



**Preliminary Report on the 2nd December 2023,
Bangladesh Earthquake (M 5.6)**

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An earthquake of magnitude M 5.6 occurred at 09:05:31 IST on 2nd December 2023, with its epicenter located at 23.15°N and 90.89°E at a depth of 55 km. The epicenter is in Bangladesh and lies 187 Km SW of Dharmanagar, Tripura, and 197 Km WSW of Aizawl, Mizoram. The event was well recorded by seismic stations under National Seismological Network of National Centre for Seismology. The past seismicity of the region including the epicenter of the present earthquake is shown in **Figure 1**.

The expected intensity of this earthquake is assimilated by NCS, MoES as shown in **Figure 2** which is ranging from III to VI. The earthquake is widely felt in Meghalaya and neighbouring states. Six felt reports due to this earthquake, have been received from West Bengal and Tripura through NCS website and Mobile App within one hour assigning intensity III on Modified Mercalli Intensity (MMI) Scale as shown in **Figure 3 & 4**.

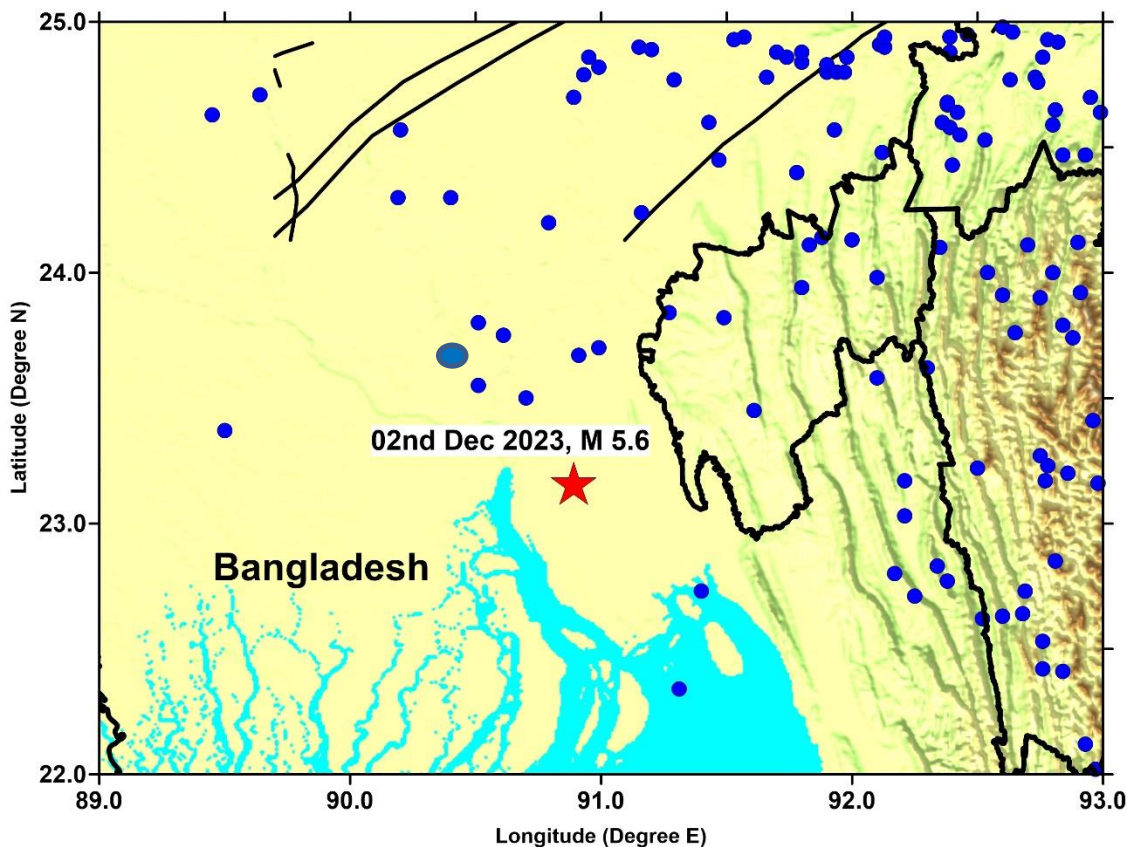


Figure 1: The present earthquake (M 5.6) of 02nd December 2023 is shown in red color star and seismicity in the epicentral and surrounding regions for the past 10 years (2013-2023) (source: www.seismo.gov.in; NCS-MoES). The geological faults and lineament data were sourced from Bhukosh, GSI.

The eastern regions of Bangladesh, along with the surrounding areas, are situated within an actively seismic zone, closely linked to the subduction of the Indian plate. The morphotectonic features present in northern Bangladesh highlight a significant correlation with the movement of the

Dauki fault system and the concurrent uplift of the Shillong plateau. Seismic activity within the eastern folded belt reflects a larger pattern aligned with the Arakan-Yoma anticlinorium, showcasing shallow and low-angle thrust movements in line with on-site observations. In the deeper basin segments of Bangladesh, the seismotectonic behaviour suggests intraplate movement within the basement rock along deep-seated faults. The initial fault plane solution, obtained from moment tensor inversion, indicates a thrust fault mechanism. The occurrence of earthquakes in the region primarily aligns with the Dauki Fault and Kaladan fault, in addition to several local faults and geological demarcated lineaments.

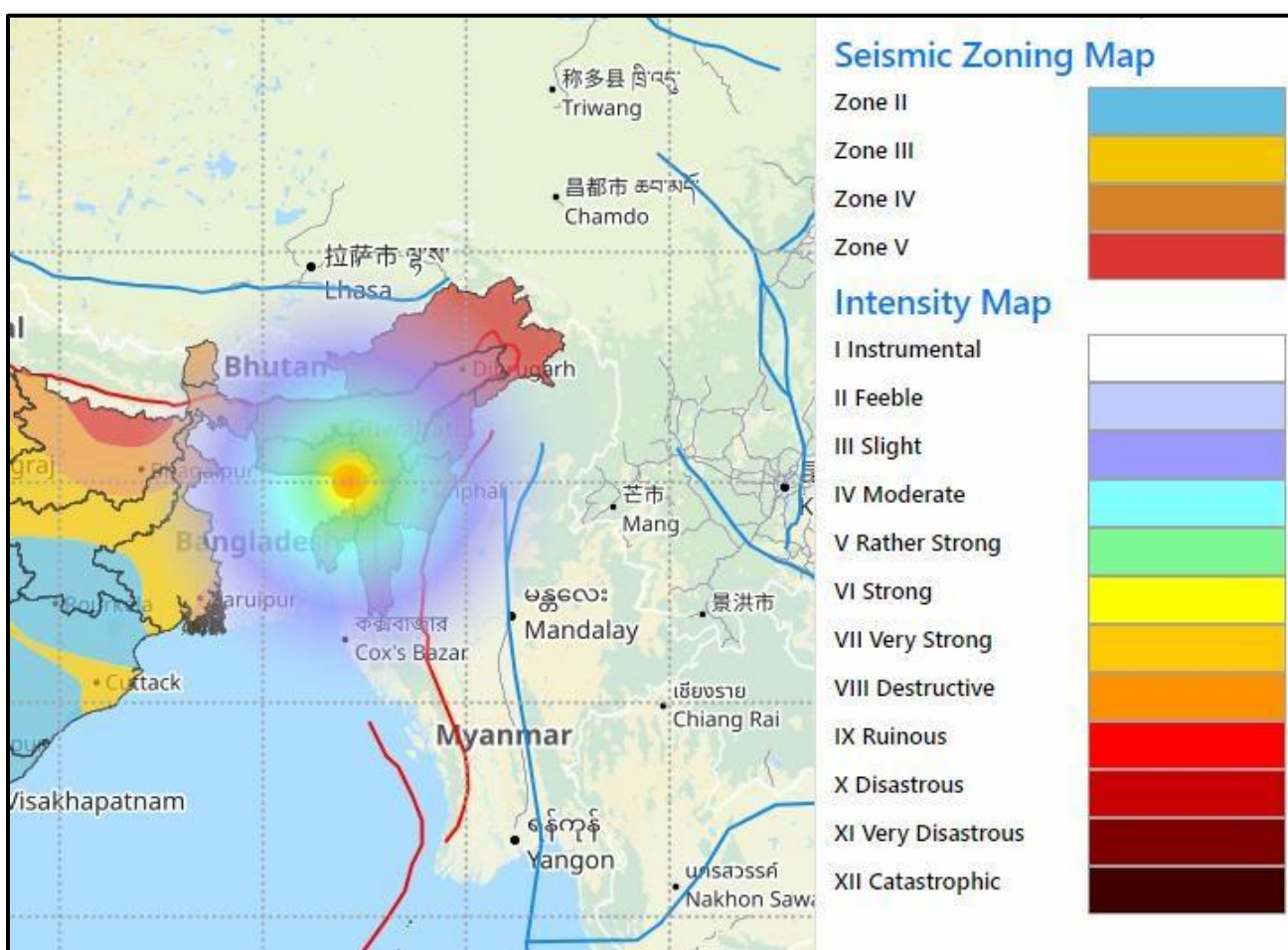


Figure 2: Intensity Map of the 2nd December 2023 earthquake (M:5.6)

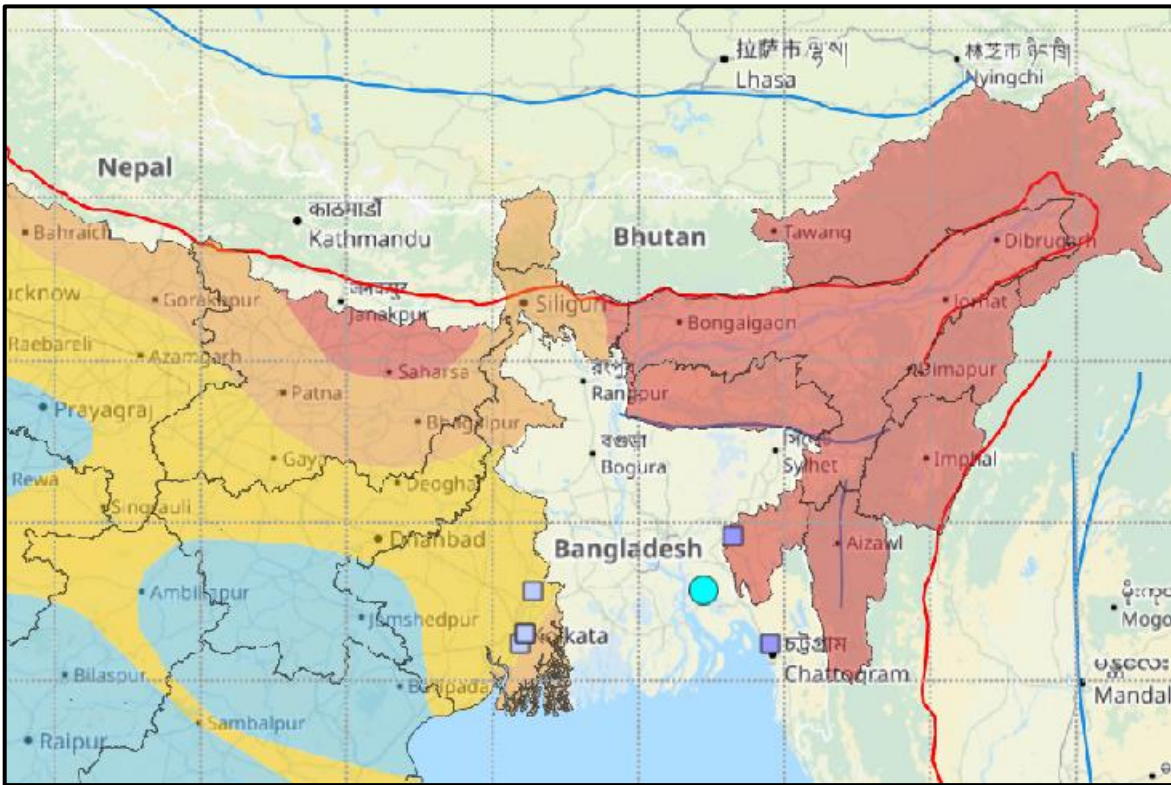


Figure 3: Felt responses (purple squares) were reported through the website (www.seismo.gov.in) and the BhooKamp mobile-app. Within one hour of the earthquake's occurrence four responses were received.

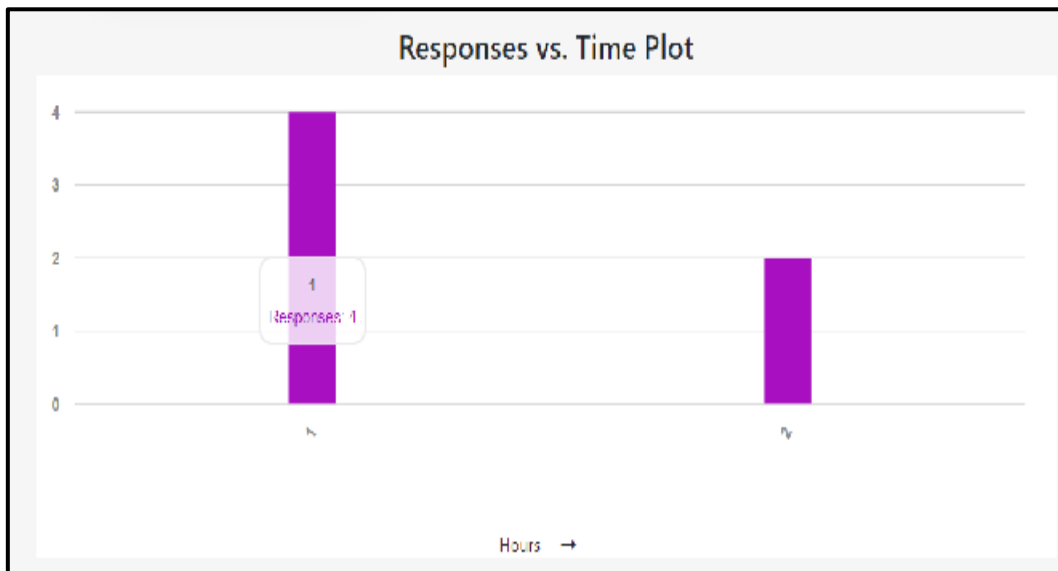


Figure 4: Number of felt responses with respect to time lapses.