

Normally collapse of hanging glaciers at Mt. Langtang Lirung in Nepal

*Kosuke Matsumoto², Chiyuki Narama¹, Honami Watanabe³, Katsuhisa Kawashima¹, Hiroshi YAGI⁴, Daisuke Higaki⁵, Akihiko Wakai⁶

1. Niigata University, 2. Graduate school of Niigata University, 3. RESTEC, 4. Yamagata University, 5. Hirosaki University, 6. Gunma University

In April 2015, a huge earthquake called the Gorka Earthquake occurred near Kathmandu, the capital of Nepal. The Gorka earthquake triggered the collapse of hanging glaciers at Mt. Langtang Lirung. and caused severe damage in the Langtang village located at the bottom of the valley due to the avalanche of snow and ice debris(Kargel et al., 2015). A hanging glacier is a glacier that sticks to a steep hillside or overhangs a cliff. Because a hanging glacier exist in unstable places, they have the characteristic that they collapse in normal times without earthquakes, and the shape of the glaciers is maintained by repeated collapse. Taconnaz hanging glacier in the French Alps has been shown to have a collapse cycle of only half a year(Le Meur and Vincent, 2006). In Europe, the damage caused by the collapse of hanging glaciers in normal times has been reported, and hanging glaciers can cause disasters even in normal times without external factors such as earthquakes. The monitoring hanging glaciers collapse has been performed only in a few places in the European Alps. The amount of collapses, the cycle of collapses, and the topographic features of collapses are not clear in 7000m-class mountainous regions such as the Himalayas. In this study, I created orthophotos and DSM from helicopter aerial images taken in June and October 2015, November 2018, and November 2019, targeting hanging glaciers at Mt. Langtang Lirung in Nepal. By comparing each period, the amount and cycle of the collapse of hanging glaciers in normal times were investigated, and the characteristics of the collapse were considered.

Keywords: hanging glaciers, collapse, Mt. Langtang Lirung, SfM