

LESSONS FROM LADAKH'S GLACIAL LAKE OUTBURST

Relevant for: Geography | Topic: Various Landforms, Changes Therein and the Effects of Such Changes

Being prepared: The thawing of ice cores may accelerate in the future due to global warming, and there is an urgent need of better risk assessment and early warning. | Photo Credit:

[Marcus Nüsser](#)

In August 2014, a glacial lake outburst flood hit the village of Gya in Ladakh, destroying houses, fields and bridges. Using remote sensing data, researchers from Germany have mapped the evolution of Gya glacial lake and note the cause of the flood. In a paper recently published in *Natural Hazards*, the team notes that this case study “illustrates the problem of potentially hazardous lakes being overlooked.”

Most interesting was finding the cause of the flood — it was not a spillover but rather a tunnelling drainage process. “Imagine a bucket full of water. It can overflow when you drop a stone, or the water can drain if there is a hole under the bucket. Similarly, here the flooding did not happen due to the spillovers due to an avalanche or landslide, rather there was a thawing of the ice cores in the moraine [a field of dirt and rocks that have been pushed along by the glacier as it moves] which drained through the subsurface tunnels,” explains Ravi Baghel from the South Asia Institute, Geography department, Heidelberg University, and an author of the paper.

The team notes that such thawing of ice cores may accelerate in the future due to global climate change, and there is an urgent need to use multiple methods for better risk assessment and early warning.

“It is almost certain that other glacial lake outburst floods will happen all over the Indian Himalaya. However, not all of these events have catastrophic outcomes. It largely depends on urban planning, the size of the lake, the distance between the lake and affected villages, the valley section and some more aspects. In some cases, cloudbursts can also trigger glacial lake outburst flood events like in the Kedarnath disaster in 2013,” explains the lead author Marcus Nüsser from the Heidelberg Centre for the Environment in an email to *The Hindu*.

He adds that in different sections of the Himalaya the occurrence of such floods has received different attention.

“While these events have been regarded as a major risk in the central Himalayan region including Sikkim, the arid Trans-Himalayan regions of Ladakh have received attention only recently. Here the glaciers are located at high altitudes not lower than 5,200 m and most glaciers are of small size. Likewise, the glacial lakes are quite small in size. In the case of the Gya lake at 5,400 m, the lake is almost always ice-covered, even during summer,” writes Dr. Nüsser.

The team adds more bathymetric studies are needed to analyse lake volumes, and it is important to regularly monitor lake development and dynamics. New, sophisticated technologies can also be put to use to understand the stability of the moraines that dam the lake. “However, it is definitely not only a question of technology but also of land use planning and accessibility,” he concludes.

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