

# **Historical records of snow avalanche events as guidance for preventive spatial planning: Case study of Washich Village, Tehsil Torkho, District Chitral, Khyber Pukhtunkhwa**

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## **Abstract**

Snow avalanche is an important and very active geomorphic process in high mountains, and are one of the most important natural hazards which acting on the mountain environment, cause each year several fatalities and burials/injuries. Experts on the subject cannot predict, nor do they completely understand each and every avalanche occurrence. The slope failure associated with an avalanche is caused by several factors, but primarily by large accumulation of snow on a steep slope. If it is too small, the component gravity force along too gentle slope is not strong enough to initiate an avalanche. On the other hand, on too steep slopes, big lasting deposition is not possible and so a coherent snow mass does not occur here. Avalanches occur on slopes averaging  $25^{\circ}$  and  $55^{\circ}$ , and the majority is on slopes between  $30^{\circ}$  and  $40^{\circ}$  like in the Washich village, Chitral District. They are triggered by natural, seismic or climatic factors such as earthquakes, thermal changes, and blizzards, and by human activities.

Pakistan has a history of tragic events of snow avalanches. Average fatalities of 39/year reported from 2005-2014 (FOCUS internal data) which also justified that Pakistan is one of the highest vulnerable country in regards to avalanche hazard. Avalanches cannot be considered as a problem limited mainly to local inhabitants of mountainous areas or to their properties and infrastructures. They often affect tourists/sportsmen coming from other regions and countries. It is impossible to determine how many avalanches of all sizes occur in northern part of Pakistan but Washich is one of the most snow avalanche hazard prone villages in District Chitral, KPK. Small avalanches occur throughout the winter and spring, however, in 2007, 42 casualties were occurred due to an unexpected single avalanche event in early spring season. The most common types of avalanches in Washich village are loose-snow, wet and slab avalanches which are responsible for damages of households, infrastructures etc.

Spatial planning is a key instrument for reducing the vulnerability of society against natural hazards, but its potential is yet to be fully utilized. Systematic use of historical data and local knowledge on natural hazards, seems to be one pre-requisite for improvement.

It is recommended that local administrative units like UC activate local knowledge on historical natural hazards events and implement these insights in land use planning. This could be done by appointing a group with mandate to establish a database of natural hazards events, potentially stimulating community commitment to hazard prevention. Systematizing of professional reports, archive inquiries and interviews with elderly people would be appropriate methods. Interpretation of historical information needs to be assisted by geological expertise, and should be a supplement to expert's investigation.