



GIS Design for Gravitation Risk Management in the Middle Rhine Valley, W.-Germany

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The Middle Rhine valley is both a protected area and a major communication axis. Therefore gravitation risk is a key management issue for its economic impact. Moreover land slide phenomena are indicators of environmental changes. In the frame of UNESCO world culture heritage region of the upper middle Rhine valley a GIS based project is carried out by Johannes Gutenberg-Universität Mainz (department of Geography) in cooperation with the Research Centre of Landslides: "FSR" of University of Mainz. The main aim of this project is to supply a valuable information tool on gravitation risk to execution agencies.

Following a theoretical approach, we should run first a soil transport model as AGNPS (Agricultural Non-Point Source), and then estimate the risks by an economic cost function to supply a risk map to the decision maker. Unfortunately data input quality is heterogeneous and thus a more interactive approach has to be implemented. Using a GIS data organization allows the analyst to run a computation model only if input data are available with the required precision.

Whereas a full landslide model expects information about actual rainfall rates, geology, pedology and land use, on most of real situations some of these parameters are only roughly assessed. But we want to have some accurate digital elevation data a simple water run off model could supply accurate results. Another aim of GIS tool is to maintain primary or generated data of various accuracies in separate layers.

The data input of our system can be clustered in six groups:

- elevation

- geology
- pedology
- land use and land cover
- traffic network
- actual land slide incidents

In our presentation we will focus on elevation data and traffic network. On these two parameters (one physical and the other socio-economic) we will discuss data acquisition policy and associated numeric model which are GIS embedded. Although a complete error model is not realistic, model sensitivity can supply some guidelines to solve the usual trade off between high data cost and excellent quality.

We expect through this GIS based data system to fill the gap between human expertise and numerical modelling in a sensitive domain where accurate and reliable information are expected by decision makers.