

Seismic Environments in Northeast India Region: An Appraisal

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Seismic environments of northeast India region is reviewed. The region is bounded by the Himalayan collision zone to the north and Indo-Burma subduction zone to the east, and the largest Bengal delta lies to its south. Different tectonic/seismic zones in the region are examined using the teleseismic and the recent local microearthquake network data. The earthquakes in the eastern Himalayan collision zone are deeper (>30 km) compared to that (<30 km) in the western Himalayan seismic zone. The deeper earthquakes in the eastern Himalaya are mostly caused by transverse tectonics including the 1950 great earthquake (M_s 8.7) that occurred in the eastern Himalayan syntaxis zone. The earthquakes in the Indo-Burma region, on the other hand, are caused by the atypical continent-continent subduction; the shallower (< 90 km) events show normal and strike-slip faulting, and the deeper earthquakes, depth 90 to ~ 200 km, are generated by thrust faulting within the dipping seismic zone. The intra plate earthquakes in the Shillong plateau including the 1897 great earthquake is explained by the pop-up tectonics of the plateau, and the intense activity along the Kopili fault in the Assam valley by transverse tectonics that extend to the Bhutan Himalaya. The recent 2009 Bhutan Himalaya earthquake M_w 6.3 is explained by transverse tectonics of the ~ 400 km long Kopili fault. The lower seismic activity in the Bengal basin is attributed to thicker sediments and locking of the Indian plate below the basin.