



Process chains in high mountain areas and multi-hazards of different scales – the Barsem disaster, Tajikistan

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Changes in high-mountain environments are responsible for new and challenging multi-hazard conditions and materialize in particular through cases such as the Barsem disaster (Pamir, Tajikistan) in July 2015. At least 14 major debris flows occurred in the Barsem Valley within four days during a period of exceptional meteorological conditions. The flows transported large volumes of debris on the fan where the village Barsem with about 1,500 inhabitants is located. As a result, 80 homes were completely destroyed, and one person went lost. Moreover, the debris dammed the Gunt River, forming a lake of two kilometers length and endangering the local power supply. The lake interrupted the Pamir Highway and the potential lake outburst threatened the downstream communities along the valley as well as Khorog, the capital of the Gorno Badakhshan Autonomous Oblast. The damage was caused directly by the debris flows deposits and by subsequent flooding as a consequence of dammed Gunt River.

This contribution will provide a first analysis of the conditions in the debris flow starting zone and the triggering of the event, the sediment connectivity during the event and further consequences downstream related to the accumulated debris dam at the Gunt River. Furthermore, the analysis will be supported by a comparison between different events in the Pamir region and the European Alps focusing on geomorphological features in the starting zone, processes sequences, process-process interactions but also on emerging multi-hazard situation in this context. Increasing challenges due to changes in the high-mountain environment will be discussed for the Pamir region as well as the comparability between different mountain regions.