

Earth scientists call for prevention and warning systems for Himalayan flooding events

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A pair of earth scientists at the Indian Institute of Technology–Kanpur are calling for flood prevention and warning systems in areas around the Himalayan mountains to protect people from floods or to warn them of impending disasters. In their Perspectives piece published in the journal *Science*, Tanuj Shukla and Indra Sen point out that rising temperatures due to global warming are leading to an increase in flood danger for people who live in the area.

As Shukla and Sen note, the Himalayas hold the most ice anywhere on the planet outside of the [polar regions](#)—snow-covered mountains and glaciers hold on to massive amounts of [water](#). In the past, as snow and ice have melted in the warmer months, [mountain](#) lakes have formed with natural dams holding them in place. But prior research has shown that increases in the amount of water buildup in such lakes and melting of the ice in the rocky material that makes up natural dams can lead to massive floods. Just eight years

ago, they note, melting ice in northern India led to an avalanche that pushed the moraine holding back the water in Chorabari Lake past its breaking point. The water careening down the mountain, carrying with it boulders, trees and other debris, wound up killing over 5,000 people. Such events are common enough to have been given a name—glacial lake outburst floods (GLOFs). They can also be caused by extreme rain events during Monsoon season, which, due to global warming, are happening more often.

Shukla and Sen point out that as the planet grows warmer, more GLOFs are certain to occur. But they also note that the same outcomes are not inevitable. They suggest that the construction of reservoirs to hold excess rain, structures to divert water, detention basins along with embankments and terracing could prevent such flooding. They also suggest improvements in technology could help—upgrading cell service in the region, for example, would allow people upstream to call and warn those living downstream. They also suggest building a satellite network that could be used to monitor troublesome areas. Taken together, such technology could form the basis of an early warning system. Without such action, they warn, millions of people could lose their lives in the coming years.

More information: Tanuj Shukla et al. Preparing for floods on the Third Pole, *Science* (2021). [DOI: 10.1126/science.abh3558](https://doi.org/10.1126/science.abh3558)

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