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Earthquake activity of offshore Sri Lanka after recent major Sumatra earthquakes

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The study of earthquakes has provided a better understanding of the plate tectonics and the internal structure of the Earth. Subduction zones are generally characterized by well defined inclined seismic zones extending, in some cases, down to about 500-670 km deep beneath the Earth. The Sumatra subduction zone is characterized by the Indo-Australia Plate subducting beneath the Sunda plate and Andaman micro plate about 55 mm/yr, causing seismic activity along the plate boundary. Therefore, a large number of earthquakes take place in the region. There had been five major earthquakes of magnitude greater than 8.0 in this region from 2004 to 2014. Three of them are dip-slip and the other two are strike-slip type events. Regional earthquake activity after the occurrence of these five events was analyzed.

Hypocentral data of magnitude 3.0 obtained from the Data Management Center at the Incorporated Research Institutions for Seismology for the period from January 2000 to December 2014 were used in the analysis. Spatial distribution of focal mechanisms was analyzed for major events to investigate the geometry of faulting during earthquake fault slip using the data available from the Global Centroid Moment Tensor solution database for the above period. A statistical analysis was carried out to determine if earthquake activity had increased after the five major events. For this purpose, the analysis was carried out both qualitatively and quantitatively.

The results of the analysis show that the number of earthquakes in the region has increased considerably after the occurrence of the April 2012, magnitude 8.6 and 8.2 strike-slip events. Further, the results show that there was no change in regional earthquake activity after the occurrence of the other three major dip-slip type events. The strike-slip type focal mechanism of the 2012 two major events may be the reason for the increase in regional activity. The results of the present study reasonably agree with the results obtained by the other studies carried out in the same region using different methods.

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