



Cost-Benefit analysis for debris avalanche risk management

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Two years after the failure of a 1.2 million mc debris avalanche in December 2002 on the village of Bindo (Cortenova, Italy), a large portion of slope is still active and threatens a part of the village, causing a high potential risk. Considering the characteristics of both the landslide and the socio-economic settings, we identified three possible mitigation strategy: (1) construction of a large defensive work in front of the potential landslide; (2) continuous monitoring of the unstable sector of the slope, with a real-time alarm system; (3) a combination of (1) and (2). The three strategies have been also compared with an hypothetical zero-strategy, without any mitigation action. Based on physically-based landslide modelling we built several hazard scenarios and we used those scenarios for risk analysis and for the assessment of the residual risks related with each mitigation strategy. For such analysis, we considered only the direct effects on human life, houses and life-lines. At the same time, we defined levels of social acceptance of landslide risk for the endangered community by means of questionnaires and socio-economic data, and we found that the residual risks associated with all the three mitigation strategies were tolerable by the community. Finally, in order to provide support to politicians and to identify the mitigation strategy with the lowest cost/benefit ratio, we performed a cost-benefit analysis of the different scenarios, and we found that, even with a large uncertainty, the best mitigation strategy would be the combination of defensive works and monitoring.