Time-dependent Seismic Hazard Assessment for Yangon, Myanmar: Impact of Stress Perturbation by Recent Earthquakes

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Two recent earthquakes have raised awareness of seismic hazard in Yangon, one of the largest metropolitans in Myanmar. The 2017 Taikkyi earthquake with M5.1 took place 50 km away from Yangon; the 2018 Bago Yoma earthquake with M6.0 took place 35 km west of the Sagaing fault. To precisely assess probabilistic seismic hazard for Yangon, we incorporated Coulomb stress change imparted by the two events and evaluated rate perturbation of each seismogenic source based on the rate-and-state friction model. After the Taikkyi earthquake, stress state in its vicinity has been promoted, suggesting occurrence of triggered aftershocks in the following months. Note that due to the small magnitude of this event, the impact on seismicity activity should be local and temporal. After occurrence of the Bago Yoma earthquake, the stress state along the Pyu segment of the Sagaing Fault has been elevated, which could promote next rupture in the future. Due to triggering effect, the seismic hazard levels in Yangon elevated right after the occurrence of the two events. We also proposed detailed hazard assessment for some specific sites considering site conditions based on V_s^{30} (the average shear-velocity down to 30 m depth), which is evaluated by microtremor measurements. The hazard curves that represent corresponding probability of exceeding ground shaking show higher hazards for sites with a low V_s^{30}, e.g., the Dagon Ward. This is the first seismic hazard model that provides time-dependent earthquake probability constraints for Yangon. It thus offers decision-makers and public officials an adequate basis for rapid evaluations of and response to future emergency scenarios such as victim relocation and sheltering.

Keywords: Coulomb stress change, Probabilistic seismic hazard assessment, Yangon

