

# Report on Real Time Earthquake Location

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Month: April 2021  
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# Report of Earthquakes occurred in the month of April 2021

## 1) Introduction:

National Center for Seismology maintains National Seismological Network of 115 stations each having state of art equipment and spreading all across the country. Using these stations during the period 01<sup>st</sup> – 30<sup>th</sup> April 2021 a total number of 144 earthquakes have been located and disseminated from the center (**Figure:1**), out of which 136 earthquakes has occurred in India and its neighborhood region bounded by the coordinates 0°- 40°N & 60°-100°E (**Figure:2**).

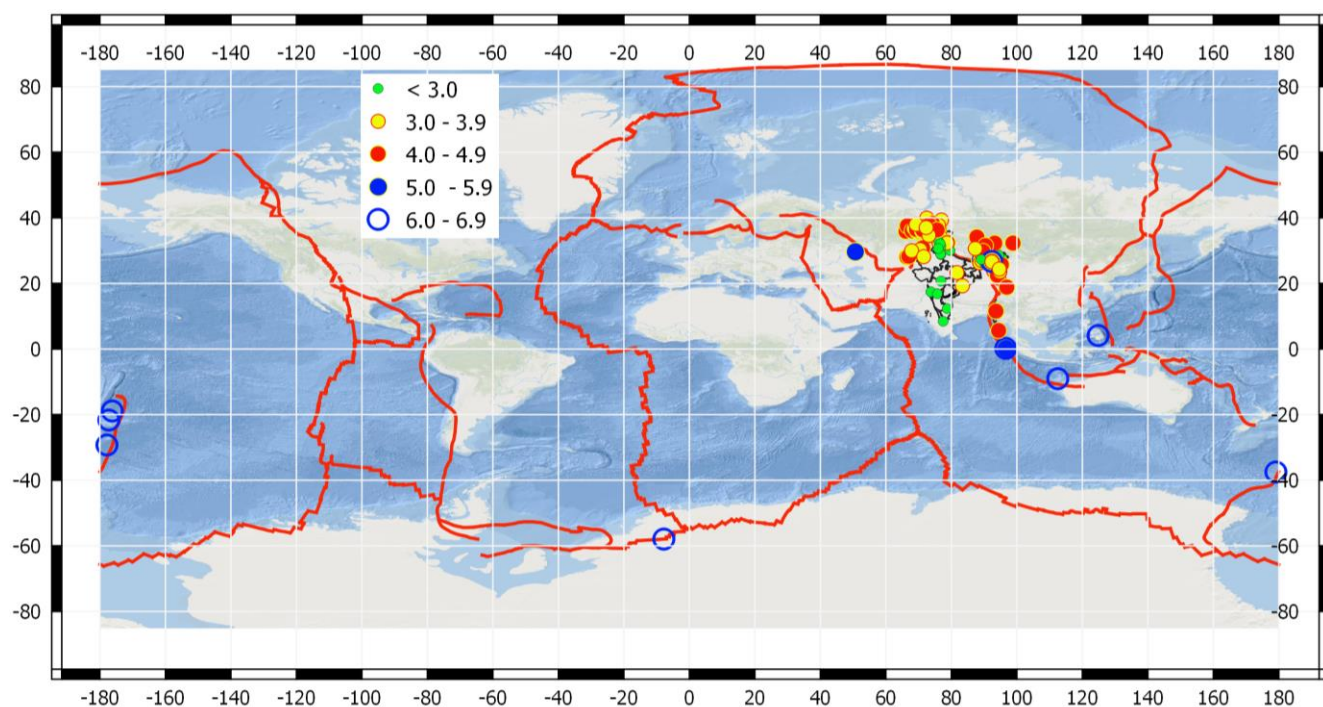


Figure 1: Earthquakes located and disseminated by NCS during 01<sup>st</sup> –30<sup>th</sup> April 2021

## 2) Seismicity:

During the period, the density of earthquakes in India and its neighborhood region bounded by the coordinates 0- 40°N & 60-100°E; can largely be seen in Hindu Kush region, North Western and North Eastern part of India as shown in **Figure:2**. Four earthquakes of magnitude M:5.0 and above occurred during the month in the region as detailed in following table.

SN	Date	Time (IST)	Lat(°N)	Long(°E)	Depth (KM)	M	Region
1	2021-04-05	20:49:58	27.23	88.84	10	5.1	Bhutan - India (Sikkim) Border
2	2021-04-10	15:00:43	4.12	124.84	300	6	Northern Sumatra
3	2021-04-14	16:25:18	0.12	96.68	30	5.3	Northern Sumatra
4	2021-04-28	07:51:25	26.69	92.36	17	6.4	Sonitpur, Assam

Few earthquakes of smaller magnitudes were also reported in southern, central and western part of country.

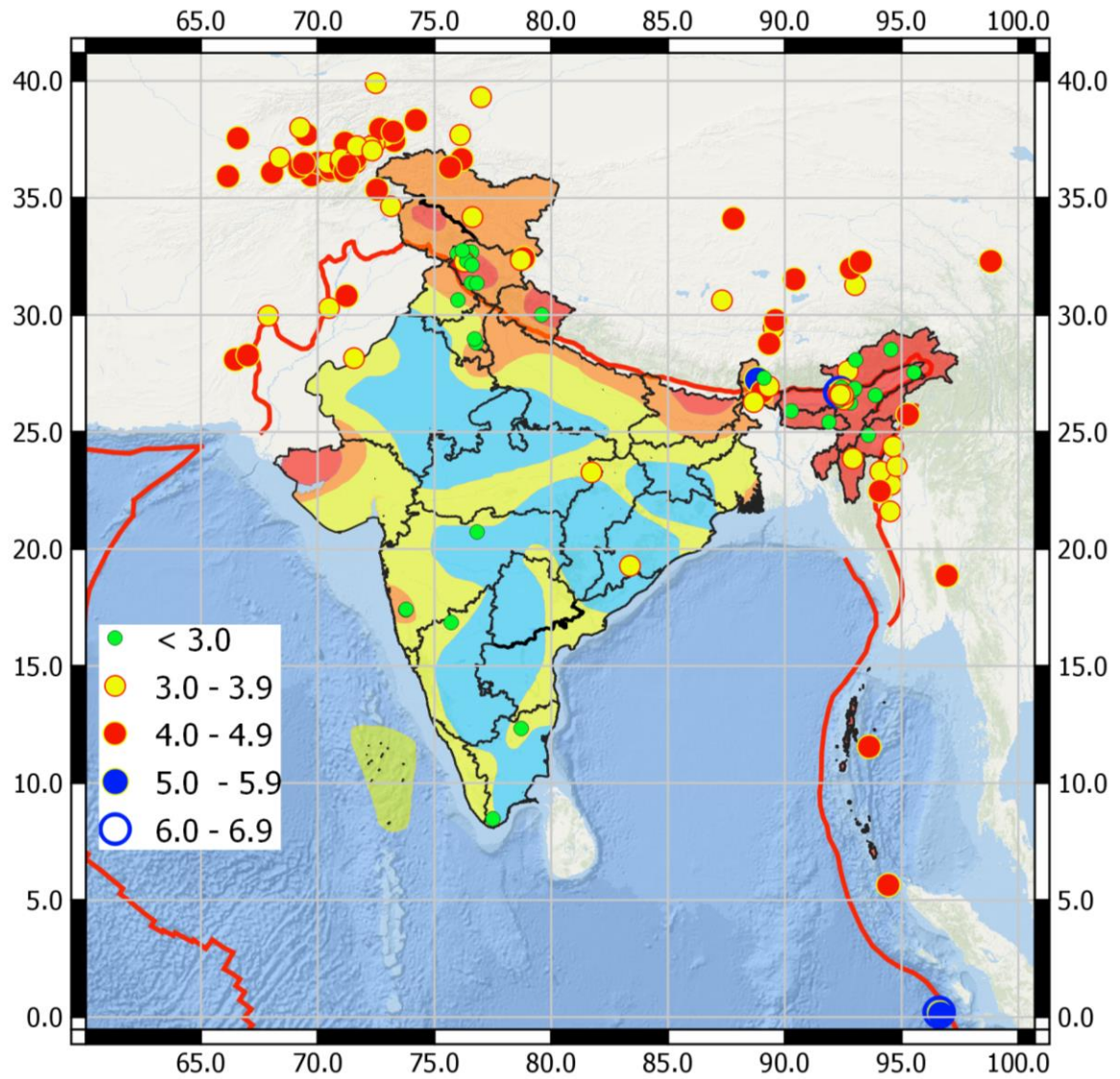


Figure 2: Map showing the seismicity during the period 01<sup>st</sup> –30<sup>th</sup> April 2021 occurred in India and its neighbourhood region along with the seismic zone of India.

Out of total 144 earthquakes, around **36%** and **31%** of events occurred in the magnitude range **3.0-3.9** and **4.0 -4.9** respectively, whereas only two and nine earthquakes occurred in the magnitude range, **5.0-5.9** and **6.0-6.9** respectively as shown in **Figure:3**. Detail list of earthquakes occurred during the month is available [www.seismo.gov.in](http://www.seismo.gov.in)

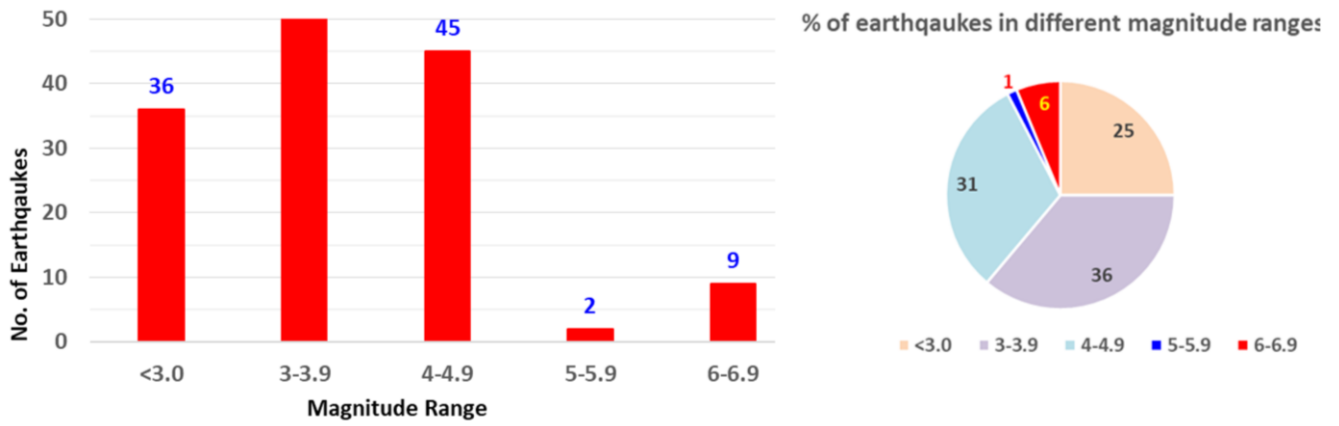


Figure 3: Pie-Chart and Bar-Diagram showing the number of earthquakes occurred in the magnitude range during the period 01<sup>st</sup> –30<sup>th</sup> April 2021 that was disseminated.

### 3) Significant Earthquakes:

#### A. Bhutan-India (Sikkim) Border Earthquake:

An earthquake of **M:5.1** occurred on **5<sup>th</sup> April 2021** at **20:49:58 IST** in the Bhutan - India (Sikkim) Border region with epicentre at 27.23 N and 88.84 E at 10 km depth. Earthquake occurred close to Himalayan Frontal Thrust. The epicenter is 25km ESE from Gangtok,

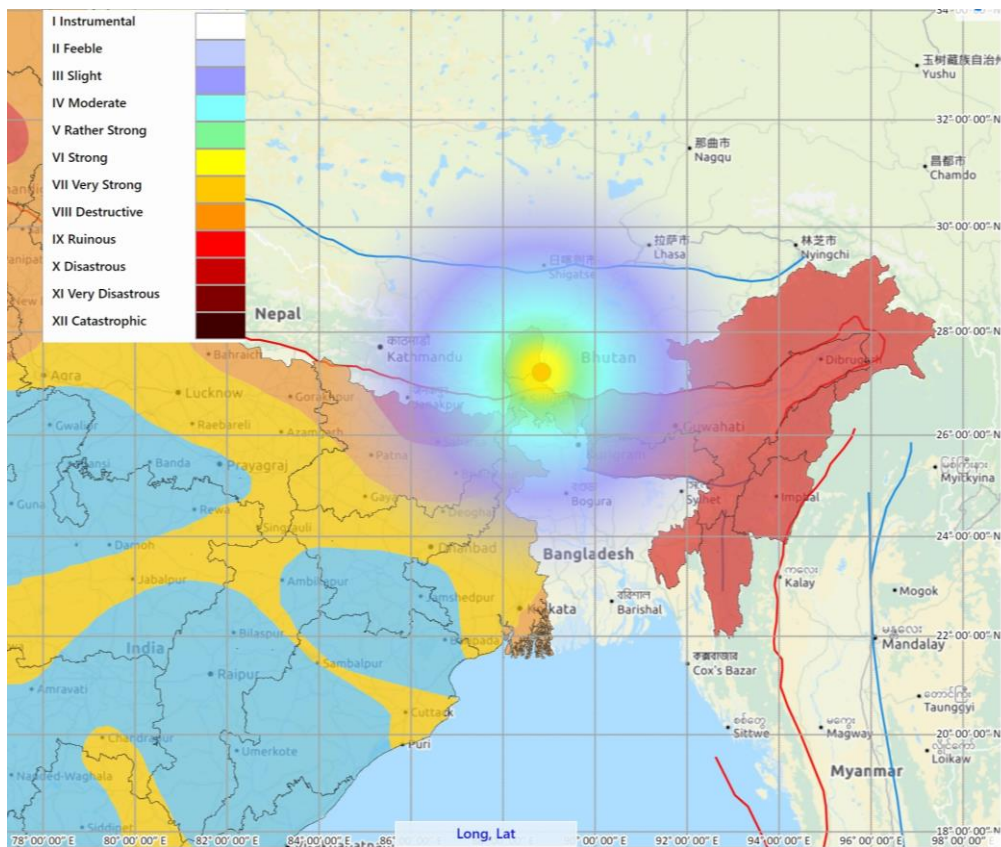


Figure 4: Map showing the epicentre (circle) and intensity of Bhutan-India (Sikkim) Border earthquake of of the M:5.1, on 2021-04-05 at 20:49:58(IST) overlaid on Zonation (zone IV) map of India.

Sikkim and 70km NNE from Siliguri, west Bengal. The epicentre is about 3.5 Km away from Eastern border of Sikkim in Bhutan S (Figure: 4). This earthquake was widely felt in the Sikkim, Bihar, Nepal and adjoining areas. (Figure :5)

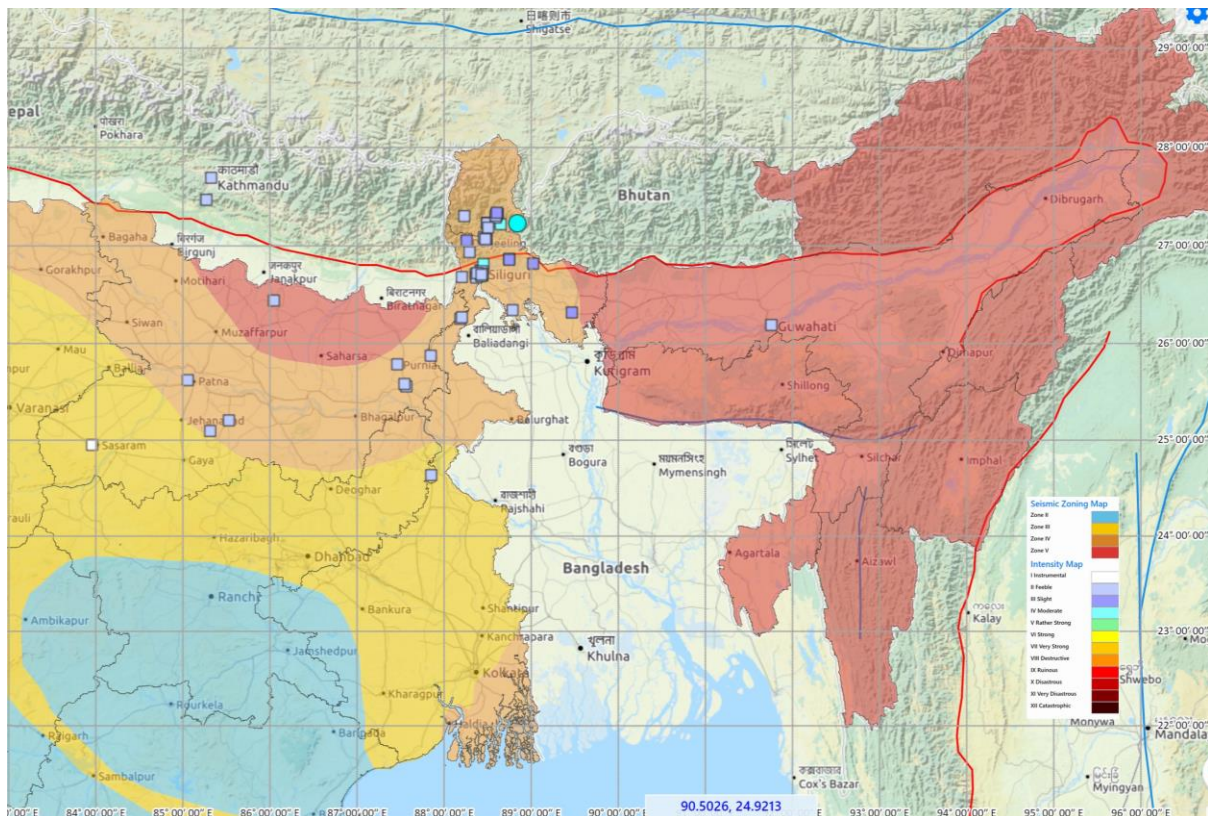


Figure 5: Map showing the epicentre (Blue Circle) and felt responses (more than 50) received from different parts of the country for the M:5.1, on 2021-04-05 at 20:49:58(IST) in Bhutan-Sikkim, India Border; overlaid on Zonation (zone IV) map of India

## B. Assam Earthquake

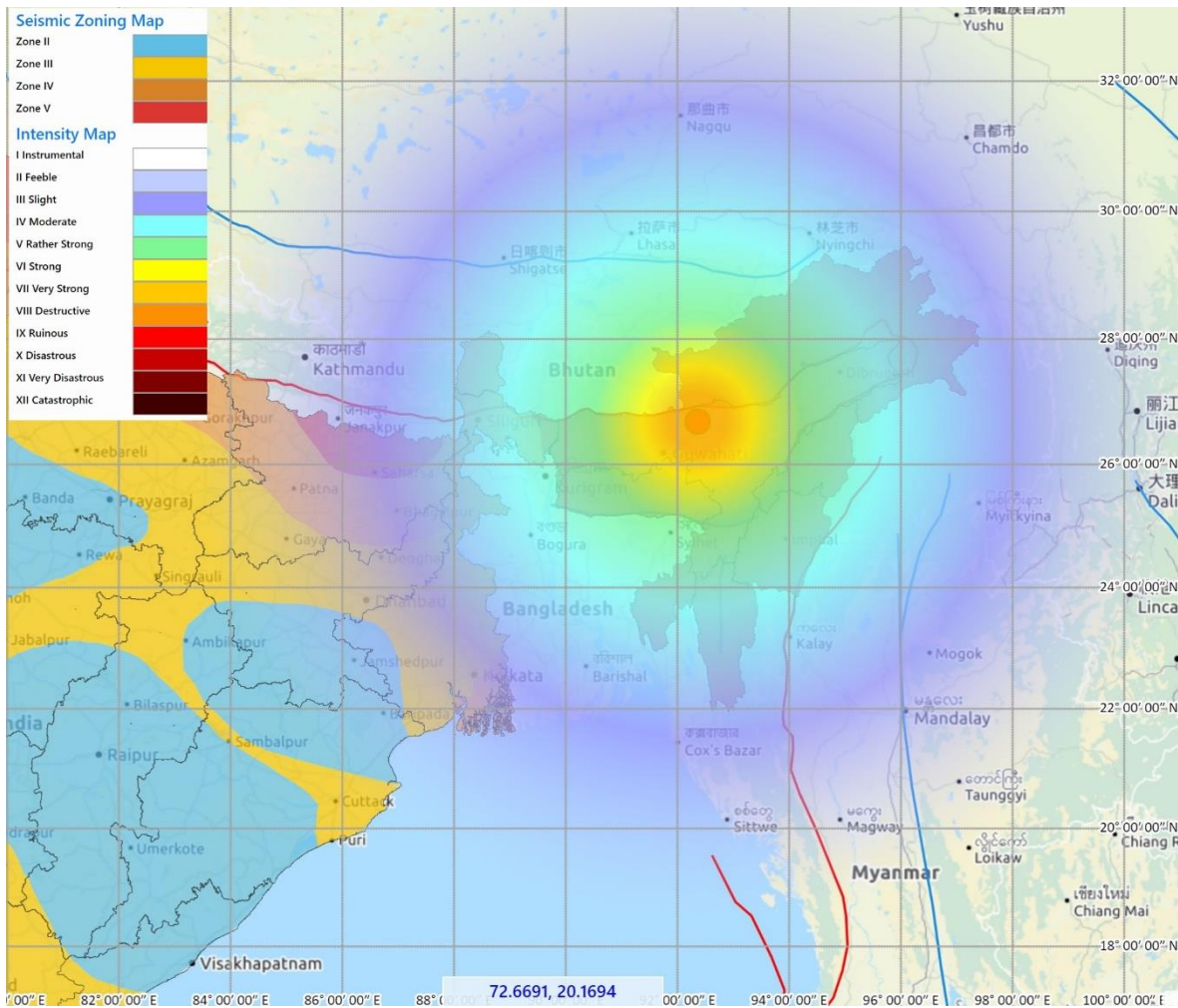
An earthquake of Magnitude **M:6.4** occurred on **28<sup>th</sup> April 2021** at **07:51:25 IST** in **Sonitpur, Assam** with epicentre at  $26.69^{\circ}$  N and  $92.36^{\circ}$  E, focal depth of 17 Km. The epicentre is closer to the plate boundary and located at about 80 Km NE of Guwahati; 132 Km N of Shillong and 180 Km W of Jorhat. The preliminary analysis shows that the events are located near to Kopili Fault closer to Himalayan Frontal Thrust (HFT). The area is seismically very active falling in the highest Seismic Hazard zone V associated with collisional tectonics where Indian plate subducts beneath the Eurasian Plate. This earthquake is well recorded by national seismological network at more than 80 observatories.

Expected intensity of this earthquake is assimilated by NCS, MoES as shown in **Figure 6**. The earthquake is felt in entire North East region of India and some parts of Bihar, West Bengal and Bangladesh. More than 200 felt reports due to this earthquake, have been received from Assam,

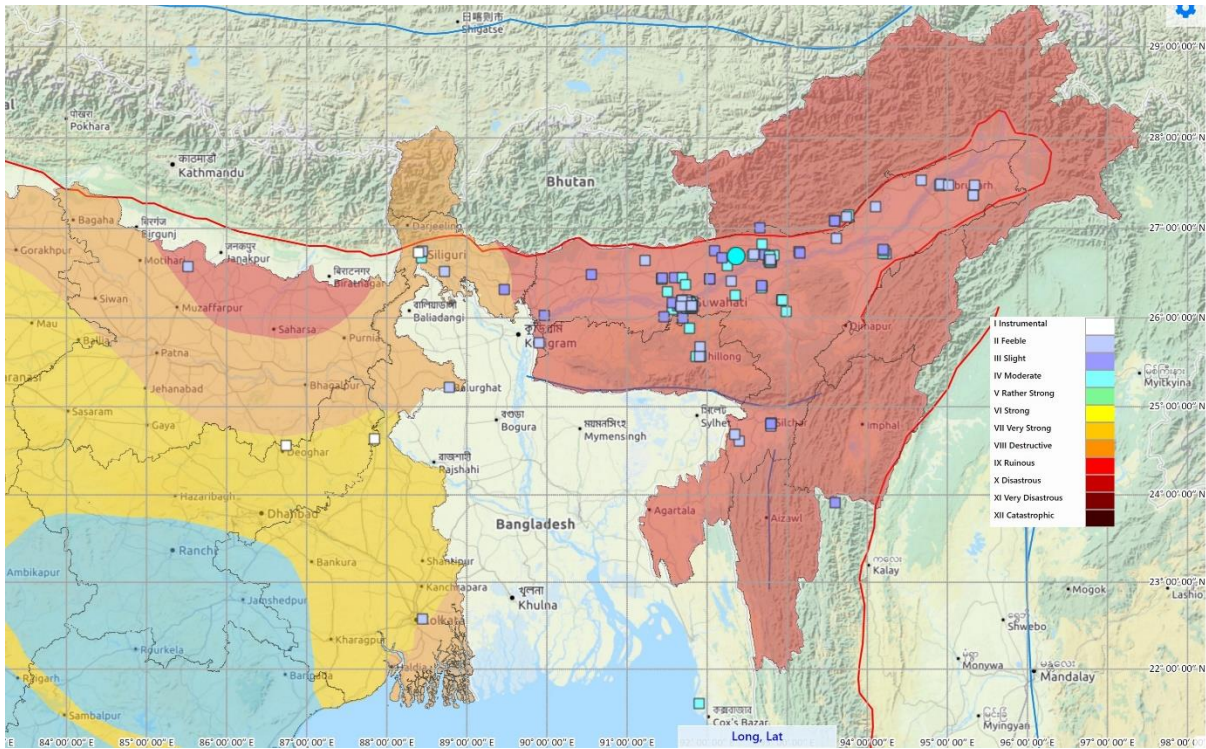
Bihar, Meghalaya, West Bengal and Bangladesh through NCS website and Mobile App having intensity ranging from I to V on Modified Mercalli Intensity (MMI) Scale (**Figure 7**).

Damages to buildings also reported within 100 km from epicentre in areas of Sonitpur, Nagaon, Guwahati as received from Central Seismological Observatory, NCS, Shillong and Regional Meteorological Centre, IMD, Guwahati.

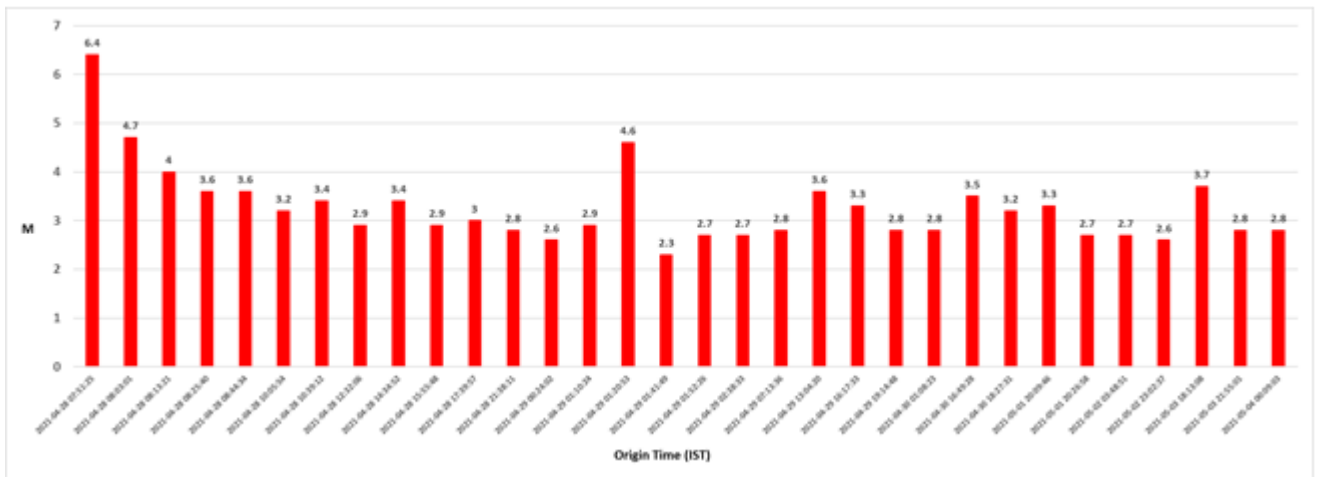
A total of **33-number of aftershocks** of magnitude range of M: 2.3 to M:4.7 are located **till 00:09 IST of 4<sup>th</sup> May 20201**, signifying the release of the stress in the vicinity of source zone in and around Sonitpur, Assam (**Figure 8 a and 8 b**). Epicentral distribution of aftershocks is shown in **Figure 9**.



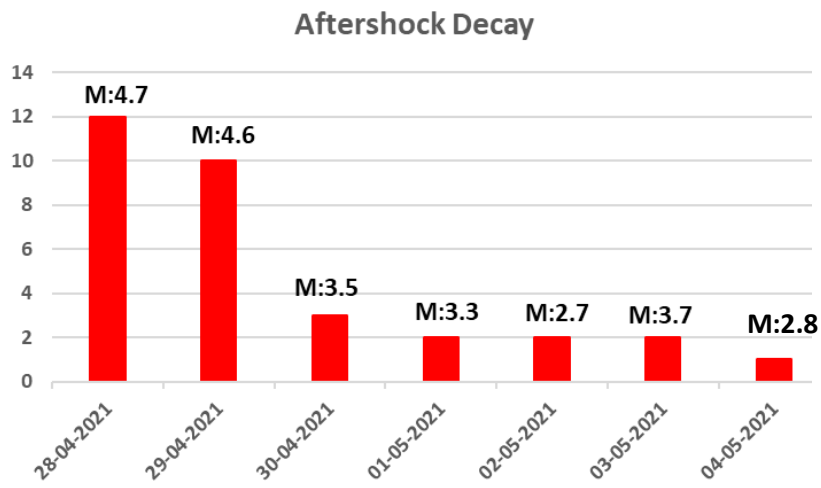
**Figure 6:** Estimated earthquake Intensity Map of the Mainshock M:6.4 of 28<sup>th</sup> April 2021



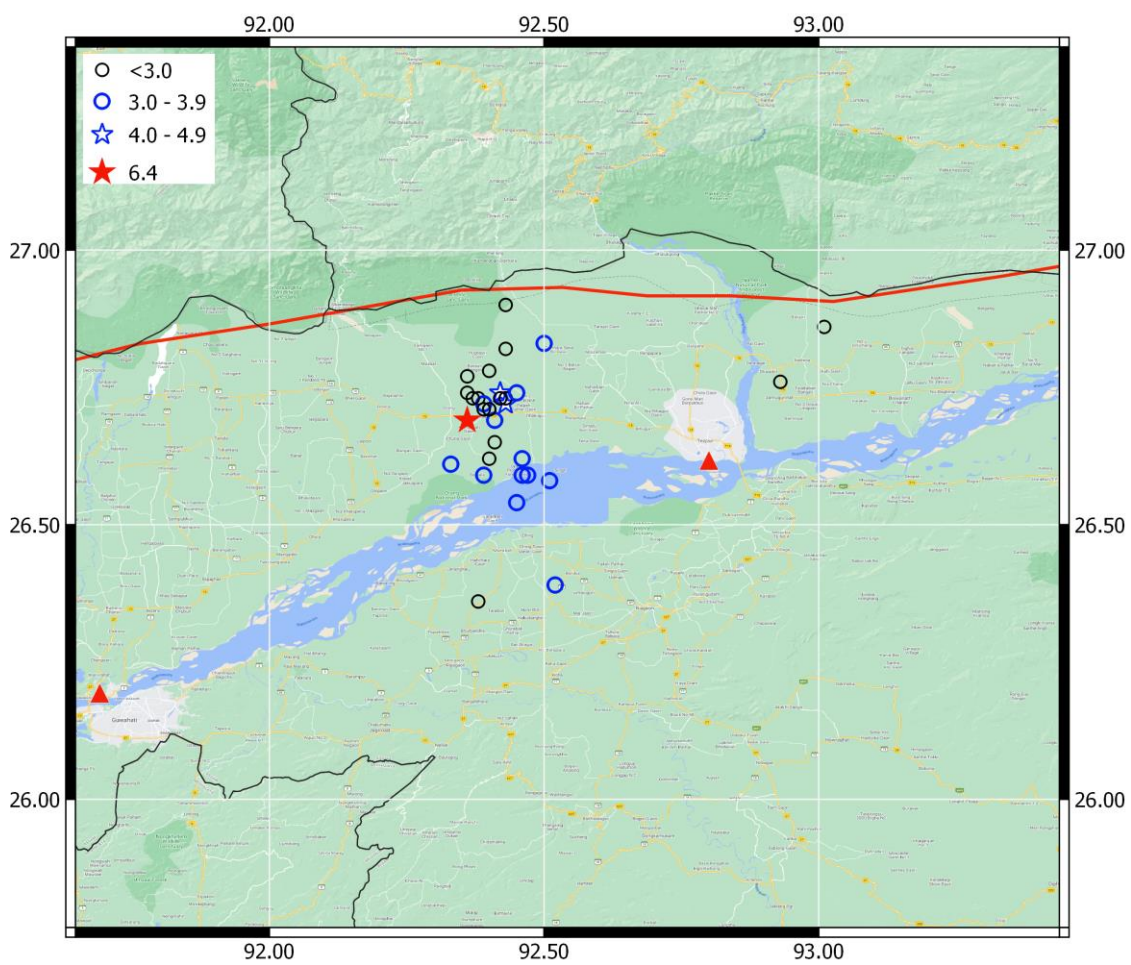
**Figure 7:** Felt responses (squares) of the 28<sup>th</sup> April 2021 earthquake M:6.4 (circle) from different users reported on [www.seismo.gov.in](http://www.seismo.gov.in) and BhooKamp app.



**Figure 8(a)** Temporal distribution of mainshock and its aftershocks



**Figure 8(b):** Daily decay pattern of no. of aftershock with maximum magnitude



**Figure 9:** Spatial distribution of aftershocks of 28<sup>th</sup> April 2021 earthquake(M:6.4) of varying magnitudes