

South Lhonak GLOF Triggered Flood in Teesta Because Warnings Remained Neglected

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On May 13, 2022, Sikkim's Information and Public Relations Department issued a press release about the risks posed in the event of Glacial Lake Outburst Floods at the South Lhonak and Shako Cho glacial lakes. It quoted DG Shrestha, Director, Sikkim Department of Science and Technology, who had highlighted the South Lhonak lake's increasing size and urgent need for an Early Warning System for these glacial lakes in Sikkim.

In a presentation made at a National Disaster Management Authority conference, Ada Lawrence of the Sikkim State Disaster Management Authority had proposed an expert committee to study and evaluate the 10 vulnerable glacial lakes in Sikkim and to work out appropriate mitigation strategies against GLOF.

Thus, state and national authorities knew that South Lhonak glacial lake is highly vulnerable to a GLOF event because the 60 metre high, 1200 MW Teesta 3 Hydroelectric Project is only 50 km downstream as the crow flies. But the flash floods triggered on the night of October 3-4 showed that there was no early warning issued in time to downstream communities.

An account on page 73 of the CAG of India's 'Performance Audit on Schemes for Flood Control and Flood Forecasting' (Report No 10 of 2017) shows how much of Sikkim is flood prone. In its territory of 7.10 lakh hectares, in 1976, the Rashtriya Barh Aayog found that 0.00 lakh hectares are flood prone areas (FPA)! The state government's FPA estimate is 0.20 lakh hectares.

The region, which is home to several glacial lakes, whose GLOF hazards were known to glacier experts, used to under-estimate its susceptibility to floods until the mid-1970s! However, with increased development activities and the mania for hydropower that

engulfed the state in the last 20 years, GLOF-triggered flash floods are a very real threat.

The same CAG audit report further said this on GLOFs, on page 80:

“The work on monitoring glacial lakes in the Himalayan region was taken up by CWC in 2009. The inventory of Glacial Lakes was prepared in 2011 based on satellite images taken in 2009. As per inventory there were 2027 glacial lakes/water bodies > 10 h. area. Since 2011, monitoring of only 477 glacial lakes/ water bodies having water spread of more than 50 h. was done every year during monsoon (June to October).”

CAG auditors should have pressed the Central Water Commission to make available for audit all the monitoring reports of these glacial lakes, or at least a dozen of them that have been identified as most vulnerable. CAG auditors appear to have not investigated the preparedness for GLOF and the monitoring of glacial lakes beyond accepting CWC's claims at face value. Had they consulted a person who lived in Sikkim on a glacier-fed watercourse, they would have encountered a different level of urgency.

Also read: Sikkim Disaster: Were Successive Alarm Bells Ignored?

In a story in *Scroll*, CWC officials claim that glacial lakes that pose the risk of GLOF are monitoring through satellite data on a monthly basis. If this claim is true, among the records there must be a report on the South Lhonak Glacial Lake for September. Satellite images released in the public domain by ISRO show that the South Lhonak Lake grew by 3% on 11-28 September. Was this analysed in the monitoring report for September and communicated with the Sikkim State Disaster Management Authority as a heads-up for an impending disaster?

A statement from a senior civil servant working in Sikkim shows that there was no coordination even hours after the South Lhonak Lake had burst its banks. He writes:

“The order to open gates of Dikchu Dam was given at 2.00 AM in the morning of 4th October 2023. Only when the floodwaters had already hit Dikchu Dam. So, when the Chungthang Dam breached the information was not available at (the downstream) Dikchu dam. Which means the early warning system was not in place. There was no notified chain of commands.”

In a Twitter thread, Kerala-based civil engineer James Wilson states:

“Let's look at CWC Advisory Sheet on GLOF – South Lhonak Glacial Lake of 2015. CWC identified South Lhonak Lake as a potential hazard with an estimated area of 136 hectares and having water volume of 40.8 Million Cubic Metre in the year 2015 itself.”

He adds that a highly sophisticated mathematical model (MIKE-11) employed by CWC to estimate the GLOF generated runoff found that if the South Lhonak Lake had burst in the 2015 monsoons, it would have drained out 6,210 cubic metres of water per second in two hours!

Affected communities downstream are busy organising relief. They feel that this disaster shall not be passed off as yet another flash flood following a cloudburst. They feel that tough questions will be asked about the cascading effect of a series of hydropower dams that were constructed, throwing the concerns raised by geologists to the winds.

“I think the risks of South Lhonak GLOF and what SSDMA was doing on the mitigation front was known only bureaucratic circles. However, local communities downstream were not kept informed about the risks generated by a likely event of a GLOF at South Lhonak or Shako Cho glacial lakes,” said Mona Chhetri, a researcher based in Gangtok. She feels that in the discussions and conversations after the Teesta flash floods, the role played by downstream hydropower dams is crucially missing. She adds that it might have been triggered by a natural disaster such as GLOF, but the absence of an Early Warning System and the failure to open the dam gates at Teesta 3 Hydropower Dam needs to be talked about.

Unfortunately, even as this GLOF-triggered flash flood was knocking at their doors, the Sikkim bureaucracy was busy issuing gazette notification to acquire land from farmers to construct yet another hydropower dam on the Teesta River basin, namely the 520 MW Teesta IV Hydroelectric Project!

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