



An indicator-based methodology for vulnerability assessment in alpine areas

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Alpine communities suffer often from a series of natural hazards that compose the overall natural risk to a certain area. Although there is a need for a multi-hazard approach, the vast majority of the studies regarding hazard assessment address single hazards. As far as vulnerability assessment is concerned, the number of studies considering multi-hazard is even more limited. However, natural hazards differ significantly concerning their characteristics as time of onset, duration, extent, impact on elements at risk (buildings, humans etc.). Consequently, these highlighted differences result in difficulties concerning the direct comparability of hazards but also in unequal behavior of elements at risk towards the impact of the different hazard types. Currently, methods to assess the vulnerability for each process are limited to vulnerability curves and matrices. However, vulnerability curves are not available for all processes because they are especially employed for processes affecting large areas such as earthquakes, storms and floods since large amounts of data are needed to derive curves. Furthermore, vulnerability curves do not include any information on what makes the elements at risk vulnerable to serve as basis for vulnerability and thus risk reduction measures.

In this study we propose an indicator-based method to assess physical vulnerability to alpine hazards which 1) takes into consideration all the characteristics of the elements at risk that influence their vulnerability to the whole set of hazards that the elements are susceptible to and 2) can be used for different purposes (prevention, emergency management, etc.) and by various end users (local authorities, emergency services etc.) providing transparent and supportive information. A case study is carried out in the basin of Barcelonnette, France, and the first results will be presented.