



From risk assessment to disaster preparedness and response at a regional scale

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Increased population density, its wealth and activities is leading to an amplification of risk conditions from landslide hazards in mountain areas. In Valtellina Valley (Italian Central Alps), debris flow hazards cause severe damage and casualties frequently. For that purpose, a hazard and risk analysis is performed at a regional scale. Then, for each risk scenario, a workflow including the operational steps and rules to be followed in case a prospective damaging event occurs, has been set up and managed by a Decision Support System (integrated in a GIS).

A debris flow susceptibility map combined with temporal occurrence of debris flows resulted in debris flow initiation map. This served as the principal input for runout modelling to obtain hazard maps at medium scale. Afterwards, medium scale risk maps were prepared by overlaying hazard maps with the elements at risk database. Three risk maps have been derived: the former two maps quantify economic risk from debris flows and the third one qualitatively delimits total risk areas.

Then, contingency plans targeted to cope with disaster preparedness and response are “attached” to each risk scenario previously defined. The methodology here proposed takes advantage of data processing capabilities by Geographical Information Systems (GIS), workflow management modules by Decision Support Systems (DSS), and communication systems by Information and Communication Technology (ICT). The main aim is to set up, manage, and coordinate contingency plans in advance, before a crisis phase occurs. That is, to identify and prepare people in charge to take actions, define the activities to be performed, be aware of available resources, and optimizes the communication system for the transfer of knowledge, in order to efficiently face a prospective crisis phase. In this way, contingency plans anticipate the demands for a disaster relief operation and indicate the most effective way of joining the main requirements.