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Seismic hazard and risk assessment for Baku, the capital city of Azerbaijan

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A rapid growth of population, intensive civil and industrial building, land and water instabilities (e.g., landslides, significant underground water level fluctuations), and the lack of public awareness regarding seismic hazard contribute to the increase of vulnerability of the Baku city to earthquakes. In this study, we use a quantitative approach to estimate an earthquake risk in the city. The earthquake risk has been determined as a convolution of seismic hazard in terms of peak ground acceleration, vulnerability due to ground and construction conditions, population features, the gross domestic product per capita, and exposure of infrastructure and critical facilities. Seismic hazard and earthquake risk for Baku are assessed for three earthquake scenarios (near, far, and local events). The developed maps of earthquake loss provide useful information to identify the factors influencing the earthquake loss. Our results allow elaborating strategic countermeasure plans for the seismic risk mitigation in the Baku city.