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Evaluation of future impacts of global change in mountainous areas with a a novel multi-risk assessment web-tool

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Natural hazards are usually examined and managed separately. Only few studies show multiple threats analyzes where the overall hazards and/or risks are assessed jointly. When considering such joint analyses, numerous challenges and difficulties arise, since multi-risks approaches need to model mountain hazards and exposure of elements in an integrated way while being compliant with observations. The physical processes, mainly governed by hydro-meteorological triggers, increase the pressure on social or natural systems, producing important modifications on the environment. To cope with this situation, short-term proactive adaptation plans are needed. To address such issues, technical specialists covering physical, social, and economic aspects of the problem, having experiences of mountainous environments and being familiar with perspectives of development of these territories at a different scale must be solicited. The model proposed in our work was specifically design to take into account the particularities of mountainous areas and to implement these multidisciplinary issues. The objective of this work, implemented in the French national project SAMCO (Society Adaptation for coping with Mountain risks in a global change COntext), was to identify key factors (e.g., exposure scenarios, hazard levels, and impacts on stakes at risks) to identify risk management strategies adapted to reduce the possible impacts (landslides, rockfalls, floods) of global changes, until the 2100 horizon. To fulfill this goal, we proposed a methodological framework able to bring together different scientists working on environmental and social sciences for developing necessary tools able to assess risks in mountainous areas, for the present, but also for future periods. The main result of the SAMCO project was to design and disseminate the results through a web-platform. As presented in the following, we developed this platform thanks to a web-architecture based on Geographical Information Systems (GIS) and communication technologies, which are able to manage multi-geohazard/risk impact maps referring to the different socio-economical pathways. This web-tool offers to the deciders the possibility to choose between the best strategies improving the resilience of the territory for which they are responsible.