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State-of-the Art of hazard mapping in a mountain village: a case study in South Tyrol

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The recent catastrophes occurred in Italy have raised the concern about the delicate equilibrium between human settlements and natural hazards.
Numerous laws and regional directives have been put in place in order to establish new rules for future urbanization, especially in mountain areas. Here numerous are the hazards threatening the territory: snow avalanches, rockfall, landslides, debris flow, floods.
The objective of this work is to illustrate a procedure for the elaboration of a hazard map for a mountain village in South Tyrol, and to describe the obtained results. Snow avalanches, rockfalls, debris flow, landslide and floods have been considered as the potential hazard.
This work represents an inter-sectorial effort which encompasses different capabilities and expertise to evaluate natural hazards in mountain regions; in particular, geological studies, forestry analyses and engineering calculations proved to be essential in this context.
The most advanced techniques available from research in the field and softwares have been used, such as the hydrological model GEOtop (www.geotop.org) for the precipitation analysis and landslides susceptibility, the model TRENT-2D for the propagation of the debris flow, and other advanced models for the flood forecasting and rockfall simulation.