

Before Himalayan Flood, India Ignored Warnings of Development Risks

Long before a deadly flood hit two hydroelectric dams, scientists warned repeatedly that such projects were dangerous in a fragile region made more so by global warming.



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NEW DELHI — Long before the floods came, washing away hundreds of people and wiping out newly constructed dams and bridges, the warning signs were clear.

The Himalayas have been warming at an alarming rate for years, melting ice long trapped in glaciers, soil and rocks, elevating the risk of devastating floods and landslides, scientists warned. Nearby populations were vulnerable, they said, and the region's ecosystem had become too fragile for large development projects.

But the Indian government overrode the objections of experts and the protests of local residents to blast rocks and build hydroelectric power projects in volatile areas like the one in the northern state of Uttarakhand, where disaster struck.

Officials said Monday that bodies of 26 victims had been recovered while the search proceeded for nearly 200 missing people. On Sunday a surge of water and debris went roaring down the steep mountain valleys of the Rishiganga river, erasing everything in its path. Most of the victims were workers on the power projects.

Villagers said the authorities overseeing the expensive development projects had not prepared them for what was to come, giving a false sense of confidence that nothing was going to happen.

"There was no program or training in the village about disaster management by the government," said Bhawan Singh Rana, head of the Raini village, hit by some of the worst damage. "Our village is on a rock, and we fear that it may slide anytime."

Security forces focused on one tunnel where they said 30 people were trapped. Food was airdropped to about 13 villages where the roads have been cut off, with roughly 2,500 people trapped.



India's army and rescue teams worked to uncover a tunnel blocked with mud and debris from the flood. Sajjad Hussain/Agence France-Presse — Getty Images

The devastation of the Uttarakhand floods has once again focused attention on the fragile ecosystem of the Himalayas, where millions of people are feeling the impact of global warming. The World Bank has warned that climate change could sharply diminish living conditions for up to 800 million people in South Asia. But the effects are already felt, often in deadly ways, in large parts of the Himalayan belt from Bhutan to Afghanistan.

The region has about 15,000 glaciers, which are retreating at a rate of 100 to 200 feet per decade. The melting feeds or creates thousands of glacial lakes that can suddenly break through the ice and rocky debris holding them back, causing catastrophic floods. In Nepal, Bhutan, India and Pakistan, a large number of glacial lakes have been deemed imminently dangerous by The International Centre for Integrated Mountain Development, an intergovernmental group.

Nepal has been particularly vulnerable, with climate change forcing entire villages to migrate to lower lands for survival from a deepening water crisis. Deadly flash floods, some caused by glacial lakes bursting, have also become more frequent.

Scientists have warned repeatedly that development projects in the region are a deadly gamble, potentially making matters worse.

Ravi Chopra, the director of People's Science Institute in Uttarakhand, said a 2012 expert group appointed by the government had recommended that dams should not be built in the Alaknanda-Bhagirathi basin, including on the Rishiganga. He was part of a scientific committee appointed by India's highest court in 2014 that also advised against building dams in "the para-glacial zone," what he described as an area where the valley floor is more than about 7,000 feet above sea level.



The Khumbu Glacier in Nepal. The flood was believed to be triggered by a break on a Himalayan glacier, one of 15,000 glaciers in the region which are retreating at a rate of 100 to 200 feet per decade. Tashi Sherpa/Associated Press

"But the government has gone ahead and chosen to build them," he said. Both of the hydroelectric projects hit by Sunday's flood — one obliterated and the other badly damaged — were built in that zone, he said.

D.P. Dobhal, a former scientist at the government-run Wadia Institute of Himalayan Geology, said, "When we develop such projects in the Himalayas such as hydro projects or roads and rail, in detailed project reports the glacier study data is never taken into consideration or included."

The government is building more than 500 miles of highway in Uttarkhand to improve access to several major Hindu temples, despite environmentalists' objections to the massive forest clearance required, which can hasten erosion and raise the risk of landslides.

A scientific committee appointed by India's Supreme Court and led by Dr. Chopra concluded last year that the government, in building the highway to the width of 10 meters, about 33 feet, had gone against the advice of its own experts at the Transport Ministry. The government had argued a wider road brought more economic dividends and was needed for potential deployment of large-scale military equipment to the disputed border with China.

The Supreme Court sided with one faction of the scientific committee and ruled that the road should be limited to 5.5 meters, or about 18 feet. But by that time, hundreds of acres of forest and tens of thousands of trees had already been cut, a report in the Indian news outlet The Scroll said.

"When you have your own ministry experts telling you the Himalayan region roads should not have a tarred surface of more than 5.5 meters, and then to go against your own experts' recommendations, then that is a serious matter," Dr. Chopra said. "Unless the courts look into the issue of the sanctioning officials and the executing officials personally accountable, I don't think the situation will change."



Rescuers recovering a body after the flood disaster on Sunday. Nearly 200 people remained missing on Monday. Rajat Gupta/EPA, via Shutterstock

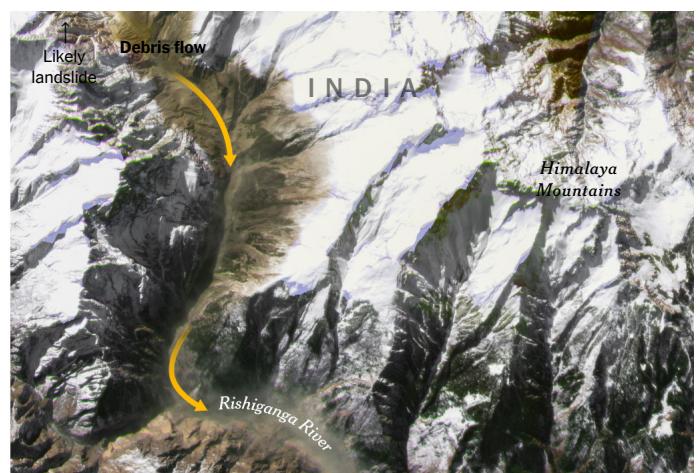
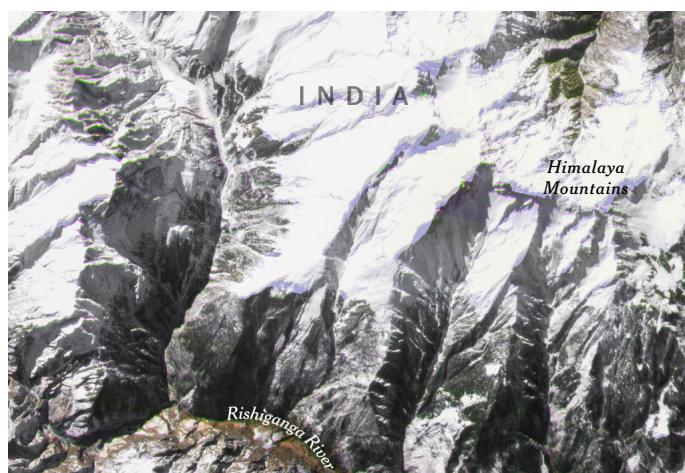
Trivendra Singh Rawat, the chief minister of Uttarakhand, warned against seeing the flooding as “a reason to build anti-development narrative.”

“I reiterate our government’s commitment to develop hills of Uttarakhand in a sustainable manner, and we will leave no stone unturned in ensuring the achievement of this goal,” Mr. Rawat said on Twitter.

Exactly what caused the latest flooding was not clear as of Monday night, with the Indian government saying a team of experts would visit the site to investigate. Ranjeet Rath, the head of India’s geological survey, said initial information suggested a “glacial calving at highest altitude.” Calving is the breaking of ice chunks from a glacier’s edge.

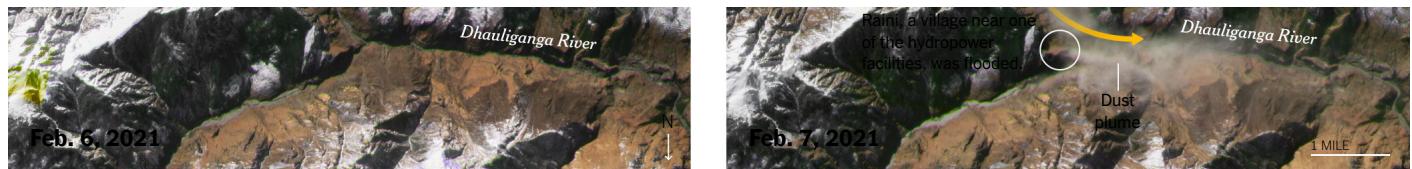
Scientists studying satellite imagery from before and after the flooding said it was likely not caused by a glacial lake bursting, as no such lake was visible in the images.

Before and After the Uttarakhand Disaster



2/9/2021

Before Uttarakhand Flood, India Ignored Warnings - The New York Times



Source: Planet Labs Inc. • By Veronica Penney/The New York Times

They said the disaster most likely began with the collapse of a rock slope that had become unstable from thawing of ice in recent summers, and such a landslide could have broken up part of a glacier.

An avalanche could have dammed the river temporarily, creating a lake which then broke free, said Umesh K. Haritashya, a scientist who studies glacial hazards at the University of Dayton in Ohio.

Avalanches also generate heat from friction, which can melt ice that lies in its path or is in the tumbling debris.

"Basically it's a landslide that is some fraction rock, and some fraction ice," said Dan Shugar, a geomorphologist at the University of Calgary in Alberta. "A lot of the ice melted. And it might have picked up a lot more."

The Raini village was in one of the areas hit hardest on Sunday, where the 13-megawatt Rishiganga hydro power project was completely washed away. Afterward, roughly 100 of the village's 150 residents spent the night in the open.



Residents in the flood-stricken area peering at the damage. Rajat Gupta/EPA, via Shutterstock

"We did not sleep in our houses out of fear that more water may come, rocks may shift, something more dangerous may happen," said Mr. Rana, the village head. "We took our bedding up in the forest, lit some fires, and somehow passed the night."

The area was the site of a well-known environmental protest against deforestation in the 1970s. Protesters, a large number of them women, would hug trees to stop loggers from cutting them, in a movement that became known as "chipko," or embrace.

Mr. Rana said local residents also held protests against construction of the Rishiganga power project, which began generating electricity last year, and they even filed court cases, but to no avail. They feared that the blasting of rocks would cause deadly landslides.

“We used to hear blasting and see the rocks shift,” he said. “When this project was under construction, half of our village slid. We requested to be shifted from here to another place. The government said they would do it, but it never happened.”

Bhadra Sharma contributed reporting from Kathmandu, Nepal, and Henry Fountain from Albuquerque.