FROM INITIAL DESIGN TO PRESENT STANDARDS: SEISMIC SOURCES AND CATALOGUES FOR THE ENGURI DAM

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Abstract*. The Enguri High Dam, the highest arch dam in Europe and one of the tallest worldwide (271.5 m), was originally designed in the 20th century for a seismic input corresponding to PGA up to 0.56 g. However, recent probabilistic seismic hazard models developed within the GEM–EMME frameworks suggest higher ground motions, with PGA values approaching 0.9 g. This discrepancy raises critical questions regarding the robustness of the existing hazard assessments and the seismic safety of the dam.*

To address this issue, we initiated a comprehensive investigation combining local and regional seismic data. Spatial clustering of microseismicity allowed us to identify active faults. At the regional scale, we compiled a new unified Georgian earthquake catalogue by merging and harmonizing recently published datasets. For consistency, we also evaluated the completeness and derived Gutenberg–Richter parameters for three independent catalogues: new national catalogue, the EMME dataset, and the GEM-ISC compilation. The comparison highlights both commonalities and discrepancies in seismicity rates and recurrence characteristics, which are crucial for subsequent hazard modeling.While the current study focuses on catalogue development, source characterization, and preliminary seismotectonic insights, the next step will be a probabilistic seismic hazard assessment that integrates the refined catalogues and updated source models.

Key words: *Earthquake catalog, microseismisity, seismic hazard.*

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