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Assessment of Remote Geohazards in Pamir, Tajikistan

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In 2002 and 2003, two missions have been carried out in Pamir, Tajikistan, sponsored by SHA/SDC of Switzerland, to assess the remote geohazards (Mass Movements and GLOF's - Glacial Lake Outburst Floods), focused on the Vanch Valley as well as the Gunt, Shahdara and Pjanch Valleys in the Western Pamir Mountains.

The inventory of glacial lakes and areas prone to mass movements was based on multi-temporal remote sensing images (Corona 1968, Landsat ETM+ 2000/1, Terra Aster 2002/3), two aerial surveys by helicopters and terrestrial investigation of selected sites to confirm the hazards. Interpretation of seismic data concerning the triggering of mass movements and GLOF´s, meteorological and hydrological data interpretation as well as debris flow calculation and estimation of impact zones were carried out to determine the risk potential of these hazards.

It was a main task of this missions to create a Hazard Indication Map for assessing the hazards in terms of their possible impact to the population and infrastructure below. Over four hundred sites were classified within the investigation areas and ranked according to their hazard potential. After screening, areas with the highest hazard potential could be identified and specific sites determined:

- Sites with high potential for GLOF's, ranked according to lake and dam type, size, maximal discharge and possible impact to the downstream area.
- Sites with potential landslides or with active sagging (deep seated gravitational creep) with the potential to form va barrier across the valley floor.
- Sites with massive rock falls and rock slides as well as possible debris flows.
- Sites with active tectonic fault zones affecting the stability of the slopes.

Seismicity plays an important role in triggering mass movements in Western Pamir. Two categories can be distinguished: Deep focus earthquakes originating primarily in the Hindukush and shallow earthquakes respectively, originating in the Pamir itself. Further seismic risk assessment is under way.

During the investigations, the remnants of several recent catastrophic events, such as broken natural dams with resulted flooding could be observed. This underlines the possible future occurrence of large remote geohazards, but fortunately, they seem to have a low recurrence rate. The results of these investigations were presented in local workshops and also handed out to the relevant authorities.