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Loss estimation of future debris flow events in alpine areas-The application of a vulnerability analysis method in Martell Valley (South Tyrol, Italy)

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Alpine areas suffer often the consequences of debris flow events such as damage or total destruction of buildings and infrastructure, loss of animal stock and agricultural areas and, sometimes, loss of life. Due to climate change the intensity and frequency of such events is likely to increase, however, due to socio economic changes the spatial pattern of the vulnerability of the elements at risk is also going to change. Decision makers, local authorities and other stakeholders are in need of tools that will assist them in estimating the loss of future catastrophic events considering both climatic and socioeconomic change.

In this contribution, the economic cost of the consequences that a past event would have under the present circumstances is assessed. The approach is based on a new vulnerability curve which was developed based on data from the catastrophic event of 1987 in Martell valley, South Tyrol, Italy. By using a series of Orthophotos from different years until today the current exposure pattern was identified. The vulnerability curve was used in order to calculate the economic loss that an event identical to the one of 1987 would cause today. The results and the methodology used can form a valuable tool in the hands of local authorities as they can be used for decision making, cost benefit analysis for structural protection measures, land use planning and emergency management operations.