

## Prevention of disasters related to unstable slopes in Peru

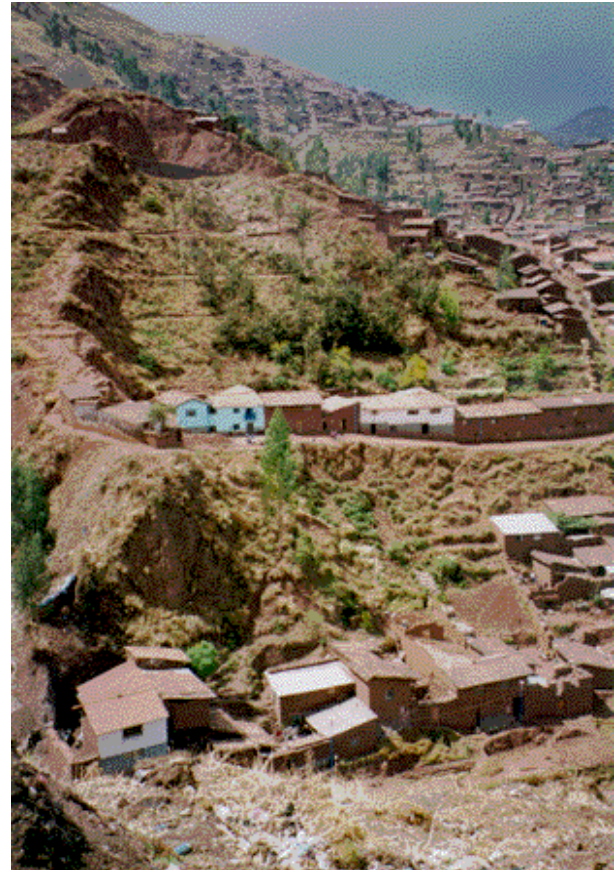
The division Humanitarian Aid and Swiss Disaster Relief Unit of the Swiss Confederation has developed prevention projects for several years dealing with natural and anthropic risks. Within such a frame a prevention pilot study has been set up to determine potential disasters related to unstable slopes in the Cusco and Inca Sacred valleys, in Peru; with the project this region will benefit of the experience gained at the LMS and before by the CETI (Research Center on Unstable Slopes).

This research aims first at insuring a knowledge transfer in the field of detection, identification and mapping of landslides from Switzerland towards Peru, where numerous unknown unstable zones directly threaten the development of urban and rural communities. Its second aim consists in turning out local executives in order to allow a better assessment of slope instability potential dangers in a multidisciplinary perspective. Finally it is foreseen to widely spread the obtained results among all related authorities, so that they consider more seriously the hazards related to unstable slopes and develop a real risk management policy.

After a first investigation stage over some 500 km<sup>2</sup>, aiming at identifying, characterizing and assessing the different instability phenomena, among which only 20 to 30% are known, a detailed mapping at a scale 1:10'000 has been undertaken using the techniques and the mapping methods developed at EPFL, but including their adjustment to the fixed aims.

On the other hand, training courses and field works have been set up in order to teach these mapping techniques and test their large scale applicability. These slow and little striking phenomena (Fig. 1) must be seriously taken into account as they happen to be very destructive, like in 1674 when a landslide formed a lake near the town of Urubamba, causing the death of more than 300 persons, or like in 1997 when a landslide killed more than 200 people in the nearby town of Abancay.

This project is carried out in close collaboration with another project of the Swiss Disaster Relief Unit in Ecuador for which LMS also gives some advice.



*Fig. 1 View of an unstable zone in the surroundings of Cusco city centre (Peru); the new buildings develop very quickly in exposed zones*

### Publication

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- Carreño R., Bonnard Ch. 1997. Proepti : un proyecto de inventario y evaluación de fenómenos de inestabilidad de masa en la Cuenca de Cusco-Perú. *2<sup>e</sup> Symp. latinoamericano de deslizamientos de tierra*. Rio de Janeiro, 10-14 nov. 1997