

## Breaking-off of hanging glaciers at Mt. Langtang Lirung, Nepal Himaraya

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On 25 April 2015, an earthquake (M7.8) occurred at Gurkha region located northwest of Kathmandu, the capital of Nepal. On 12 May, an earthquake of M 7.3 occurred at 80 km northeast from Kathmandu. Due to this series of large earthquakes, slope failure events (ice avalanche, snow avalanche, snow-rock avalanche, rock avalanche) occurred frequently in the snow mountain area of the Himalaya. In Langtang valley located in the north of Kathmandu, catastrophic ice-rock avalanches covered the village, caused serious damages such as more than 350 victims at Langtang village (Fujita et al., 2016 ; Kargel et al., 2015). The source of the ice-rock avalanches are believed to be the falling of hanging glaciers and avalanches of snow accumulated in large quantities. We investigated the distribution and characteristics of the hanging glacier at the southwest face and the east face of Mt. Langtang Lirung using the aerial images from helicopter and satellite images of Google Earth before and after the earthquake. In addition, we examined the surface changes the ice-rock avalanche deposits using DSMs (digital surface models) made with aerial images from helicopter in autumn 2015 and 2017.

Keywords: slope failure, hanging glacier, Langtang Valley, Gurkha earthquake