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Integrated use of 2D numerical models and empirical approaches for Debris Flow Hazard mapping in Southern mountains of Perú.

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ABSTRACT

Debris flows are rapid mass movements of unconsolidated and mixed water and debris which drags any component of a landscape in its path (trees, stones, houses, etc.) are caused by the weakening of the hillsides, as a result of intense precipitation over deforested areas. Also usually caused by the overflow of a river, a lake or the detachment of ice in the snow. The case of study is located in the area of the National sanctuary of Ampay Glacier specifically on the southern side at the southeast Andes of Peru. A debris flow occurred in March 18, 2012 is evaluated for modelling, its triggering and mobilizing processes play a role for the back calculation feeding two numerical physically based models which analyze the propagation of debris flow events in scenarios that allow focus on what to observe in the field and to improve both disaster reduction measures and hazard assessment. The research evaluated a debris flow hazard in Sahuanay Basin using different scenarios with a certain return period with a pragmatic approach to integrate RAMMS+FLO-2D models and empirical relations, essentially with the support of field surveys and local expertise in order to get consistent estimations and less uncertainty in results.