



Seismic Risk Assessment for the Kyrgyz Republic

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The Kyrgyz Republic is one of the most socially and economically dynamic countries in Central Asia, and one of the most endangered by earthquake hazard in the region. In order to support the government of the Kyrgyz Republic in the development of a country-level Disaster Risk Reduction strategy, a comprehensive seismic risk study has been developed with the support of the World Bank. As part of this project, state-of-the-art hazard, exposure and vulnerability models have been developed and combined into the assessment of direct physical and economic risk on residential, educational and transportation infrastructure. The seismic hazard has been modelled with three different approaches, in order to provide a comprehensive overview of the possible consequences. A probabilistic seismic hazard assessment (PSHA) approach has been used to quantitatively evaluate the distribution of expected ground shaking intensity, as constrained by the compiled earthquake catalogue and associated seismic source model. A set of specific seismic scenarios based on events generated from known fault systems have been also considered, in order to provide insight on the expected consequences in case of strong events in proximity of densely inhabited areas. Furthermore, long-span catalogues of events have been generated stochastically and employed in the probabilistic analysis of expected losses over the territory of the Kyrgyz Republic. Damage and risk estimates have been computed by using an exposure model recently developed for the country, combined with the assignment of suitable fragility/vulnerability models. The risk estimation has been carried out with spatial aggregation at the district (rayon) level. The obtained results confirm the high level of seismic risk throughout the country, also pinpointing the location of several risk hotspots, particularly in the southern districts, in correspondence with the Ferghana valley. The outcome of this project will further support the local decision makers in implementing specific prevention and mitigation measures that are consistent with a broad risk reduction strategy.