Seismic landslide hazard analysis for the territory of Georgia using GIS technologies

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Earthquake are the most devastating natural disasters which can cause thousands of deaths and billions of dollars in damaged property. It commonly triggers secondary effects, landslides among them is the most important one, and induced huge disasters in mountainous regions. The problem of earthquake induced landslides is very important for hazard assessment. Last years considerable attention has been paid to this problem. New developments in technologies, modeling, and data analyses are widely used seismic landslide research. The study of potential landslide hazard areas is very important for the territory of Georgia.

The main goal of this research was revision, updating and upgrading data base for seismic landslide hazard analysis using modern technologies. For the Racha (central Greater Caucasus) and Achara (South-west Georgia) region more detailed data base are compiled. These two regions are mountainous regions and earthquake commonly triggers landslides and induced huge disasters in the same places. Racha region are characterized with high seismic and landslides activity and for Achara region is typical y huge landslides area.

During research and field work we used multi-disciplined methodology and software . The research was based on geological, geomorphological and seismic data and Remote Sensing methods as well. After compilation of new data base, it was proceeded using ModelBuilder in Arc GIS. The data base for seismic landslide hazard assessment is compiled, old data are revised and upgraded. Few selected landslides were studied in details. We compiled a database on earthquakes that produced significant landslide, including an estimate of the total landslide area, and earthquake characteristics such as seismic moment and source depth. We compared field-gathering information, slope feature which we receive from DEM (digital elevation model), geological, seismic hazard map and finally we created landslides hazard assessment map by using above-mentioned information.