Inducing Vulnerabilities in a Fragile Landscape

KANCHI KOHLI

In Sikkim at least 17 large hydropower projects on the Teesta River and its tributaries have their environmental clearances in place, despite warnings, improper assessments and negotiated conditions. At a point of time when a natural seismic occurrence has shaken the stability of an already unpredictable Himalayan ecosystem, it is important to revisit the concept of hydropower projects as a green, clean and safe option.

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Kanchi Kohli (*kanchikohli@gmail.com*) works and writes on social and environmental issues and is a member of Kalpavriksh Environmental Action Group, New Delhi.

In early November 2011, the people of Chungthang and Shipgyer gram panchayats of Lepcha Reserve of Dzongu, Sikkim, wrote to the managing director of Teesta Urja seeking compensation for the damage experienced by people in the project-affected area during the earthquake of 18 September. The letter articulates their conviction that the houses already damaged due to the blasting and other related construction activities of the Teesta III hydroelectric project being executed by Teesta Urja, could not withstand the impact of the earthquake. While most of the houses collapsed, others were severely damaged, said the letter.

When the earthquake of the magnitude of 6.9 on the Richter scale hit north-eastern India, Sikkim felt both the quake and its aftershocks with the maximum intensity. Even as the extent of the damage is still being estimated, the earthquake and its aftermath has thrown up many reflections and lessons around hydropower generation.

The Teesta III hydroelectric project is being constructed on the River Teesta, which is considered Sikkim's lifeline. The river originates from Tso Lhamo lake in the eastern part of the state and then flows towards West Bengal. As it traverses through its basin, the river is fed by several tributaries and rivulets until it forms the ecological border between the two states and finally joins the Brahmaputra in Bangladesh. For Sikkim and its people, the flow of the Teesta has always had a deep-rooted connection with their lives, livelihoods and cultures. A change in this river ecosystem affects all these aspects. However, in the last decade, Sikkim, which is known for its stunning forest vistas and amazing biodiversity, has been under threat from the cumulative impacts of close to 30 large hydroelectric projects to be constructed on the Teesta and its rivulets. While several of these are already under construction or completed, many more are at various stages of approval.

Run-of-the-River Projects

Hydropower projects in Sikkim like the Teesta III are projected as environmentally benign because unlike storage reservoirs they do not cause huge submergence or large-scale displacement of the population. But most of Sikkim's so-called "run-of-the-river" hydroelectric projects being developed divert the river waters through long tunnels before the water is dropped back into the river at a downstream location after passing through a powerhouse.

The perception that they are "environmentally benign" ignores the impact of several features intrinsic to this design. For example, long stretches of the river

will be bypassed between the dam and powerhouse, with up to 85-90% of the flow in the winter (lean season) diverted through the tunnels. In the already commissioned 510 MW Teesta V project in Sikkim, the "head race tunnel" taking the water from the dam to the powerhouse is 18.5 km long and bypasses a 23 km length of the river. The cascade of proposed projects will mean most of the river will essentially end up flowing through tunnels.

These projects also involve extensive tunnelling in a geologically fragile landscape, the environmental and social impacts of which are most often underestimated. Impacts observed include cracks in houses above long tunnel alignments, drying up of water resources and major landslides. In projects that are underway on the Teesta, the list of project-affected-persons is clearly much longer than what is calculated at the planning stage which only looks at those whose lands are to be directly acquired for the project. The tunnelling also generates a huge quantity of debris. The indiscriminate dumping of massive quantities of excavated debris in steep eastern Himalayan valleys with little available flat land is a gross environmental violation (Lepcha and Vagholikar 2011).

Induced Vulnerabilities

The troubled terrain of hydropower projects in Sikkim is not new. However, it becomes even more relevant today in the damaged imagery of the earthquake. The questions around the state's vulnerability to seismic events like the earthquake and the impacts of landslides having been aggravated by the construction of a large number of hydropower projects cannot be brushed aside. While it might not be possible to ascertain that the earthquake itself was induced by heavy construction in an ecologically volatile mountain region, there are several important points to address about what kind of interference of existing land use increases risk and pressures.

The letter by the residents of Chungthang brings the issue of induced vulnerability to light through evidence. It refers to a report of the department of mines and geology prepared following an investigation in April 2010 in response to the request of the people affected by the construction of the Teesta III project. The report titled, "Report on Damages Caused Due to Blasting and Other Activities by Teesta III HEPP Under Construction by M/s Teesta Urja" compares the situation to a pre-dam scenario when the area was free from major instabilities except bank erosion. While referring to the situation in townships such as Jorethang, Singtam and Rangpo, the report states that, even though these are situated over similar geological conditions as Chungthang, they have not experienced any distress in reinforced cement concrete (RCC) structures. It reiterates that the cause of damage to RCC structures in Chungthang is mainly due to blasting in close vicinity.

State authorities, including Chief Minister Pawan Chamling, have sought to underplay the connection. As reported, the state's resilience has been compared to countries like Canada and Switzerland where dams dot the landscape and have been declared safe. Those who raise these questions are irresponsible, the chief minister has been quoted to have said (Gurung 2011).

The chief minister's statements stand in contrast to the observations of the Comptroller and Auditor General (CAG) of India in its 2009 report on Sikkim. The CAG report states that the land profile of the state consists of steep slopes and narrow gorges and is prone to weathering, erosion and frequent landslides. Further, it is also located in Zone IV according to seismic zoning map of India. It adds that during the last 50 years, as many as 115 cases of major landslides and nine major earthquakes of magnitude of more than 5 on the Richter scale were recorded. Keeping this in mind, the CAG report cautions that

> the establishment of the hydropower projects in the State entailed extensive excavation, tunnelling, blasting, construction of mammoth water reservoirs, powerhouses and allied activities. These construction activities put tremendous stress on the fragile environment of the State which could bring about unanticipated disasters and calamities (CAG 2009).

The Story of Regulatory Collapse

Leaving aside the current situation, the story of the Teesta's tryst with environment regulation can be traced back to 1998 when the expert committee for river valley and hydroelectric projects in the Ministry of Environment and Forests (MOEF) was in the process of granting approval to the 510 MW Teesta V hydro project of the NHPC. This approval was required as part of the procedure prescribed under the environment impact assessment (EIA) notification, 1994 (subsequently amended in 2006). This project was to be the first of the six-stage "cascade" plan to harness 3,635 megawatt of hydropower, all within 175 km of the river Teesta in Sikkim (Menon and Vagholikar 2004).

Initially, MOEF's committee was of the view that the Teesta V project should not be

allowed to go ahead unless and until a comprehensive carrying capacity of the river Teesta was carried out. The purpose of such a study would be to ascertain the extent of load the river Teesta can actually take when it comes to social, ecological and environmental impacts. But in 1999, Teesta v project was granted clearance with a condition that no other project in Sikkim would be considered for environmental clearance till the carrying capacity study was completed.

Even as the New Delhi-based Centre for Inter-Disciplinary Studies of Mountain and Hill Environment (CISMHE) continued to carry out the carrying capacity study in the area, the 1,200 MW Teesta III project (another run-of-the-river scheme) was granted environmental clearance. It was one amongst the five projects on the Teesta river basin which was approved in violation of the conditions prescribed for Teesta V. CISMHE's study was funded by the NHPC and it took six years to complete (2001-07).

In October 2008, based on the CISMHE recommendations, the MOEF issued a letter to the Government of Sikkim that no activities related to dams (even investigations) should be taken up north of Chungthang region in north Sikkim, home to the Lepcha, Bhutia and other communities. The MOEF asked the state government to scrap five projects – Teesta I (300 MW), Teesta II (480 MW), Bhimkyong (99 MW), Bop (99 MW) and Lachung (99 MW) hydro-electric power stations (HEPS), with a total installed capacity of 1,077 MW. It is pertinent to note that this was the time that the movement against dams in Sikkim led by the Affected Citizens of Teesta (ACT) was at its peak. As part of this struggle, several local youth took the campaign to the streets of Gangtok and launched an indefinite satyagraha as a mark of protest and to bring pressure on both central and state governments.

In January 2010, the power secretary of the Government of Sikkim attended the Expert Appraisal Committee (EAC) meeting which was revisiting the above-mentioned projects. P G Sastry, an erstwhile EAC chairperson, who now represents Sikkim's department of power, argued that the project developers were unable to carry out exploratory work upstream of Teesta to gather additional data for mitigation and management of impacts because of the MOEF's decision. In February 2010, the EAC gave permission to Teesta I and II projects to conduct these investigations.

In March 2010, after members of the EAC visited Sikkim, the remaining three projects in north Sikkim, Lachung, Bhimkyong and Bop HEPS were allowed to carry out investigations. In the judgment of the EAC subgroup that visited the sites of these projects, the sites at Bop and Bhimkyong do not have any rehabilitation issues and the 10 km stretch of the tunnelled river is intercepted by several perennial streams. Based on their wisdom, the MOEF took a decision to allow Lachung, Bhimkyong and Bop projects to initiate EIAS which would then set the ball rolling for procuring the environment clearance under the EIA notification, 2006 (Kohli 2011).

As on date, at least 17 large hydropower projects on the Teesta and its tributaries have their environmental clearances in place, despite warnings, improper assessments and negotiated conditions. The violations made by the existing projects are still unaddressed. In June 2011, Tseten Lepcha, the honorary wildlife warden of the north district of Sikkim wrote to the MOEF highlighting the violations of the Wildlife Protection Act, 1972 in the killing of a Serow (*Capricornis sumanntraensis*), a Schedule I animal, by a subcontractor at the Teesta III project site in 2008, and the lack of appropriate action. In the same letter, he highlighted that the Teesta III project is being constructed without all the prescribed approvals. The letter states that the project also requires a clearance from the standing committee of the National Board for Wildlife (NBWL) as it is just 1 km away from the Khangchendzonga National Park (some of the components are within the Khangchendzonga Biosphere Reserve). This violates the Supreme Court order of December 2006 that laid down that projects within 10 km radius of national parks and sanctuaries must be referred to the Standing Committee of the NBWL. This was never applied for Teesta III.

The People's Struggle

The story of dams in Sikkim would be incomplete without mentioning and acknowledging the consistent struggle of the affected people and their supporters in Sikkim, north Bengal and in New Delhi. The members of the ACT have taken to the streets of Gangtok even as negotiations between the Sikkim government and MOEF were on. Representatives of the Lepcha tribal community who would be affected by the construction of the dams on the river Teesta and other tributaries began an indefinite hunger strike to save Dzongu, their traditional homeland. It was one of the most inspiring youth-led campaigns of recent times which received

both national and international attention. While the impact on Lepcha culture and identity was important, the campaign was deeply concerned about the impact on the Teesta's river ecology and flow. ACT aptly has described their anguish by saying,

> "Our sacred Teesta is being converted into an underground river." A concern many people in the state continue to carry forward, till date. (More at http://weepingsikkim.blogspot.com/ and http://www.actsikkim.com/)

At a point of time when a natural seismic occurrence has shaken the stability of an already unpredictable Himalayan ecosystem, it is important to revisit the concept of hydropower projects as a green, clean and safe option. Perhaps, it is better to be conservative about the risks from such projects rather than deciding on the basis of other contexts where landscape changes might not have altered the ecological stability of river basins.

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