



Seismic Risk Assessment: The Historical Center of Bucharest / ROMANIA

I. Armaş, R. Damian, S. Dumitraşcu, M. Anghel

University of Bucharest, Bucharest, ROMANIA, iuliaarmas@yahoo.com

The paper stresses the need for a quantitative analysis of seismic risk and vulnerability of people and buildings at seismic hazard in the historical center of Bucharest. It also underlines the importance of human perception in effective risk reduction. Romanian capital is periodically subjected to the strong subcrustal seismicity originating in Vrancea region (about 70-170 km depth, 150 km epicentral distance), located at the Subcarpatian Bend area. The March 4, 1977, Vrancea earthquake ($M_W = 7.4$) represents the most destructive seismic event ever experienced in Bucharest. Next large earthquake, with a macroseismic intensity in the epicentrale zone: $I_{Buc} = VII$ or $VIII$ (MSK-64 scale), is predicted to strike in the window of probability 2006-2008, with a probability value of 67% (Enescu and Enescu, 1996).

A system is at risk if it is exposed and vulnerable to the potential phenomenon (Cardona, 2004, Birkmann, 2006).

The conceptual framework of this research views risk as the sum of hazard, exposure, vulnerability and capacity measures. The hazard is defined through its magnitude and probability, while vulnerability has a physical, social, economic and psychological dimension. The study is based on the compilation of the available morphological, geological, geotechnical data, on seismic records, the evaluation of the building stock vulnerability and analysis of the human dimension of disasters. Seismic risk evaluation aims to determine the expected degree of loss do to an earthquake hazard (specific risk) and the expected number of casualties and building damages (total risk), using a quantitative approach.

The specific risk is ascertained as the risk at which a set of elements (buildings, people) is subject when an earthquake strikes. The expected damage do to seismic hazard is ranked from low to high values based on the analysis of previous events.

Total seismic risk is the ensemble of all the specific risk levels. Very high total seismic risk is assigned in densely populated areas, where the seismic waves can cause house collapse, resulting in casualties and homeless people.