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Study on the formation condition of glacial lakes in the Himalayas

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The Himalayas contain many debris-covered glaciers, some of which have large glacial lakes at the terminus. These lakes have been growing in size since the 1950s and 1960s, giving rise to the potential hazard of glacial-lake outburst floods.

It was already clarified that glacial lake formed that those glaciers which surface slop is less than 2 degrees and glacier surface lowering since the Little Ice Age is larger than 60 m using topographical maps (Sakai and Fujita, 2010). In this study, glacier slopes and DGM are analysed using high accurate ALOS/PRISM(Advanced Land Observing Satellite/ Panchromatic Remote-sensing Instrument for Stereo Mapping) DEM (Digital Elevation Model). The study areas were Khumbu region in the Nepal Himalaya, Tibet and Bhutan Himalayas.

The result indicated that formation conditions of glacial lakes using ALOS/PRISM DEM were same with the analysis of topographical maps. It was also clarified that large glaciers tend to have large surface lowering and gentle slopes.

In the presentation we examine the result in terms of ablation processes of debris-covered glaciers.

Keywords: glacial lake, glacier, moraine, ablation