

The power of indicators: A physical vulnerability index for torrential hazards based on real damage data

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Changes in the frequency and magnitude of natural hazard processes in mountain areas require the application of methods for the assessment of the physical vulnerability of buildings that may demonstrate predictive power. An improved physical vulnerability index is presented based on damage data from case studies in the European Alps. The relevance of the vulnerability indicators used is investigated through scaled laboratory experiments and statistical analyses of damage data from the 2005 floods and recent debris flows in Austria. The weighting of the indicators is based on a correlation study using real damage data. The new index can be used for a variety of hazardous processes such as flash floods, hyper-concentrated flow, fluvial sediment transport and debris flow. The approach combines a list of indicators that have been used in the past (building material, condition of building, existence of surrounding objects, etc.) with some new ones such as distance between buildings, elevation of the first floor, wall thickness, as well as presence, height, construction and state of openings in the building envelope. The index is applied to case study areas that have been affected by the 2005 floods and preliminary results are presented.

The presented study is part of the following projects: “Physical vulnerability assessment using indicators. A methodological framework” (Austrian Science Fund (FWF): V-519-N29) and “Vulnerability analysis of buildings exposed to torrent hazards – small-scale experimental modelling of impacts on buildings and derivation of physics-based vulnerability functions” (Austrian Science Fund (FWF): P27400-NBL).