

Newly Formulated Attenuation Relationship and Seismic Hazard Assessment for Muzaffarabad, Pakistan

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The region/site-specific attenuation equation has been established for the site of Muzaffarabad, using the global data bank of accelerograms and local strong-motion data (already existing data and the data generated in the present study). A comprehensive database has been compiled using the global data bank (i.e. strong motion records from on-line data banks of European Strong-motion Data, and the COSMOS Virtual Data Center); and the local data bank (i.e. the strong motion data of WAPDA, Nilore and PMD). We removed uncertainties involved in this attenuation equation for Muzaffarabad.

Peak ground accelerations using a catalogue containing instrumentally recorded events of magnitude 4 and greater have been calculated. Seismic source regions are modelled to establish relationships between earthquake magnitude and earthquake frequency. Seismic hazard curves have been generated based on probable Peak Ground Acceleration (PGA) for 10% probability of exceedance for time-spans of 50 years (return period of 475 years) using the EZ FRISK software. The newly formulated attenuation equation has been used for the purpose. Twelve faults have been selected as the critical seismogenic features and their maximum potential magnitudes determined using four regression relations. The MBT with a maximum potential magnitude of 8.1 and PGA value of 0.25g is designated as the most critical tectonic feature for the site of Muzaffarabad.