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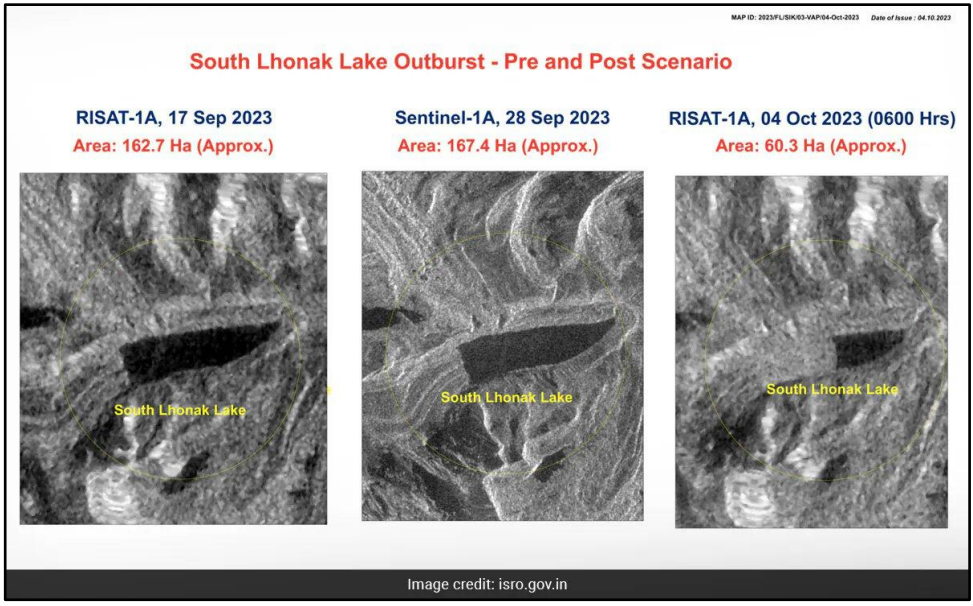
Teesta Disaster: A Human-made Disaster and the Lessons Learnt

The author, a specialist in disaster management in North East India, writes that Sikkim should now concentrate on the efficient handling of the already constructed and commissioned hydropower projects instead of venturing into new ones. There should be proper human coordination and Early Warning System in place to manage the functional dams. The inefficiency and lack of human coordination to handle current flash floods in the upper Teesta catchment has badly exposed Sikkim. A small mistake upstream will have a tremendous human and environmental impact downstream. Sikkim needs to evolve comprehensive regional hydropower policy in view of its unique regional environment, ecological setup, and geography.

The Upper Teesta catchment areas of Sikkim and Darjeeling Himalaya were ravaged by a Glacial Lake Outburst Flood (GLOF) on the night of October 3 and 4, 2023 (reportedly between 10:30 p.m. and 3:00 a.m., respectively). The exact timeline of the flood from its source to

Sevoke in West Bengal is yet to be correctly established. The hazard quickly turned into disaster, destroying human and animal lives, including human-made infrastructure downstream.

The Lhonak Lake that burst out of its dam on October 3, 2023 is one among many potentially dangerous glacial lakes in the Sikkim Himalaya. The rapidly warming Himalaya has led to an acceleration of various geomorphic processes, including melting of glaciers. The rapid melting of glaciers has further given rise to many potentially dangerous glacial lakes, in recent times. It has increased the intensity and frequency of extreme climatic events like the GLOF in the Himalaya. While GLOFs are not a new phenomenon across the Himalaya, their occurrence has become more frequent and intense in the past couple of decades.



Note: RISAT-1A is a radar imaging satellite of the Indian Space Research Organisation, and Sentinel-1A is a European radar imaging satellite.

In view of the inherent vulnerability of the Himalaya to various environmental, geomorphic and geologic process, scientists, researchers, and activists have been warning about the unplanned and haphazard hydro development in the Sikkim-Darjeeling hills for over two decades. The governments, both central and state, and development proponents, however, dismissed the concerns communicated through scientific reports, papers and other means as fear mongering. Consequently, the Sikkim and Darjeeling catchment of the Teesta basin were dotted with many mega hydropower projects during much of the 2000s and 2010s. In fact, Sikkim today has one of the highest densities of hydropower projects in India.

The Lhonak Lake outburst flood carrying reportedly over 15 million cubic meters of water swept through the steep valley of north Sikkim, bringing down silt, debris, and boulders and hit the Teesta-III hydro dam located at Chungthang. Also known as Teesta Urja, the project was the largest in Sikkim with 1200 MW capacity and located at the highest elevation of over 1,700 meters above sea level. The flood water reportedly hit the dam between 11:30 p.m. to 12:30 a.m. (on October 3 to 4).

With the reservoir capacity of 5.08 million cubic metres, the dam already had water in its reservoir. Unfortunately, the gates of the dam could not be opened for floodwater to pass through as, reportedly, the dam authorities did not receive information on time. When the flash flood hit the dam, it could not withstand the force and eventually collapsed. The flood hazard, therefore, turned into a massive human-made disaster downstream of Chungthang, killing close to 100 people, displacing thousands, and affecting over 100,000 of the population. The impact of the flood would have been milder had the gates been opened on time. Furthermore, if there was no dam to obstruct the GLOF, the hazard

may not perhaps have turned into disaster. The new infrastructure like dams acts as barriers, whereas earlier the pathway for the floods to go through the valley was clear. Apart from the series of dams, people have also settled along the riverbeds, further obstructing the flow of water. It is also important to understand that the Sikkim-Darjeeling Himalaya, being a backward and under-researched region, did not have such long-term data on the table when dams were planned and designed in the early 2000s. That is the reason why anti-dam activists often question the technical, environmental, and human procedures followed by the proponents of hydropower dams in the Himalayan region, including in Sikkim.

Notably, the Teesta-V dam, located about 40 kilometres downstream of Chungthang, withstood the flash flood as its spillover gates could be opened, although, reportedly, partially. However, there are reports that dam to dam communication was not established on time which led to massive damage of the dam and its offices. It is difficult to visualize what would have happened to the population downstream if the Teesta-V had not withstood the Teesta flood and broken down, instead. The combined water of two dams and the GLOF would have destroyed two more dams downstream (TDLP-III and IV) in the Darjeeling hills (under the Gorkhaland Territorial Administration) of West Bengal, inflicting incalculable human tragedy and giving us one of the biggest human disasters in the history of the Eastern Himalaya.

In the event of collapse of a series of hydro-dams, the Teesta flood would have taken with it most of the human settlements downstream of Dikchu. It would have pushed Sevoke forest, a small stretch that separates the Teesta and Mahananda Rivers, and joined Mahananda, washing away a major part of Siliguri city with a population of close to 1.5 million. Historically, the Teesta joined the Mahananda

river instead of the Brahmaputra. It was only around the year 1787 that the Teesta changed its course and became a tributary of the Brahmaputra. The geomorphic history of the Teesta is complex and this human failure in its upper catchment invites a detailed investigation.

There is now a common voice in the region—no more dams. The popular voice is further strengthened by the statement of Karma Loday Bhutia, Forest and Environment Minister, government of Sikkim, opposing dam construction in Chungthang following the Teesta disaster. Sikkim should now concentrate on the efficient handling of the already constructed and commissioned hydropower projects instead of venturing into new ones. There should be proper human coordination and Early Warning System in place to manage its functional dams. The inefficiency and lack of human coordination to handle current flashfloods in the upper Teesta catchment has badly exposed Sikkim. A small mistake upstream will have a tremendous human and environmental impact downstream as it is a common river basin that we share in the Darjeeling hills, North Bengal plains, and a part of northwest Bangladesh.

The state of Sikkim needs to evolve a comprehensive regional hydropower policy in view of its unique regional environment, ecological setup, and geography. It needs to have a sound hydropower policy, adequately taking into account the region's geological and geomorphic specificities. Mainstreaming of Disaster Risk Reduction (DRR) and Climate Change (CC) with hydropower policy needs to be prioritized. Contingency plans for disaster management need to be drawn up for such events covering all existing hydro-projects in the area. Further, the mainstreaming of Environmental Management Plan, DRR, and CC in the development processes and projects, particularly in sensitive sectors like hydropower projects, is indispensable for the sustainable development

of the region. The ingress of politics and economics into dams without adequate precautionary measures will only take us to disaster. The stakeholders have been talking about an early warning system as one of the most important instruments of DRR, which the Sendai Framework (2015-30) also emphasizes. However, we do not have these systems in many critical hazard-prone areas of Potentially Dangerous Glacial Lakes. Failure to install an early warning system on time was one of the reasons why the South Lhonak Lake outburst turned into a disaster.

Rebuilding is a difficult task but not impossible. We need to have clear short-, medium-, and long-term plans for sustainable reconstruction and rehabilitation. This demands a multidisciplinary approach involving affected people, practitioners, social scientists, policy planners, physical scientists, elected representatives, civil societies, and medical and psychological professionals. The promoters of all big development projects talk about participatory planning on paper. However, they do not involve people and their concerns/interests when these projects are actually planned and implemented. This leads to conflict in the long run and makes the project unsustainable both socio-economically and environmentally. We need decentralized and participatory planning of development projects in the true sense.

In the meantime, the Teesta's message to fellow humans is, "Sorry folks, I had to do this. I was forced to reclaim my lost spaces. I wasn't after you and your assets. I was only clearing my way, so badly encroached by you, for my smooth flow. That was what I did in 1968 and decades before, and will do so again in future if you do not stay clear of my path. I have calmed down, for now. Hopefully, you will respect my space and path from here onwards. I just need your respect. I shall reassess my space after few decades. Till then, stay safe."

Chungthang Town and Teesta-III Dam Reservoir area: Before and After the GLOF Event

Source: Picture: via @planet labs, X (accessed and compiled on 15.10.23).

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