Analysis of earthquake rate changes in eastern Azerbaijan

Gulam Babayev

Azerbaijan (babayev74@gmail.com)

Azerbaijan territory is situated in the active continent collision of the Arabian-Eurasian plates and involved in dynamics of lithospheric structural units of those plates. Seismicity is the severest stress-induced geohazard in the Azerbaijan. There are a number of active seismogenic zones existing in the country and eastern part of Azerbaijan is one of them. Absheron peninsula is one of the domains of the eastern Azerbaijan.This study presents the analysis of earthquake hazard for the Absheron peninsulaseismic zone (Azerbaijan) in terms of assessment of earthquake rate of the peninsula. Absheron peninsula is located on the north-western part of the South Caspian region and mostly represented by compression with the thrust and reverse faults. Although it experiences earthquakes of very low intensity from its own focal zones (with the magnitude ranges of Ms3.5-5.2), however the peninsula expects potential seismic hazard from the active focal zones of the Caspian Sea (the last strongest one was South Caspian earthquake with Ms6.3 occurred on the 25th of November in 2000) and Shamakhi-Ismailli (which is the other earthquake-prone territory in Azerbaijan; the last strongest one occurred in 1902 with Mw7.2at Shamakhi city). Baku city, the capital of Azerbaijan, is situated on the Absheron peninsula. Recent urban development and infrastructure improvement, land and water instabilities (e.g., landslides) and the lack of public awareness regarding seismic hazard indicates that in case of seismic disaster, the level of expected losses and damages is expected to be significant.With increasingvulnerabilityofthelifelinesystem and energy network of the peninsula, the seismic hazard estimation issue for the peninsula turns into the actual format.The aim of the study is to assess seismic rate processes based on the cumulative analysis (statistical-mathematical formulations) of the occurred earthquake within the period of 1935-2016.In this study, we researched the application techniques for probabilistic seismic hazard assessment (PSHA) for the eastern Azerbaijan. The graphs describing the reoccurrence and "representativeness" of the earthquakes were developed. The obtained results with the application of new methods (statistical-mathematical) will contribute to a deeper knowledge of the time dynamics of the seismicity and to a better assessment of the seismic hazard.