



## **Decrease of vulnerability of buildings by local structural protection measures**

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During the last decades, settlement activities increased in the alpine regions of Austria. Due to the scarceness of areas suitable for development, residential estates were extended into areas which are endangered by natural hazards such as mass movements or avalanches. These settlements generally show a considerable vulnerability of tangible assets.

Integral risk management strategies aim at the assessment of such endangered areas. Avoidance of endangered areas, local protection measures, preparedness of people and financial prevention are suitable instruments for reducing the vulnerability of values at risk.

According to different transport processes (flash floods with bedload transport, debris flows, rock falls and avalanches) and the structural elements of a building, local protection structures can be classified in terms of relevant impacts and protection objectives. Based on this classification, structural measures are suggested not only for new buildings but also for upgrading existing settlement structures.

As hazard maps, which can serve as a basis for the implementation of mitigation measures against natural hazards, have only the significance of an expert's report in Austria, individuals are not forced to take such maps into consideration during building activities. The Austrian Forrest Technical Service for Torrent and Avalanche Control merely has the possibility to recommend structural details and elements for buildings concerning construction materials and techniques. Thus, for endangered areas it is highly recommended, that building codes are prescribed. Further, the obligatory final inspection of buildings, which was cancelled in former times, should be reintroduced. These measures will encourage the implementation of local protection mea-

sures which will lead to a consequently decrease of vulnerability of tangible assets.