

Seismic Hazard Evaluation for the Diamer Basha Dam Site, NW Himalayan Fold and Thrust Belt, Pakistan

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The NW Himalayan Fold-and-Thrust Belt, Pakistan is considered to be seismically one of the most active zone of the world. The Diamer Basha Dam (DBD) local seismic network was put in operation in August 2007. It is situated in the eastern part of NW Himalayan Fold and Thrust Belt, in order to record local seismicity and to give information about the micro as well as the macroseismic earthquake activity in the area. It is also providing crucial close distance data for precisely locating stronger earthquakes in the region that are otherwise recorded also by regional and global seismic networks. The network consists of ten short period three component digital seismic stations.

Seismic Hazard Assessment (SHA) for the site of DBD has been carried out by using the DBD local seismic network data along with the global data. SHA has been carried out using the usual convention of Probabilistic Seismic Hazard Assessment (PSHA) and Deterministic Seismic Hazard Assessment (DSHA). The seismotectonic model comprising of three seismic source zones with the estimation of maximum possible magnitudes m_{\max} of 7.8 (Zone 1), 7.4 (Zone 2) and 7.8 (Zone 3) respectively, has been established. The deterministic seismic hazard assessment (DSHA), using 6 attenuation equations, has been carried out for Peak Ground Acceleration (PGA) for DBD. The Main Mantle Thrust (MMT) yielded the highest median PGA value. The Probabilistic Seismic Hazard Assessment (PSHA) was also performed, which was necessary in order to obtain the Operating Basis Earthquake (OBE) and the Maximum Design Earthquake (MDE) as defined in ICOLD (1989) guidelines. A PGA of 0.33g with a 10% probability of exceedance in 50 years have been assigned for DBD using PSHA.

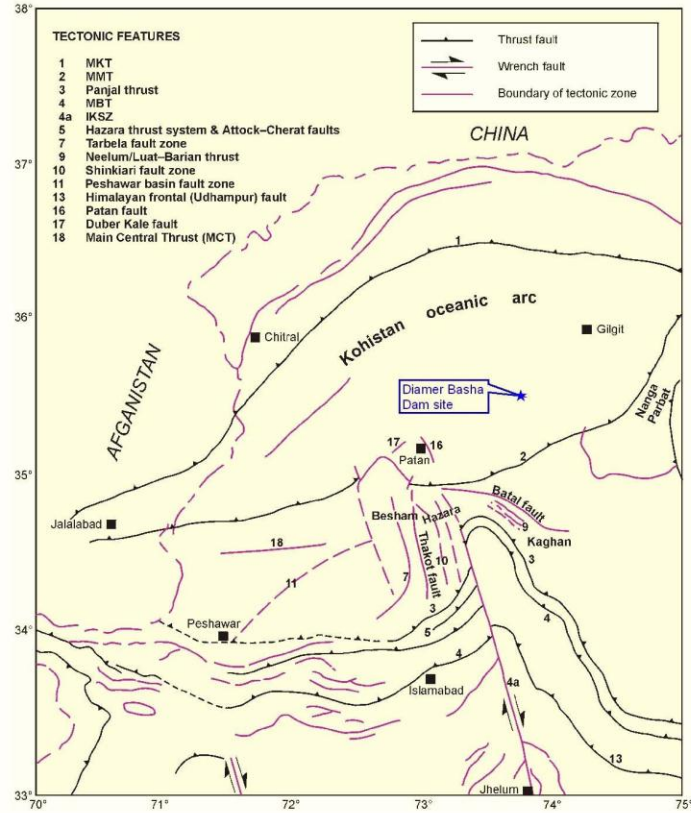


Fig. 1. Location map of Damer Basha Dam (DBD) site along with the major tectonic features within the area (modified after Kazmi and Rana, (1982).