uttarakhand during the period. Out of 30 earthquakes 14 and 11 earthquakes occurred in **North** and **North-East** region respectively. State/UT and region wise distribution of earthquakes occurred during 01st – 31st January 2025 is shown in **Figure 5** and **Figure 7** respectively. There was sparse activity in central and western part of the country and no activity reported in southern and eastern part of the country during the 01st – 31st January 2025 (**Figure 3** and **Figure 6**).

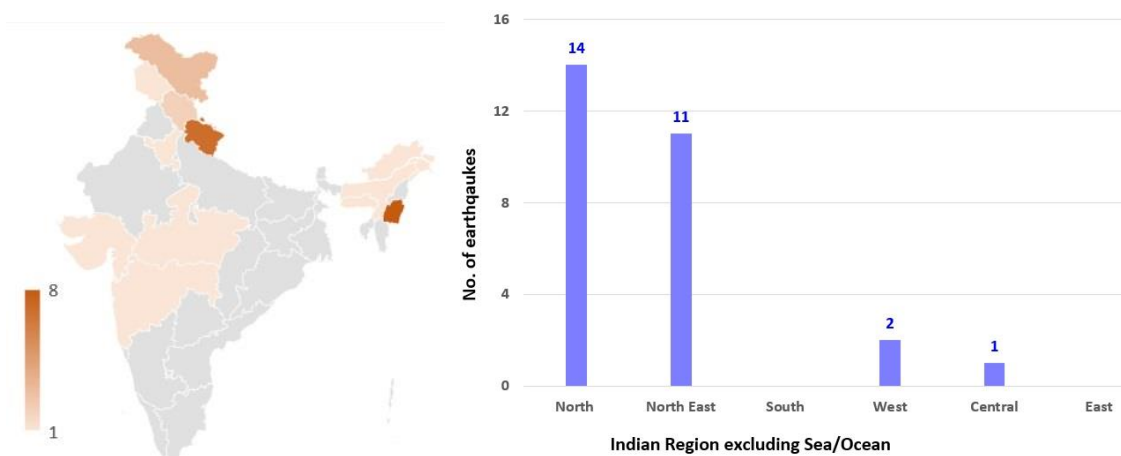


Figure: 6 Earthquake Density map

Figure: 7 Region wise distribution

3) Significant Activity:

Tibet Earthquakes: An earthquake of **M:7.1** occurred at **06:35:18 IST** of **07th January 2025** in Tibet autonomous Region(TAR) at **28.86° N** and **87.51° E** with focal depth of 10 km. The epicentre was approximately 100 km northeast of Lobuche, Nepal; 175 km northwest of Gangtok, Sikkim; 430 km northeast of Patna, Bihar; 525 km northwest of Guwahati; and 380 km from Lhasa, the capital city of Tibet. The epicentre of the earthquakes lies close to the ITSZ (Indus-Tsangpo Suture Zone), situated along the Indian-Eurasian plate boundary. Preliminary fault plane analyses suggest that the earthquakes were caused by normal faulting at shallow depths. The fault plane solution indicates that the rupture occurred along a plane oriented approximately in the North-South direction. This observation is strongly supported by the distribution of aftershocks, which aligns well with the inferred fault geometry. **Figure 8** depicts the expected intensity of this earthquake around the source zone. The earthquake was widely felt across several states in eastern and northeastern India, including Bihar, Sikkim, Assam, and West Bengal, as well as neighbouring regions. More than 250 aftershocks were reported during 7th to 31st Jan 2025 with in the magnitude range M:2.8 to M:5.2. There were four aftershocks recorded in the magnitude range of 5.0-5.9; and within one hour of mainshock an aftershock of M:5.0 occurred. **Temporal** and **spatial** distribution of aftershocks is shown in **Figure 9** and **Figure 10** respectively. More information about this earthquake is available at the URL <https://riseq.seismo.gov.in/riseq/earthquake/event/cfPajh0VCs4ZWV3Qmt2SzBkVjI4QT09/Reviewed> .

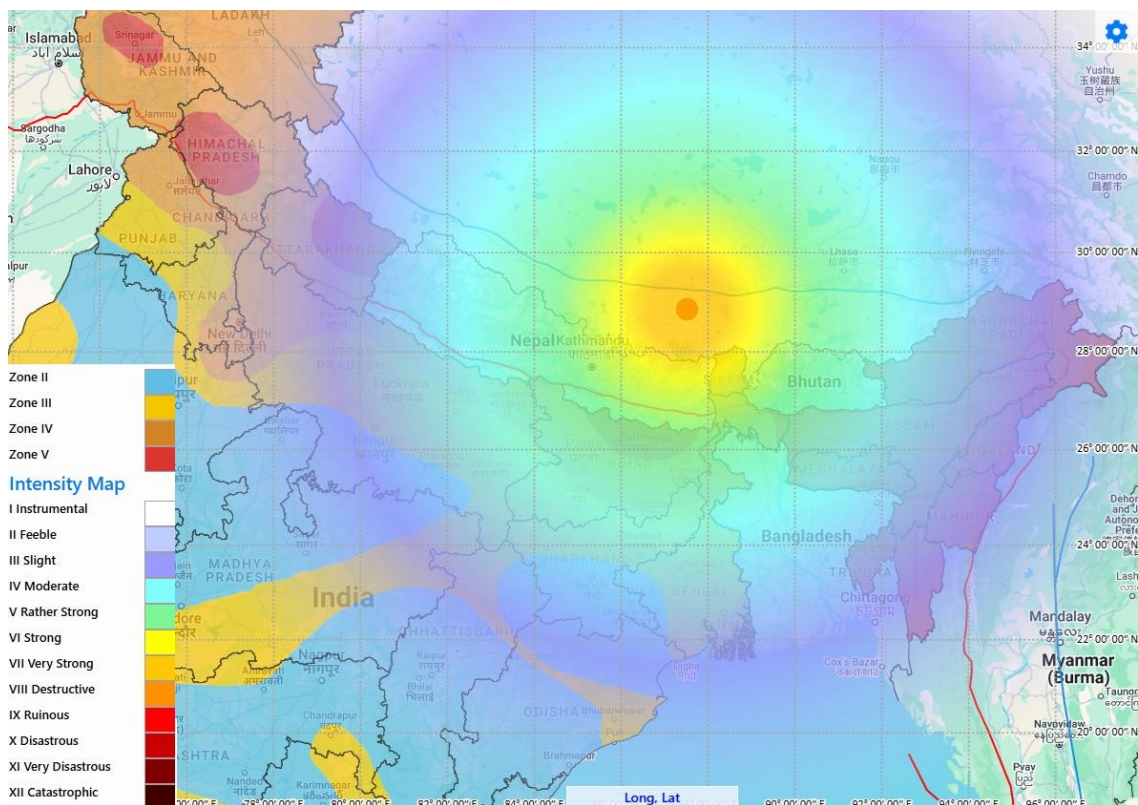


Figure 8: Intensity map of earthquake of M 7.1 occurred on 7th January 2025 in Tibet.

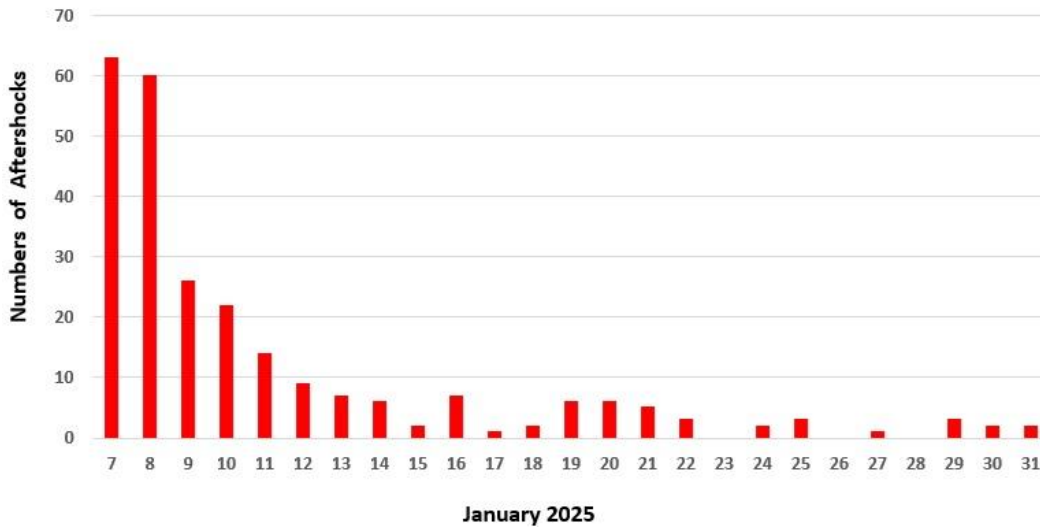


Figure 9: Temporal distribution of aftershocks of M: 7.1 Tibet earthquake of 7th January 2025.

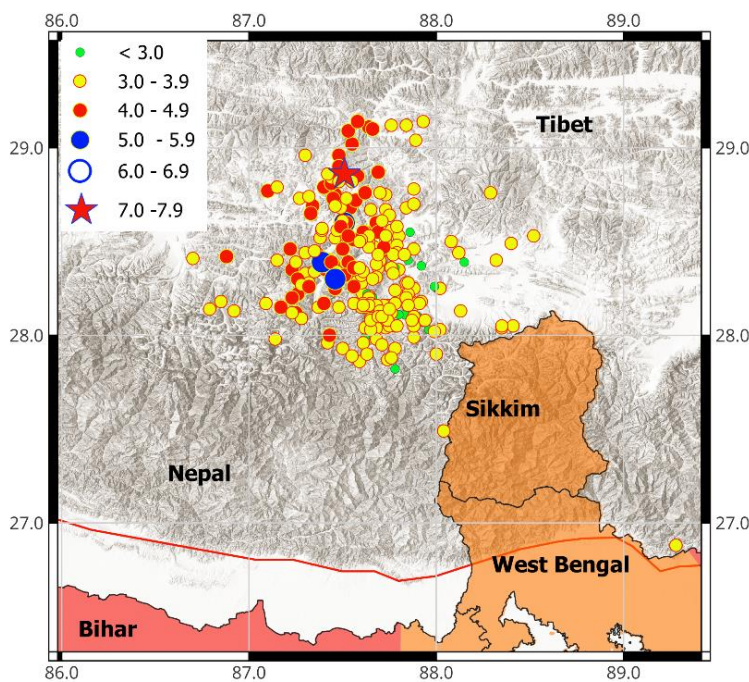
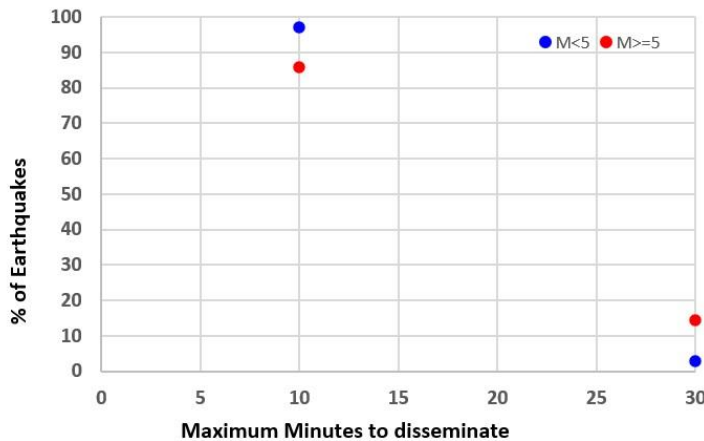


Figure 10: Spatial distribution of aftershocks of M: 7.1 Tibet earthquake of 7th January 2025.

4) Dissemination Performance:



More than **90%** earthquakes of **M<5.0** and about **90%** 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 as shown in **Figure 11**.

Figure 11: Dissemination of earthquakes within different time ranges during 01 –31 January 2025.