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Impulse wave generated by glacier avalanches and its effect on GLOFs

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Landslides, rock falls, snow avalanches, and glacier calvings may generate large water waves in the glacial lakes. These tsunami-type waves, called as impulse waves, can cause GLOF due to run-up or even destruction of the moraine dams. Although a considerable number of general model studies exist, the prediction of impulse wave features remain challenging. Most general model studies provide an empirical equation for the maximum wave features in the slide impact zone. However, the wave height, wave amplitude, wave period, and wavelength at a specific location of the lakes have to be available to determine the effects of impulse waves on a dam.

In this study the generation and propagation of the impulse waves were investigated in a small channel experimentally and, then, numerical simulations were carried out not only for the small scale but also for the glacial lakes in Bhutan.

Keywords: Glacial lake, Glacier avalanche, Tsunami