

ESSAY



The Himalayan Disasters – time to rethink development models

-- *Venkatesh Dutta*

The Indo-Tibetan Border Police came on alert after a glacier erupted in Sumana in the Niti Valley near the Indo-China border near Joshimath in Uttarakhand on 24th April 2021. The Army released the first visuals of the rescue operation in Uttarakhand after the glacier was hit by an avalanche. In the visuals, an army helicopter is seen landing on a helipad surrounded by snowy mountains. A man is pulled out from under the snow by a group of soldiers, after which they escort him to safety. In all, eight bodies were recovered and 384 people were rescued by the army.

Earlier this year, on the morning of February 7 this year, a huge glacier erupted in the same area causing loss of life, severe floods and massive destruction in Chamoli. At least 71 people died in this disaster and 130 or more people have not been traced till date. Villagers near the river were also washed away and many workers were trapped in tunnels for hydroelectric projects at the disaster site. This terrible disaster reminded of the 2013 Kedarnath tragedy. A major chunk of the glacier in the Nanda Devi catchment fell into the Dhauliganga River near Reni village in the Chamoli district of Uttarakhand. The Dhauliganga River flows up to Vishnuprayag, where the Dhauliganga and Alaknanda rivers meet. Due to sudden release of rock and ice, the water level in the tributaries also rose significantly. The force of the river was so high that it washed away the 13.2 MW Rishiganga Hydroelectric Project near Joshimath and also caused significant damage to the 520 MW Tapovan-Vishnugarh Hydroelectric Project. Recent, high-resolution images obtained by satellites indicate that rock and ice movement and avalanche follow-up activities are continuing in the region.

Such disasters are caused by the bursting of glacial lakes. This is called a glacial lake outburst flood or GLOF. Unlike normal lakes, glacier lakes are made up of loose rocks and debris. They are highly unstable because they are often surrounded by snow or glaciers. Large glacial lakes tend to accumulate water, and large-scale meltwater can cause catastrophic flooding in low-lying areas through accidental boundaries. Such floods have been responsible for thousands of deaths over the past century as well as the destruction of villages, infrastructure and livestock.

Himalayan glaciers are retreating rapidly. This is most notable since the 1990s. In January 2020, the United Nations Development Program (UNDP) estimated that more than 3,000 glacial lakes have formed in the Hindu Kush Himalayan region, with 33 posing an imminent threat that could affect seven million people. Uttarakhand has 1,474 glaciers of more than 10 square kilometres, covering an area of 2,148 square kilometres

The mass of these glaciers is decreasing rapidly. Satellite images show that eight glaciers of the upper Rishi Ganga catchment – North Nanda Devi, Changbang, Ramani Bank, Bethertoli, Trishul, South Nanda Devi, Southern Rishi Bank and Ronthi Bank – are melting on a large scale and for the past three decades. In a short time, about 15 percent has come down. There has been a steady rise in temperature in Uttarakhand in the last four decades. The intensity of flash floods has also increased. Small glaciers are melting rapidly due to global warming, leading to the formation of hanging glaciers in many places. All of these have developed cracks due to rising temperatures. It is reported that months before the landslide, a large crack had developed under Ronti Peak.

As the temperature in the hills of Chamoli district of Uttarakhand dipped below zero in the month of February, why did the glaciers break now? This is an anomaly. In winter, glaciers remain firmly frozen. Even the walls of glacial lakes remain tightly bound. Such floods in this season are usually caused by avalanches or landslides. Similar disasters may happen more frequently in the future. Out of about 1500 glaciers across the Himalayas, only 35 are being monitored properly. Over the past few decades, thousands of glacial lakes have formed in different parts of the Himalayas, which are capable of suddenly releasing large amounts of water. These will cause serious damage if they burst. The United Nations Intergovernmental Panel on Climate Change (IPCC) said global warming has made rainfall and snowfall more uneven -

especially for South Asian countries that are now experiencing more frequent and deadly heat waves.

The Chamoli disaster is clearly an indication of the adverse impact of climate change and unplanned development on the Himalayas. Two things are clear: Climate change has played a disastrous role and we must now reconsider hydroelectric projects in sensitive areas like the Himalayas. Given the damage to the two hydroelectric projects, hydroelectric projects in the sensitive ecology of the Himalayas should be viewed with caution. Reducing the risk of climate change and water flow variability is one of the most important issues for future energy security, which requires a better understanding of future climate projections. This understanding is essential to consider in the design and location of future hydroelectric projects in the sensitive Himalayan eco-region.

The villagers flagged the Rishiganga power project as an imminent calamity and also filed a PIL in the Uttarakhand High Court alleging that several private firms were using explosives in violation of environmental norms and were involved in mining activities. No major dams should have been built on the Alaknanda, Bhagirathi and Mandakini rivers as the region has very steep slopes and is a very sensitive ecological region. However, large scale construction is still going on, due to which there may be major disasters in future.

It was a man-made disaster. Ironically, Raini village, where the disaster happened, is the cradle of the Chipko movement, which was started by villagers in Uttarakhand in the 1970s to save trees. Joshimath and other nearby cities have become popular tourist destinations with thousands of hotels and winter resorts. Concrete hydropower, dams, tunnels and highways are being built by continuous blasting bypassing the sensitive ecology of the region. There are more than 80 small and big hydroelectric power plants in Uttarakhand. Uttarakhand has lost more than 50,000 hectares of forest in the last 20 years. Chamoli is one of the most affected areas, where about 4000 hectares of forest have been destroyed by mining, road construction and power-distribution lines. Land use has changed with massive deforestation and landslides.

Studies are done in our laboratories, many reports are prepared, but no action is taken on the ground. Uttarakhand has recently prepared a flood zoning map, enacted a law to control floodplains, drafted 'Disaster Risk Assessment' and 'State Disaster Management Plan'; Prepared a 'District Disaster Management Action Plan' for Joshimath and Badrinath, a 'Risk Reduction Strategic Plan' for Chamoli and a 'Uttarakhand Risk Database' of maps and documents for risk-reduction activities and plans in the state. Now it is necessary to take all these plans on the ground.

We have to rethink development models, especially with regard to harnessing the hydroelectric potential of the geographically fragile and sensitive Himalayas. The Himalayas are an earthquake-prone region. Even a low-order earthquake can trigger a severe disaster in many parts of the region. Nearly a quarter of the 273 Himalayan hydroelectric projects in India, Nepal and Bhutan are likely to be severely damaged by earthquakes and landslides. The sensitive ecosystem of the Himalayas has to be saved from the rampant development of road widening and hydroelectric projects. Non-compliance with environmental regulations can cause large-scale damage, which can end the lives of millions of people in the blink of an eye.

Student Q&A

What is the polar vortex? will it affect the winter chill in India?

(Amogh Anant, Class V, Manipal Public School, Lucknow)

Ans: The polar vortex is a large area of low pressure and cold air surrounding both of the earth's poles. It always exists near poles, but weakens in summer. The term 'vortex' refers to the counter-clockwise flow of air that helps keep the colder air near the Poles. Many times during winter in the northern hemisphere, the polar vortex will expand, sending cold air southward with the jet stream. This occurs fairly regularly during wintertime and is often associated with large outbreaks of Arctic air in the United States. This is not confined to the United States. Portions of Europe and Asia also experience cold surges connected to the polar vortex. The unusually cold weather in the hill states of north India and part of the plains have been indirectly caused by the polar vortex that spins over the north pole.

----- Sandeep Hamilton