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. Several researchers reported that in the Himalayas, glacial lakes form in those parts of the glacier where the inclination of the glacier surface is < 2°. There are some glaciers with the inclination is < 2°, although they have no glacial lake.

In the present study, we analysed two easily measurable topographic parameters: inclination of the glacier surface and the difference in height between the glacier surface and lateral moraine ridges (herein, this difference is referred to as DGM, which is an indicator of glacier surface lowering on debris-covered glaciers) at Khumbu region (Nepal) and Bhutan Himalaya using ALOS-PRISM (Advanced Land Observing Satellite/Panchromatic Remote-sensing Instrument for Stereo Mapping) Satellite Digital Elevation Model.

The result indicated that glaciers with large supraglacial lakes tend to have larger values of DGM exceed 50 m and less average inclination of the glacier surface.