



## Multi-hazard risk analysis for management strategies

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Risk management is very often operating in a reactive way, responding to an event, instead of proactive starting with risk analysis and building up the whole process of risk evaluation, prevention, event management and regeneration.

Since damage and losses from natural hazards raise continuously more and more studies, concepts (e.g. Switzerland or South Tyrol-Bolzano) and software packages (e.g. ARMAGEDOM, HAZUS or RiskScape) are developed to guide, standardize and facilitate the risk analysis. But these approaches focus on different aspects and are mostly closely adapted to the situation (legislation, organization of the administration, specific processes etc.) of the specific country or region.

We propose in this study the development of a flexible methodology for multi-hazard risk analysis, identifying the stakeholders and their needs, processes and their characteristics, modeling approaches as well as incoherencies occurring by combining all these different aspects. Based on this concept a flexible software package will be established consisting of ArcGIS as central base and being complemented by various modules for hazard modeling, vulnerability assessment and risk calculation. Not all modules will be developed newly but taken from the current state-of-the-art and connected or integrated into ArcGIS. For this purpose two study sites, Valtellina in Italy and Bachelonnette in France, were chosen and the hazards types debris flows, rockfalls, landslides, avalanches and floods are planned to be included in the tool for a regional multi-hazard risk analysis. Since the central idea of this tool is its flexibility this will only be a first step, in the future further processes and scales can be included and the instrument thus adapted to any study site.