

Landslide databases to compare regional repair and mitigation strategies of transportation infrastructure

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Regional data of the Central German Uplands are extracted from the German landslide database in order to understand the complex interactions between landslide risks and public risk awareness considering transportation infrastructure. Most information within the database is gathered by means of archive studies from inventories of emergency agencies, state, press and web archives, company and department records as well as scientific and (geo)technical literature. The information includes land use practices, repair and mitigation measures with resultant costs of the German road network as well as railroad and waterway networks. It therefore contains valuable information of historical and current landslide impacts, elements at risk and provides an overview of spatiotemporal changes in social exposure and vulnerability to landslide hazards over the last 120 years.

On a regional scale the recorded infrastructure damages, and consequential repair or mitigation measures were categorized and classified, according to relevant landslide types, processes and types of infrastructure. In a further step, the data of recent landslides are compared with historical and modern repair and mitigation measures and are correlated with socioeconomic concepts. As a result, it is possible to identify some complex interactions between landslide hazard, risk perception, and damage impact, including time lags and intensity thresholds.

The data reveal distinct concepts of repairing respectively mitigating landslides on different types of transportation infrastructure, which are not exclusively linked to higher construction efforts (e.g. embankments on railroads and channels), but changing levels of economic losses and risk perception as well. In addition, a shift from low cost prevention measures such as the removal of loose rock and vegetation, rock blasting, and catch barriers towards expensive mitigation measures such as catch fences, soil anchoring and rock nailing over time can be noticed. This temporal shift is associated with a higher public hazard awareness towards landslides which is at some sites linked to an apparent increase in landslide frequency and magnitude.

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