

Quantification of Future Earthquake Hazard and Risk in Hindukush-Pamir Himalaya Using IMS Network Data

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Seismic threat and related earthquake engineering dedications usually require evaluation of return periods or probabilities of exceedance of specific levels of design load criteria or extremal safety conditions. For the purpose, a comprehensive treatment of earthquake hazard estimation, Gumbel's type-I extremes event probability distribution have been used to estimate designed earthquake recurrence times using annual extreme magnitudes. Hindukush-Pamir Himalaya and their vicinity bounded by 25–40°N and 65–85°E have been selected for quantify future earthquake hazard and risk. The result of analyses have enabled earthquake hazard that exist in the Hindukush-Pamir Himalayan belt to be quantified in terms of recurrence periods and probabilities of occurrence of earthquake of any given magnitude. Seventeen years complete and reliable earthquake data from June 13, 1999 to March 12, 2015 have been taken from International Monitoring System (IMS) Network setup by Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Vienna Austria. Study indicates that the most probable largest annual earthquakes are close to 5.5. The most probable earthquakes that may occur in an interval of 50 years are estimated as 6.6. The results are potentially useful for probabilistic seismic hazard assessment in the region.

Primary author: SHANKER, Daya (Indian Institute of Technology Roorkee)

Presenter: SHANKER, Daya (Indian Institute of Technology Roorkee)

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