



## **Loss estimation of debris flow events in mountain areas – An integrated tool for local authorities**

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Torrents prone to debris flows regularly cause extensive destruction of the built environment, loss of life stock, agricultural land and loss of life in mountain areas. Climate change may increase the frequency and intensity of such events. On the other hand, extensive development of mountain areas is expected to change the spatial pattern of elements at risk exposed and their vulnerability. Consequently, the costs of debris flow events are likely to increase in the coming years. Local authorities responsible for disaster risk reduction are in need of tools that may enable them to assess the future consequences of debris flow events, in particular with respect to the vulnerability of elements at risk.

An integrated tool for loss estimation is presented here which is based on a newly developed vulnerability curve and which is applied in test sites in the Province of South Tyrol, Italy. The tool has a dual function: 1) continuous updating of the database regarding damages and process intensities that will eventually improve the existing vulnerability curve and 2) loss estimation of future events and hypothetical events or built environment scenarios by using the existing curve. The tool integrates the vulnerability curve together with new user friendly forms of damage documentation. The integrated tool presented here can be used by local authorities not only for the recording of damage caused by debris flows and the allocation of compensation to the owners of damaged buildings but also for land use planning, cost benefit analysis of structural protection measures and emergency planning.