



## **From hazards to risks – comparative analysis of assessment techniques in the South Caucasus region**

**T. Chelidze (1)**, E. Tsereteli (2), N. Tsereteli (1), O. Varazanashvili (1), L. Kaldani (3), A. Karakhanyan (4), B. Panahi (5)

(1) M. Nodia Institute of Geophysics, Tbilisi, Georgia, (2) V. Bagrationi Institute of Geography, Tbilisi, Georgia, (3) Institute of Hydrology, Tbilisi, Georgia, (4) Institute of Geology, Yerevan, Armenia, (5) Institute of Geology, Baku, Azerbaijan (nino\_ts@ig.acnet.ge / Fax: +995 32-332867 / Phone: 995 32-335513)

Using the method developed by the Columbia University group during compilation of the Map of Global Natural Disaster Risk Hotspots (Synthesis Report - Natural Disaster Hotspots: A global Risk Analysis, 2005) Risk index related to total economic losses was estimated for South Caucasus. Three types of hazard (earthquake, landslide and snow avalanches) were considered for the period 1980 - 2006.

There are big discrepancies in hazard and risk assessments, in particular, for Caucasus region in different World Disaster Maps (for example, between Global Natural Disaster Hotspots Map and the Map of Global Seismic Hazard Assessment Program GSHAP and World Map of Natural Disasters of Munich Group). According to the Hotspot Map, the Southern Caucasus is prone only to hydrometeorological hazards when the northern Caucasus is subject to Geophysical and Hydro-hazards. Geophysical hazards include earthquakes, volcanoes and landslides. If it can be accepted that the hydro-hazards for the both regions are the same, the relative assessment of geophysical hazards, namely earthquakes and landslide risk for these two parts of Caucasus is wrong. The landslide risks for the both parts of Caucasus are approximately the same and the seismic activity of Southern Caucasus is larger than in the North. The sources of Hotspot Map assessments were GSHAP maps for PGA and database of EQ of  $M > 4.5$  occurred in 1976-2002 from the Advanced National System EQ Catalog. It is easy to see that GSHAP map gives for the PGA in the North mainly in the range

0.2-0.3 g and for the South – in the range 0.2-0.4 g. The number of EQ of  $M > 4.5$  is three times larger in Southern compared to Northern Caucasus. Besides, recurrence times of  $M > 4.5$  EQ-s in the North and South is approximately the same. Thus we conclude that during compilation of the Hotspot map the input data were not analyzed correctly and the map needs serious revision in Caucasus region. Earthquake risks are much larger for countries of South Caucasus, which contradicts to Hotspot Map assessments, which states that this region is prone only to hydrological risks. These discrepancies may cause serious difficulties for investors and insurance companies. We conclude that it is of major importance to refine hazard and risk assessments for South Caucasus using detail local data.