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HAZARDOUS IDEAS FOR THE HIMALAYAS

Relevant for: Geography | Topic: Mountains, changes therein and in Flora & Fauna and the Effects of such changes

An aerial view of Nepal's earthquake-hit Barpak area on May 3, 2015. | Photo Credit: PTI

In an article published on the website of the Central Committee of the Communist Youth League, China announced that it is planning to build a major hydropower project as a part of its 14th Five-Year Plan (2021-25), on the Yarlung Zangbo River, in Mêdog County in Tibet. The hydropower generation station is expected to provide 300 billion kWh of electricity annually. The Chinese authorities say the project will help the country realise its goal of reaching a carbon emission peak before 2030 and carbon neutrality before 2060.

As speculation about this news began floating around in Mêdog County, not far from Arunachal Pradesh, Indian counterparts were quick to reiterate their plans to dam the Himalayas on this side of the border. India is reportedly considering a 10-GW hydropower project in an eastern State.

Also read | 'Carefully monitoring' Brahmaputra amid China dam plans, says India

In this mad rush of one-upmanship, both countries ignore how unviable such 'super' dams projects are, given that they are being planned in an area that is geologically unstable. It is high time that India and China sat together to deliberate on the consequences of such misadventures in an area where massive earthquakes are bound to take place.

Over the past 20 years, both China and India have been competing with each other to build hydroelectric dams in this ecologically fragile and seismically vulnerable area. There are two hydropower projects in the works in Arunachal Pradesh on the tributaries of the Brahmaputra: the 600 MW Kameng project on the Bichom and Tenga Rivers and the 2,000 MW Subansiri Lower Hydroelectricity Project. On the other side of the border, China has already completed 11 out of 55 projects that are planned for the Tibetan region. In executing these hydroelectric projects at a maddening pace, the two countries overestimate their economic potential and grossly underestimate the earthquake vulnerability of the region.

Consider this: High seismic zones coincide with areas of high population concentration in the Himalayan region where landslides and glacial lake outburst floods are common. About 15% of the great earthquakes of the 20th century (with a magnitude of more than 8) occurred in the Himalayan region. The northeast Himalayan bend has experienced several large earthquakes of magnitude 7 and above in the last 100 years, more than the share from other parts of the Himalayas.

Also read | Mega dam plan leads to fury at Assam border

The 1950 earthquake just south of the McMahon Line was of 8.6 magnitude. It was the largest continental event ever recorded, and devastated Tibet and Assam. The earthquake killed thousands, and caused extensive landslides, widespread land level changes and gaping fissures. It resulted in water and mud oozing in the Himalayan ranges and the upper Assam valley. This dammed the rivers. Later the dams were breached generating flash floods in the downstream sides, seriously silting the drainage systems. The earthquake was felt over an extensive area comprising parts of India, Tibet, erstwhile East Pakistan and Myanmar. This event gives us grim pointers of what we can expect in the north-eastern bend of the Himalayas if

a similar event was to take place in the background of the fast-developing hydro projects.

To take a more recent example, the 2015 Gorkha earthquake of magnitude 7.8 in central Nepal resulted in huge losses in the hydropower sector. Nepal lost about 20% of its hydropower capacity consequent to the earthquake. About 30 projects with a capacity of 270 MW, mostly located along the steep river valleys, were damaged. The cost of physical damage is calculated to be about $200 million. The study published in a 2018 paper in *Geophysical Research Letters,* by Wolfgang Schwanghart and others, for example, is quite revelatory on the earthquake-borne damage sustained by hydropower projects in Nepal. The main mechanisms that contributed to the vulnerability of hydropower projects were found to be landslides, which depend on the intensity of seismic ground shaking and slope gradients.

Heavy siltation from giant landslides expected in the project sites and headwater region from future earthquakes will severely reduce the water-holding capacity and life expectancy of such dams. Even without earthquakes, the steep slopes made of soft rocks are bound to slide due to deforestation and road-building. These activities will get intensified as part of the dam-building initiatives. Desilting of dams is not an economically viable proposition and is technologically challenging. From these perspectives, the northeast Himalayan bend with its deep gorges is the most unsuitable locale within the Himalayas for giant dams. Also, we do not know how reservoirs with their water load would alter the existing stresses and strains on the earth's crust in the long term, impacting the frequency of earthquakes and their mechanisms.

Also read | Previously unknown faults at the foot of the Himalaya discovered

The Himalayan range is a transnational mountain chain and is the chief driver of the Asian climate. It is a source for numerous Asian river systems and glaciers which are now under the threat of degradation and retreat due to global warming; these river systems provide water for billions of people. This legacy of humanity has now become highly contentious with territorial disputes between two nuclear powers — India and China. The ongoing low-level military confrontations between these two countries have led to demands for further infrastructural development on both sides, including all-weather roads, much to the peril of regional biodiversity and the livelihoods of the indigenous population.

In a recent article in *Nature*, Maharaj K. Pandit, a Himalayan ecologist, says in recent years, the Himalayas have seen the highest rate of deforestation and land use changes. He suggests that the upper Himalayas should be converted into a nature reserve by an international agreement. He also says the possibility of a Himalayan River Commission involving all the headwater and downstream countries needs to be explored.

Rather than engaging in unsustainable dam-building activities, India and China, the major players in the region, would be well advised to disengage from military adventurism and seek ways of transforming this 'roof of the world' into a natural reserve for the sake of humanity. Carbon neutrality should not be at the expense of the environment.

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To reassure Indian Muslims, the PM needs to state that the govt. will not conduct an exercise like NRC

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