



Debris flow risk mapping on medium scale and estimation of prospective economic losses

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Delimitation of potential zones affected by debris flow hazard, mapping of areas at risk, and estimation of future economic damage provides important information for spatial planners and local administrators in all countries endangered by this type of phenomena. This study presents a medium scale (1:25 000 – 1: 50 000) analysis applied in the Consortium of Mountain Municipalities of Valtellina di Tirano (Italian Alps, Lombardy Region). In this area a debris flow hazard map was coupled with the information about the elements at risk to obtain monetary values of prospective damage. Two available hazard maps were obtained from GIS medium scale modelling. Probability estimations of debris flow occurrence were calculated using existing susceptibility maps and two sets of aerial images. Value to the elements at risk was assigned according to the official information on housing costs and land value from the Territorial Agency of Lombardy Region. In the first risk map vulnerability values were assumed to be 1. The second risk map uses three classes of vulnerability values qualitatively estimated according to the debris flow possible propagation. Risk curves summarizing the possible economic losses were calculated. Finally these maps of economic risk were compared to maps derived from qualitative evaluation of the values of the elements at risk.