Geophysical Research Abstracts
Vol. 15, EGU2013-3096, 2013
EGU General Assembly 2013

Seismic Risk Assessment and Loss Estimation for Tbilisi City

Nino Tsereteli (1), Victor Alania (1), Otar Varazanashvili (1), Tengiz Gugeshashvili (2), Vakhtang Arabidze (3), Nika Arevadze (4), Emili Tsereteli (5), Giorgi Gaphrindashvili (5), Alexander Gventcadze (1), Nino Goguadze (1), and Sophio Vephkhvadze (1)

(1) Institute of Geophysics of Tbilisi State University, Tbilisi, Georgia (nino66_ts@yahoo.com, 995 32 332867), (2) Ministry of Education and Science, Educational and Scientific Infrastructure Development Agency, (3) Agricultural University of Georgia, (4) Information Engineering Center (NGO), (5) Institute of Geography of Tbilisi State University, Tbilisi, Georgi

The proper assessment of seismic risk is of crucial importance for society protection and city sustainable economic development, as it is the essential part to seismic hazard reduction. Estimation of seismic risk and losses is complicated tasks. There is always knowledge deficiency on real seismic hazard, local site effects, inventory on elements at risk, infrastructure vulnerability, especially for developing countries. Lately great efforts was done in the frame of EMME (earthquake Model for Middle East Region) project, where in the work packages WP1, WP2 , WP3 and WP4 where improved gaps related to seismic hazard assessment and vulnerability analysis. Finely in the frame of work package wp5 “City Scenario” additional work to this direction and detail investigation of local site conditions, active fault (3D) beneath Tbilisi were done. For estimation economic losses the algorithm was prepared taking into account obtained inventory. The long term usage of building is very complex. It relates to the reliability and durability of buildings. The long term usage and durability of a building is determined by the concept of depreciation. Depreciation of an entire building is calculated by summing the products of individual construction unit’ depreciation rates and the corresponding value of these units within the building. This method of calculation is based on an assumption that depreciation is proportional to the building’s (constructions) useful life. We used this methodology to create a matrix, which provides a way to evaluate the depreciation rates of buildings with different type and construction period and to determine their corresponding value.
Finally loss was estimated resulting from shaking 10%, 5% and 2% exceedance probability in 50 years. Loss resulting from scenario earthquake (earthquake with possible maximum magnitude) also where estimated.