

A CONCEPTUAL APPROACH OF COUPLING GEOMORPHIC ASSESSMENTS WITH ROCK FALL AND DEBRIS FLOW HAZARD ANALYSIS ? EXAMPLES FROM WESTFJORDS, ICELAND

T. Glade

Dep. of Geography, University Bonn, Meckenheimer Allee 166, 53115 Bonn, Germany
(thomas.glade@uni-bonn.de/Fax: +49-228-739099)

Investigations on spatial landslide hazard differ significantly. This is in particular true for scientists, consultants and governmental agencies with restrained budgets and time limitations. Therefore, investigations and analysis have to be in particular focussed on the specific problem. The inherent danger in such work is not considering the overall environmental conditions carefully and consequently, to draw conclusions which are indeed appropriate to the current situation, but possibly not in conjunction with long-term trends. Traditional approaches in assessing landslide hazard include either statistical analysis of former events, mostly on small scales, or physically based modelling of specific events in given locations with detailed information on geotechnical, hydrologic and hydraulic parameters. If investigations are taken out carefully, current sediment storage and potential mobility is considered. But regularly, the reproduction of sediment is not taken into account although the rate of refilling storages, removed by previous events, is most crucial in estimating future events. Numerous communities in Iceland are heavily affected by many natural hazards, including landslides, and specifically rock falls and debris flows. As soon as both processes have occurred, sediment is partially or totally removed from the catchment. Therefore, comparable triggering conditions do not have similar responses. In Iceland, storage is refilled by continuous bedrock weathering. In addition to this process it is suggested, that sediment is also delivered from high altitude plateaus to the slopes and channels by solifluction and frost creep processes. Although not quantified yet, it is concluded, that the delivering of sediment due to these processes is most important for sediment availability for debris flows in the Westfjords in Iceland. This condition could have been determined only due to a geomorphic assessment of the whole region before investigating the factors for debris flows and rock falls in detail. Consequently it is asked to include geomorphic assessments into detailed hazard analysis as a general procedure.