



Towards a set of general recommendations for assessing glacier and permafrost hazards in mountains

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The working group on "Glacier and permafrost hazards in mountains" by the Commission on Cryospheric Sciences (CCS) and the International Permafrost Association (IPA) aims among other goals at compiling a set of general recommendations, which should support and direct assessments of glacier- and permafrost-related hazards in mountains. Here, a draft of the recommendations is presented:

(1) Climate change can induce disturbance in glacier and permafrost equilibrium and can shift hazard zones beyond historical knowledge. In many regions, human settlements and activities extend towards endangered zones increasing local vulnerability. As a result, historical data alone are not sufficient any more for hazard assessments and have to be combined with new observation and modelling approaches.

(2) Glacier- and permafrost-related disasters often include a combination of processes and chain reactions. Hazard assessments therefore have to be integrative and consider such variety and interaction of processes.

(3) Due to the accelerated change of high-mountain environments, hazard assessments must be undertaken routinely and regularly, combined with appropriate monitoring.

(4) Integrative risk assessments should be achieved by interdisciplinary co-operation of experts, and the application of modern observation and modelling techniques designed for such integrative approaches. Risk assessment requires the assessment of hazard and vulnerability.

(5) Modern space technologies enable initial estimation of hazard potentials to be performed by virtually everyone and everywhere, independent of political and geographical restrictions. This fundamental "democratisation" process related to high-mountain (and other) hazards involves a number of new opportunities, dangers and responsibil-

ities, for the public, the authorities in charge, and the experts involved.

(6) The transfer and dissemination of expert hazard assessments to the authorities and to the public, and thus the efficiency of assessments, is to a large degree dependent on the socio-economic and cultural context and the hazard perception of the endangered population. Communication of results from glacier and permafrost hazard assessments should consider these circumstances.