

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 December 2024

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 December 2024 a total number of 129 earthquakes have

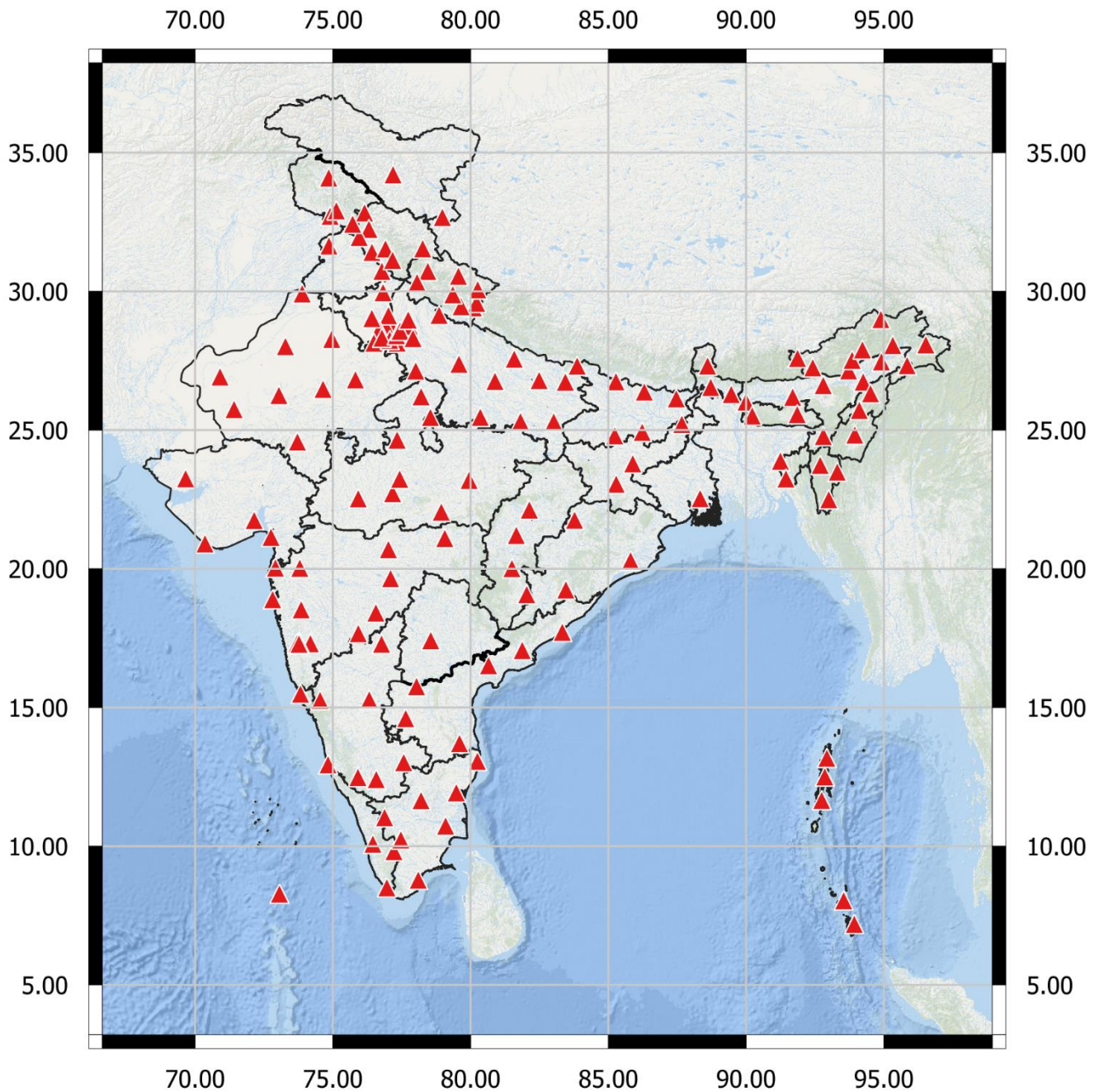


Figure 1: National Seismological Network (NSN) of 166 Stations

been located and disseminated from the center (**Figure:2**), out of which 121 earthquakes has occurred in India and its neighborhood region bounded by the coordinates 0° - 40°N & 60° -100°E (**Figure:3**).

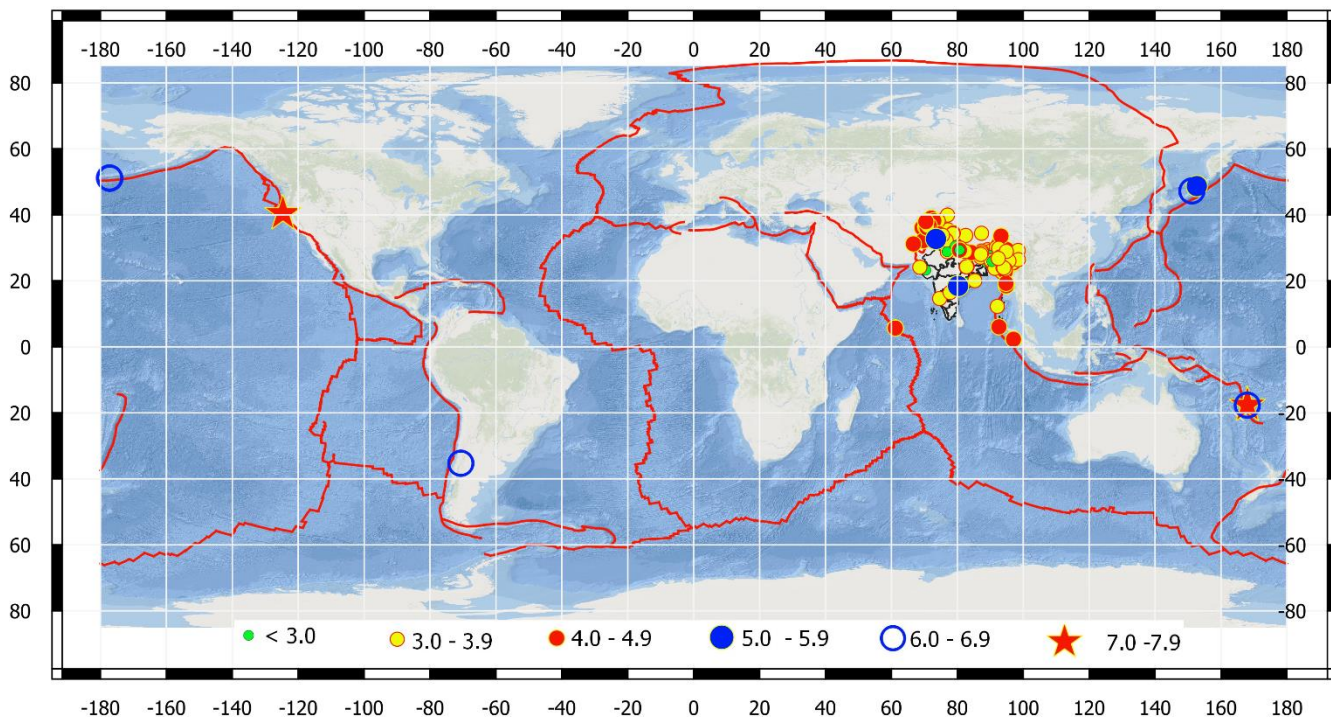


Figure 2: Earthquakes located and disseminated by NCS during 01st – 31st December 2024

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, Meghalaya, Manipur, Nagaland and Tripura) as shown in **Figure 3**.

Few earthquakes of smaller magnitudes were also reported in northern (Sonipat in Haryana), western (Kachchh in Gujrat); southern (Mulugu and Mahabubnagar in Telangana); central (Singrauli in Madhya Pradesh) and eastern (Sonbhadra in Uttar Pradesh; Kalahandi and Nayagarh in Odisha) part of country. **Seventeen** earthquakes of smaller magnitude (**M < 3.0**) comprising **13%** of all earthquakes occurred during 01st to 31st December 2024.

Two 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 December 2024 within India and its neighbourhood

SN	Date	Time (IST)	Lat($^{\circ}$ N)	Long($^{\circ}$ E)	D (KM)	M	Region
1	2024-12-04	07:27:02	18.44	80.24	40	5.3	Mulugu, Telangana
2	2024-12-05	11:51:25	32.69	73.54	109	5.0	Pakistan

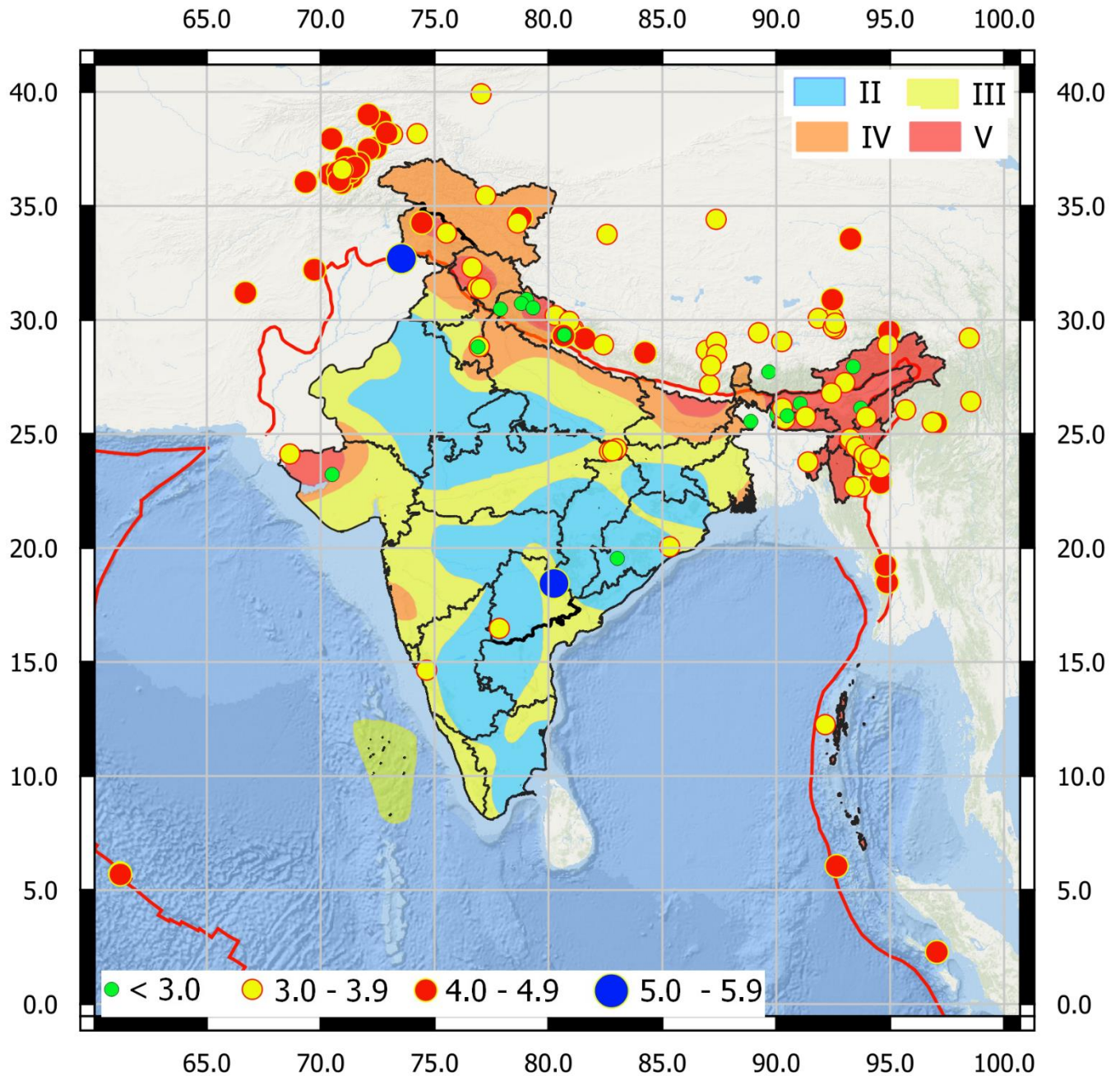


Figure 3: Map showing the seismicity during the period 01st – 31st December 2024 occurred in India and its neighbourhood region along with the seismic zone of India.

Out of total 129 earthquakes **50%** and **29%** earthquakes occurred in the magnitude range **3.0-3.9** and **4.0-4.9** respectively; whereas **three** earthquakes in the magnitude range 5.0-5.9 occurred

during the period of which two were inside the grid of 0- 40⁰N & 60-100⁰E as shown in **Figure 3**. All the **five** earthquakes in the magnitude range of **6.0-6.9** and **two** earthquakes in the magnitude range of **7.0-7.9** were occurred outside the grid of 0- 40⁰N & 60-100⁰E; as shown in **Figure 2** and **Figure 4(a)**. Detail list of earthquakes occurred during the month is available at www.seismo.gov.in

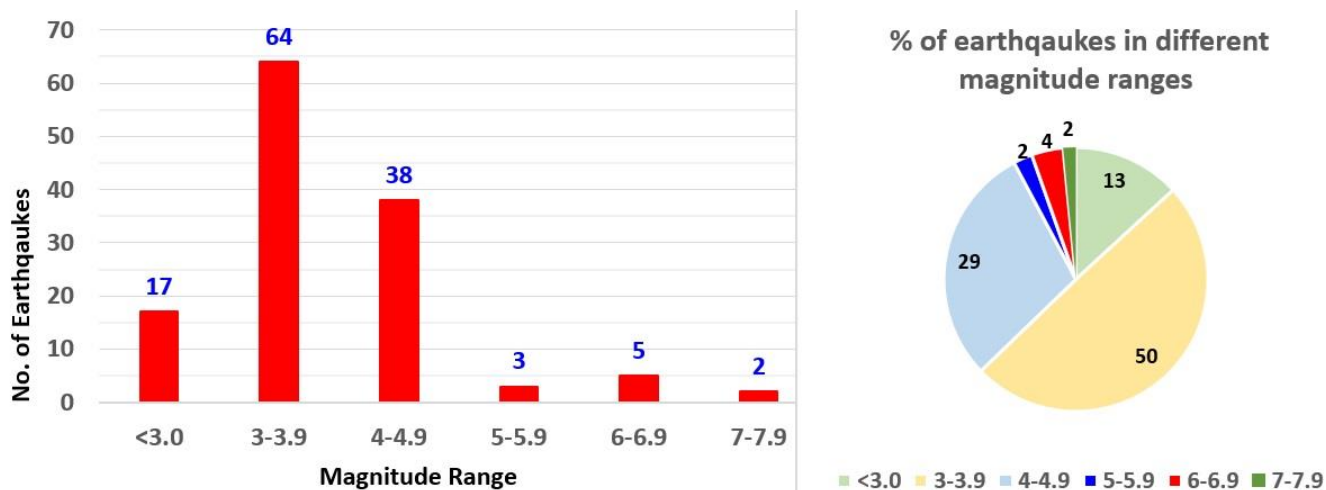


Figure 4 (a) : Distribution of earthquakes in the different magnitude range during 01st – 31st December 2024.

There is positive change in number of earthquakes with respect to previous month (November 2024) in the magnitude range of 7.0 – 7.9 only as shown in **Figure 4 (b)**.

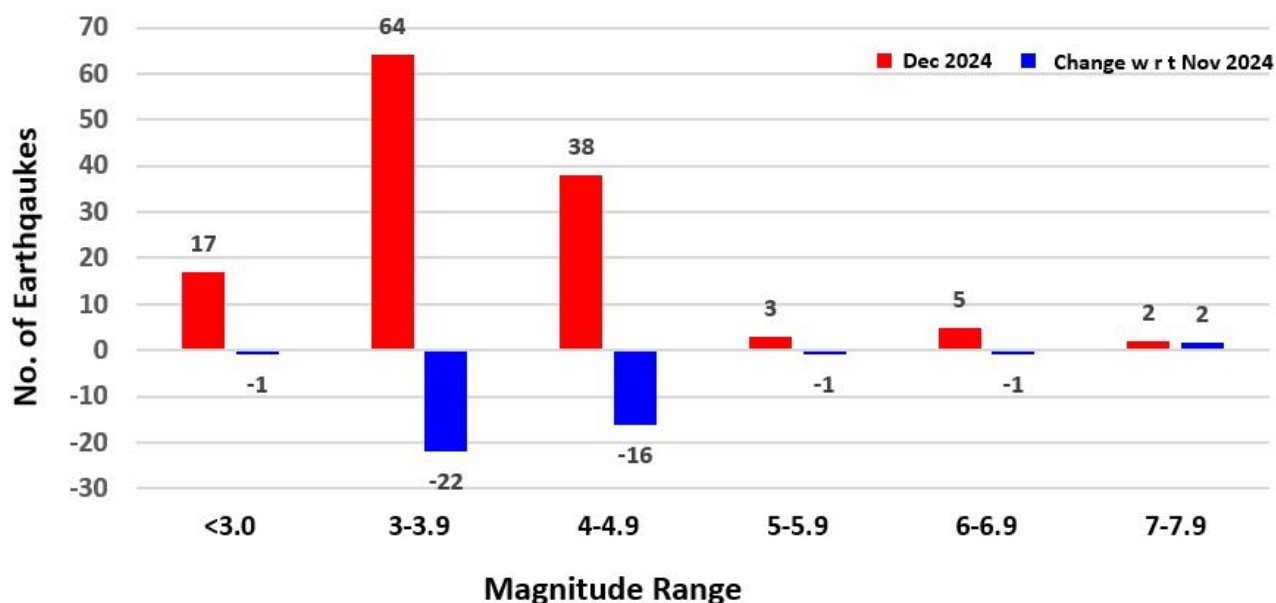


Figure 4 (b) : Change of occurrence of earthquakes in different magnitude ranges w r t previous month

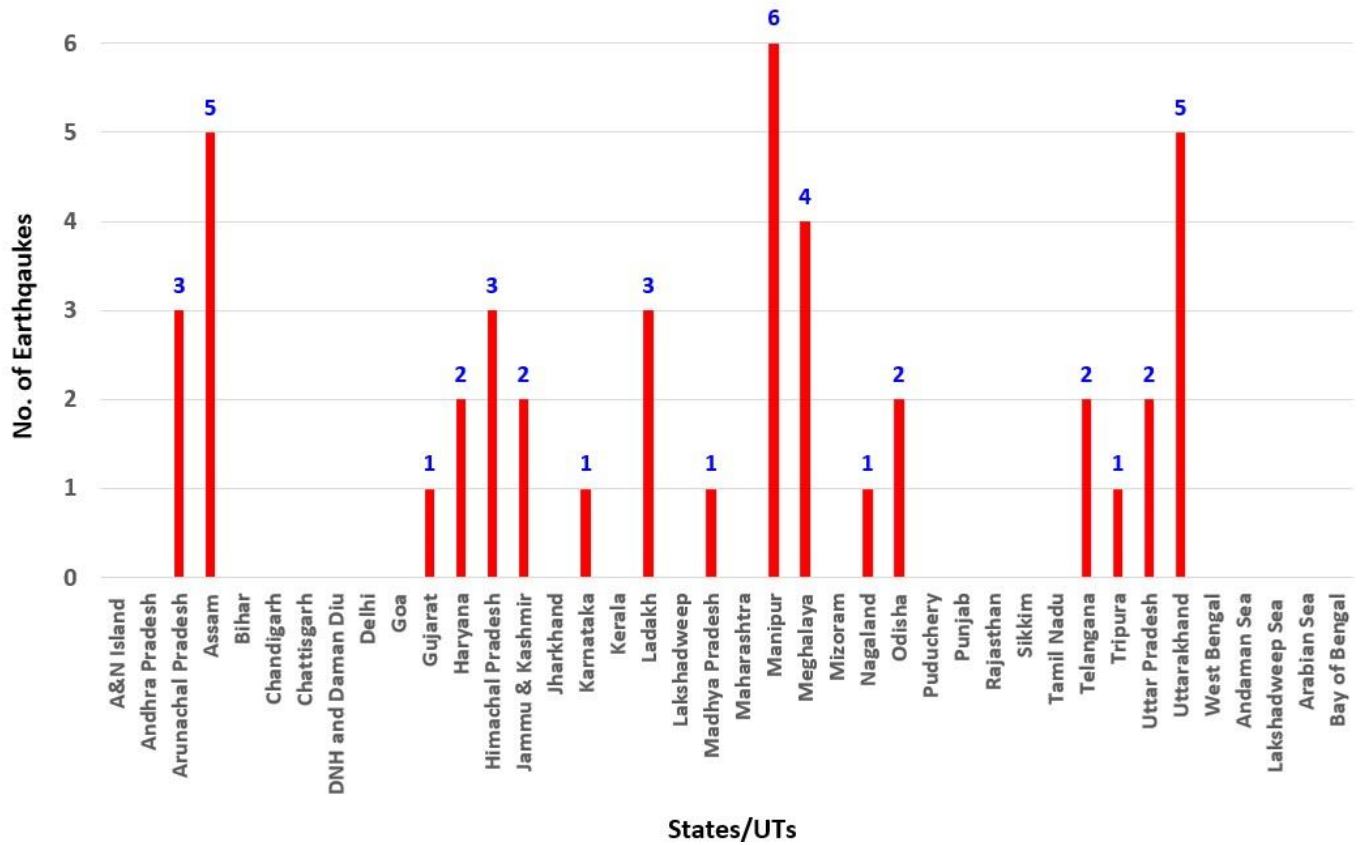


Figure 5: State wise distribution of earthquakes during the period 01st – 31st December 2024.

Total **44** earthquakes occurred within Indian territory; of which 6 earthquakes occurred in Manipur and 5 each in Assam and Uttarakhand during the period. Out of 44 earthquakes **17** and **20** earthquakes occurred in **North** and **North-East** region respectively. State/UT and region wise distribution of earthquakes occurred during 01st – 31st December 2024 is shown in **Figure 5** and **Figure 7** respectively. There was sparse activity in central and western and south part of the country during the 01st – 31st December 2024 (**Figure 3** and **Figure 6**).

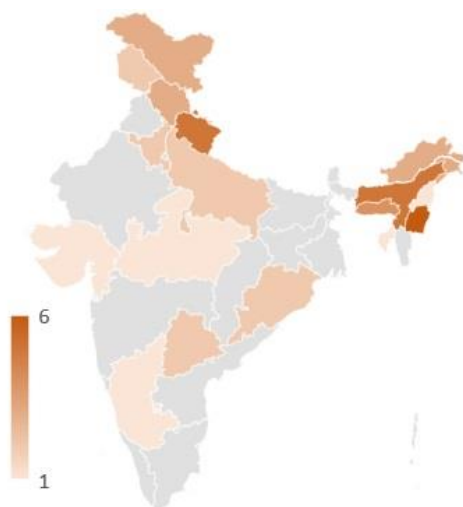


Figure: 6 Earthquake Density map

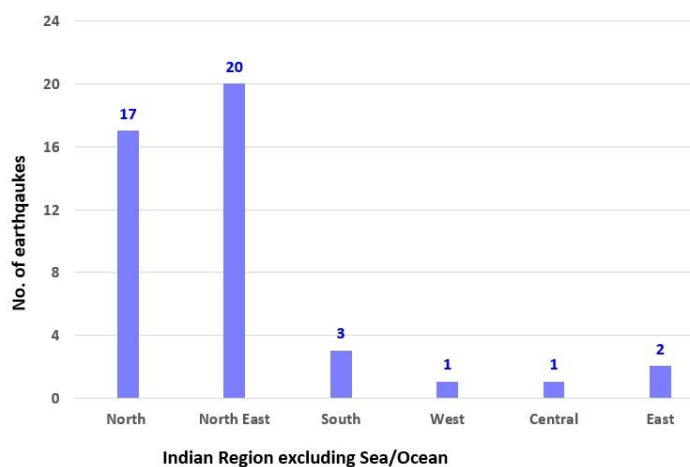


Figure: 7 Region wise distribution

3) Significant Activity:

Telangana Earthquakes: An earthquake of **M:5.3** occurred at **07:27:02 IST** of **04th December 2024** in Mulugu, Telangana at 18.44°N and 80.24°E with focal depth of 45 km. The epicentre is about 105 Km NW of Bhadrachalam; 127 Km E of Karim Nagar; 130 Km S of Khammam; 195 Km SW of Jagdalpur and 215 Km NE of Hyderabad. **Figure 8** depicts the expected intensity of this earthquake around the source zone. This earthquake was widely felt in Telangana, Andhra Pradesh, Chhattisgarh, Odisha and Maharashtra. More information about this earthquake is available at the following URL <https://riseq.seismo.gov.in/riseq/earthquake/event/c3MyOHLudzNXQm80dy80cjlOTGdPUT09/Reviewed> .

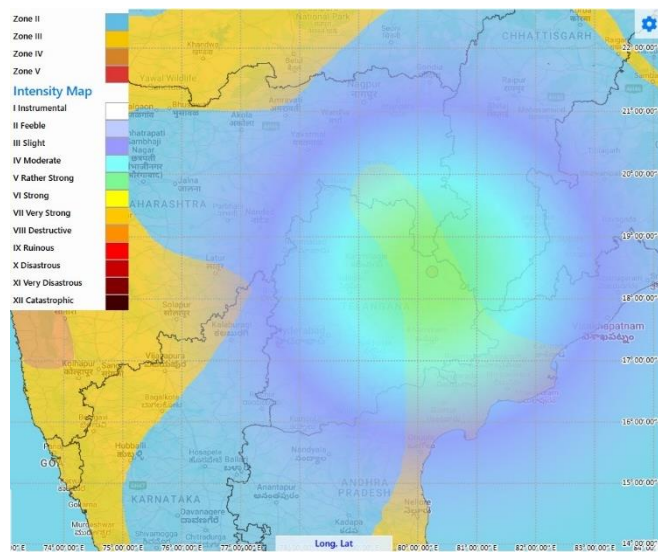
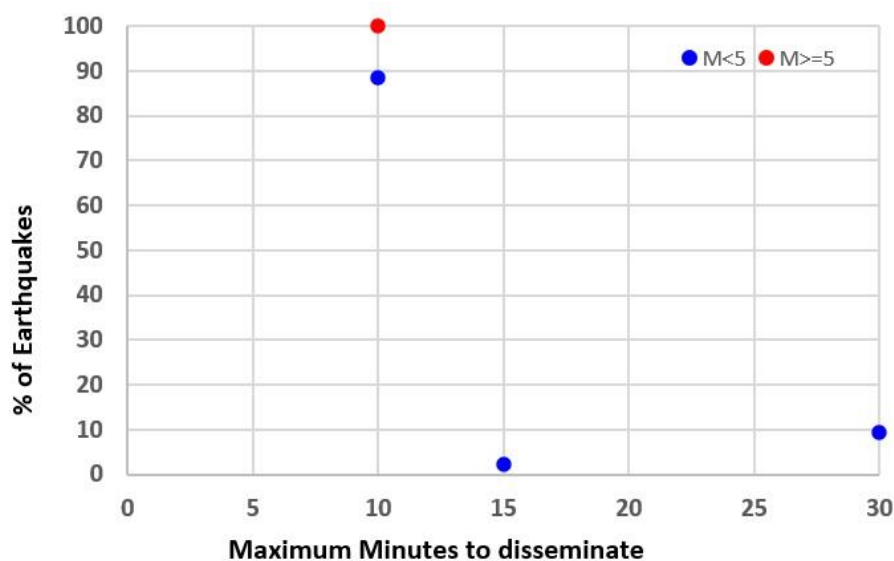


Figure 8: Intensity map of earthquake of M 5.3 occurred on 4th December 2024 at Mulugu, Telangana.

4) Dissemination Performance:



About **90%** earthquakes of **M<5.0** and **100%** 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 9**.

Figure 9: Dissemination of earthquakes within different time ranges during 01st –31st December 2024.