



Economic landslide risk analysis in the Swabian Alb (SW-Germany)

R. Bell (1), A. Blöchl (2), T. Glade (3), B. Braun (2)

(1) Dept. of Geography, University of Bonn, Germany, (2) Dept. of Geography, University of Bamberg, Germany, (3) Dept. of Geography and Regional Research, University of Vienna, Austria (rainer@giub.uni-bonn.de/+49-228-739099)

Landslide risks in lower mountainous areas in Germany are often underestimated. Although just one event is known which caused fatalities in the Swabian Alb, landslides cause significant economic loss in this area. This mainly results from inadequate human activities which often is the consequence of a missing understanding of the landslide hazard and respective risks in the area. To demonstrate regional landslide hazard, damage potential and consequent landslide risks, new methods to estimate landslide risk were developed within the project InterRISK (Integrative landslide risk analysis and evaluation in the Swabian Alb (SW-Germany)).

Landslide susceptibility is calculated based on lithology, land use and various topographic parameters using logistic regression. Subsequently, landslide susceptibility is classified into five qualitative landslide hazard classes. The damage potential is estimated based on detailed official land use plans (Flächennutzungspläne). Average economic values for each land use unit were determined using regional economic data and replacement costs. Economic values for linear infrastructure is calculated using replacement costs. Consequently, damage potential was classified into five qualitative classes. Landslide risk is estimated using a qualitative risk matrix. Vulnerability is set to 1, meaning that the elements at risk are totally destroyed when hit by a landslide.

Although input data with low resolution had to be used (e.g. lithology at a scale of 1:200,000) the validation of the landslide hazard maps shows that approx. 70% of the mapped landslides are located in the high and very high landslide hazard class. The calculated damage potential in the whole area totals to >25 billion EUR and within known landslide areas >1.5 billion EUR. Landslide risk analysis shows that

only 1.04% of the total area are located in the high and very high risk classes. However, this refers to approx. 4.3km² which are highly at risk. Since the detailed official land use plans include also information on how the area will probably develop in the next 20 to 30 years it is possible to estimate the development of the risk in the near future. Especially this information is essential to prevent the areas most at risk to be actually developed by human activities. Thus, economic landslide risk analysis is a crucial part of a sustainable land use and risk management strategy.