

INTERNATIONAL JOURNAL OF LAW
MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

Volume 4 | Issue 4

2021

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Analysis of Himalayan Ecology in Context of Hydropower Project of Tehri

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ABSTRACT

The paper deals with a deep analysis of what the story of the Hydropower Project of Tehri has been since its proposal to its commission that was done almost fifteen years back. The paper follows a strategic outline that attempts to explain the fundamental structure of Tehri Dam and its intricacies followed by its impact on the environment in which it is located. The paper also focuses on unveiling the stand of the judiciary regarding the litigations that arose in contradiction to the dam's proposal and construction. The progression of this story follows an analytical tone while unfolding the disasters that hang before the state of Uttarakhand, India at an arm's length like a dreadful siren of night and how monstrous project termed as infrastructural development, one like the Hydropower Project/Dam of Tehri, can lead to blanching aftermath should a catastrophe were to strike the state on a bad day. Numerous controversies and scandalous geographical placement of this dam make it a very interesting subject matter for a thorough analysis which this paper focuses on.

I. INTRODUCTION

The state of Uttarakhand, as known for its unparalleled beauty, is equally infamous for its fragility that often succumbs to natural disasters. The most common being floods and landslides due to weak lands and tricky mountain terrains that are prone to earthquakes. This is no news. In fact, when an earthquake hits the regions of Uttarakhand, it is always discovered to be on the lethal side of Richter's Scale with magnitudes varying from 6.6 (Uttarkashi Earthquake, 1991)² to the most recent incident of Chamoli disaster that happened in February due to cascading of Himalayan flank into the valley below. The disaster claimed well over 200 lives in its wake and swept off a hydro-electric infrastructure located in the afflicted area, costing a brutal loss of hundreds of crores.³ These catastrophic episodes are not rare flash stories but a

¹ Author is a student in India.

²J.R. Kayal, Precursor seismicity, foreshocks and aftershocks of the Uttarkashi earthquake of October 20, 1991 at Garhwal Himalaya, Elsevier B.V. (Feb. 22, 1999), <https://www.sciencedirect.com/science/article/abs/pii/S0040195197814886?via%3Dihub>.

³ J. Amos, Chamoli Disaster: 'It hit the valley floor like 15 atomic bombs', BBC (June 13, 2021), <https://www.bbc.com/news/science-environment-57446224>.

common reminder that when it comes to the state of Uttarakhand, due care is to be taken with the sanctioned propositions of infrastructure development. So, if for an instance, the government in majority decides in favor of construction of a conventional facility in a state like Uttarakhand, it has to make sure that the said facility would not compromise the environment and ecology of the area it is located in.

The analysis of such a proposal should be extremely thorough and promising that such an artificial structure, if challenged by natural threats, would manage itself against the disaster and not in turn become *the* disaster one should fear. However, this general understanding becomes quite theoretical when it comes to the topic of Tehri Dam. It being the tallest dam in India, is a multi-purpose rock and earth-fill embankment dam on the Bhagirathi River near Tehri in Uttarakhand. The primary investigation for Tehri Dam Project was checked off in 1961 and by 1972, its architectural design was finalized. Consequently, the main construction work was initiated in 1978 after the feasibility studies but the whole of project got thrust into a delayed situation when severe financial, social and environmental impacts finally came out into daylight. In this paper, I am going to magnify one of the impacts that followed the construction of Tehri dam, that is, aftermath of dam on the Himalayan ecology. This becomes a serious aspect of consideration because the mention of Tehri dam can not be done in singularity. Its construction has been a major source of controversy and conflicts for decades after its proposal. Significantly, the issue lies in its environmental setting and the threat it dangles in the face of environment around it. The vulnerable concrete structure attracts not only the attention of environmental activists but also several human rights foundations that acknowledge the element of risk the dam bears on the shoulders of locals that live in the area. Further, the paper also focuses on the litigation initiatives that are connected to the dam's existence along with the Indian Judiciary's response to them.

II. ENVIRONMENTAL SETTING OF DAM AND PURPOSE

Tehri dam is not just the tallest dam of India but also the eight highest dam in the world.⁴ With a humongous structural height of 261m (856 ft), the dam's main objective is to harness the potential water flows of two of the most important Himalayan rives, those being, Bhagirathi and Bhilangana. The dam is a crucial factor of the bigger motivation formulated with the aim of tapping the release of Upper Ganga Basin where, according to established supposition, an approximate of 7400 million cubic meters of water remains untouched and unconsumed. And

⁴ World's Highest Dams, Infoplease (Feb. 28, 2017), <https://www.infoplease.com/world/monuments-landmarks/worlds-highest-dams>.

Tehri dam is just one of the three storage facilities commissioned for fulfilling this envisage.⁵ As scheduled, the construction began in 1978 and by 2006, the dam came to be one of the highest dams in the world with an impressive elevation of 260.5 meters towards the sky and capacity to impound 3.22 million cubic meters of river water. The dam unfurls up to a length of 45 kilometers in the Bhagirathi Valley and up to 25 kilometers in the Bhilangana Valley, with a water spread domain of 42.5 sq. kilometers. It irrigates about 2,70,000 hectares of land while generating 346 MW of solid hydel power. The hydroelectric turbines at Tehri have an inbuilt capacity of 1000 MW for smooth operation to satiate the soaring need of power requirement of state of Uttar Pradesh. For this, a balancing reservoir was built at Koteshwar, 22 kilometers downstream from Tehri with an additional capacity of generating 400 MW. Along with this, when it was still under development, the dam also became an expectation that could fulfill the supply need of Delhi's drinking water.

In all the studies conducted by the committees involved in development of Tehri Dam, it was repeatedly observed that after the completion of its construction, the dam will submerge Tehri town and about 23 villages in its proximity, while also rendering 72 other villages partially submerged. Apart from this, some 5200 hectares of land will also stand destroyed at the feet of Tehri Dam. This element of dam proposal threatened to displace local civilizations and its' people who at the time were shown to be thousands in number but actual head count that found themselves to be uprooted from their lands were lakhs in number.

The area in which the said dam finds itself standing tall in the face of regional ecological system is actually built on an extremely intricate geological and seismic rocky terrain which happens to be so volatile in nature that without any detailed indications, it makes the dam an obvious threat looming over the heads of people residing in Tehri district.

III. ARCHITECTURAL THREAT POSED BY TEHRI DAM

Tehri Dam, since its scheming stage has been a very argumentative subject matter. The primary controversy resides in a physical feature of dam's location and its capability to strike the state of Uttarakhand with what would be an unfathomable setback, should a misadventure supervene on an unfortunate day. This feature being, seismicity. Uttarakhand is not a stranger to natural calamities. In fact, as mentioned earlier, the most recent incident of collapse of Himalayan Glacier in Chamoli is a very well-established case in point that how insubstantial Uttarakhand's geography can be and that already the factor of global warming makes the situation at hand

⁵ V. Paranjpaye , *Evaluating The Tehri dam: An Extended Cost Benefit Appraisal*, (1998).

trickier to handle. Many reports after the Chamoli incident, explicitly stated that, *tomorrow* is even worse than today's picture because the slow yet steady uncoiling of global warming has now started to undo a sequence of disasters that will only achieve increasing frequency with time.⁶

India's unsound policies are also one of the reasons why Himalayan region of this state is so prone to vulnerability. These development policies have magnified the scale at which a disaster [landslides, floods, earthquakes, etc.] happens in Uttarakhand. As a state of rich natural beauty and water resources, Uttarakhand has a deep hydropower potential and minerals. State's serpentine network of rivers hurtling down from great heights of Himalayas makes it a perfect center for launching hydropower projects which results into government obsessively building dams all over the state. With over a dozen such projects and various small-scale ones already in functional mode, one can understand the significance of what a grave situation this affair of government invites into not just the lives of people living in the state but also the environment in which these dams are built.

Scientists have on multiple occasions warned about a high magnitude earthquake in the Himalayan region but the truth is that even a shy, almost tender quake could unleash a colossal tragedy at the speed of light. This point, in reference to Tehri dam, is what this paper really focuses on.

Tehri Dam, which mounts Bhagirathi River, is settled on an active seismic fold.⁷ And it has always been a matter of daunting threat that if ever an earthquake of harsh intensity equivalent to eight or measured more on Richter scale were to make itself known in this region of dread, the said dam would collapse into a catastrophe so monstrous in nature that the consequences of it would unarguably outweigh the benefits from its commission, by a significant proportion too. This apprehension, however, is not infant in nature. The worry about its troublesome development has been in air since its proposal and with this regard for how geologically weak area it occupies, the unsteady hill slopes which circle the reservoir rim area, is why it was ultimately decided to build the dam with a clay-core rock-fill structure that would spare flexibility in respect to natural threat that surrounds it.

Nevertheless, this long-standing speculation is not without evidence, While, to state's fortune Tehri Dam stands tall still, yet the picture frame has already started to collect dust at corners.

⁶ S. Ramachandran, Disaster Underscores Dam Danger in India's Uttarakhand, Diplomat Media Inc. (Feb. 9, 2021), <https://thediplomat.com/2021/02/disaster-underscores-dam-danger-in-indias-uttarakhand/>.

⁷ N. Todd, The Tehri Dam, India – Stumbling Towards Catastrophe, Cultural Survival (June, 1988), <https://www.culturalsurvival.org/publications/cultural-survival-quarterly/tehri-dam-india-stumbling-toward-catastrophe>.

In its preparatory investigation, the Geographical Survey of India had discovered a fault in the river bed at the dam site which solidified the decision of building a concrete dam but it did not eliminate the problem. In fact, the dam has already developed cracks in its structure which is unnatural because it has only been a little over a decade since its commission back in 2006.

IV. CONTROVERSIES AND LITIGATIONS

1. Tehri Bandh Virodhi Sangharsh Samiti & Ors. V. State of Uttar Pradesh & Ors.

The Tehri Bandh Virodhi Sangharsh Samiti (TBVSS), a committee that came into being as a retaliation for what government intended to do in the sensitive region of Tehri. The organization filed a public interest litigation before the Hon'ble Supreme Court of India under Article 21 and 32 of Indian Constitution, questioning the construction and usage of Tehri Hydropower project and dam on the ground that the government has not considered the safety and ecological elements as the site of focus is an earthquake prone zone.⁸ The organization advocated in their writ petition saying that:

- Habitation likes of Uttar Kashi located on the river Bhagirathi would find itself in depleted state and would eventually be lost.
- The said dam to be constructed in an active seismic and tectonically risky area bears a high probability of falling apart and destroying the lives and properties of people who have settled around Rishikesh and Haridwar and other downstream regions.
- It, undoubtedly, creates a sense of insecurity in the minds of thousands of people who find themselves situated near the area because of the threat it poses on their lives, the lives that constitution ensures as the most fundamental one.⁹

Even before the petition was dismissed, while it being in the pending stage, the dam's construction continued at its regular pace. In the assessment report submitted by the TBVSS before the court, it pointed out that the dam site was an open invitation of risk, with active shoves, faults and shear zones in the area and its vicinity. In a land of such sheer complexity, the chances of dam burst were too elevated to justify the benefits it might bring in its wake. It not only endangers the human life but also the rich natural heritage of the region. Despite this, the petition was not paid heed to.

2. Court's Reaction

At the time when this petition was in the court of law, National Green Tribunal was not a solid

⁸ Tehri Bandh Virodhi Sangharsh Samiti v. State of U.P., 1992 Supp (1) SCC 44

⁹ INDIA CONST. art. 21.

existing entity that could put forward a better judgment with its touch of expertise. There was no separate regulating body that could look into the matter of enquiry which never happened thoroughly. The Supreme Court, in this case, said that it did not have the expertise that was required to formalize a final opinion about the contentions presented by the rival party who supported the dam's construction, a team of experts that represented the government. It was established by them that the government was very well in knowledge of the danger pointed by the petitioners. The facts presented by them in defense were in-detail evidences of their considerations regarding the safety of dam, that the government has considered it on several levels in synchronization with the opinions expressed by the experts. The clearance to such a construction project was given by the government only after long, deliberate and satisfying discussions and reports by the experts.

The court did after all dismiss the petition on the ground that even though there is an aspect of active seismological area, the government has covered and considered all the intricacies of the project including its safety.

3. Displaced people struggling to sustain life.

It's a symmetric system of give-and-take between the government and the general public and in light of development projects, one as demanding as Tehri Dam, the government heavily inclines in support of public trust doctrine but it comes at a price. When habitats of life are concerned and required to be taken under the wings by the government, the people living in that region face the dire consequences of leaving a life they have built behind them and this becomes the government's job to provide for them and make sure that they are properly displaced. Unfortunately, this is not the truth of this tactful world.

In a statement published by the National Alliance of People's Movements (NAPM), the organization said that even after decades of constructional work followed by almost fifteen years of Tehri Dam's commission, the basic amenities are not provided by the state authorities responsible for those people who got displaced from their homes because of this hydropower plant.¹⁰

V. IMPACT ON HIMALAYAN ECOLOGY

There was an urge before the Parliament then to persuade the Government to push back this hydropower project until a humbler and humanitarian solution was found as a replacement for

¹⁰ 24,000 people displaced because of Tehri dam have not been provided with land rights, nor do they have basic amenities, Counterview.org (Aug 18, 2015), <https://counterview.org/2015/08/18/24000-people-displaced-because-of-tehri-dam-have-not-been-provided-with-land-rights-nor-do-they-have-basic-amenities/>.

the one that supported its potentiality. This was so because given the Government did consider all the angles and paradigms of the safety regarding the Tehri dam, making sure that the dam could withstand the earthquakes regardless of its magnitude but that did little to assure the sigh of relief from other natural settings that lied around circumference of the dam like a trap. Like, the brittle hills that are adjacent to the sides of the reservoir harbor a high risk of collapse, so even if there is a chance that the dam could sustain the strike of a fatality like an earthquake, same cannot be said for those hills that bind it up like a cocoon on a branch that is breakable. And if these hills collapsed, they would cast a havoc to the downstream areas of the river upon which the dam sits tall. There was an alternative in suggestion to this too, that the high-rise dam could be converted to run-of-the-river project which would allow these hills to retain prosperity. A run-of-the-river would not only be a low-cost scheme but also provide for the irrigation and drinking water facility to the villages beside the area. In a situation like that, the locals can build an eco-friendly tourist attraction that could flourish small markets and entrepreneurs. In the same suggestion, it was also said that the authorities could promote plantation and cultivation on these hills to act as natural barriers against the landslides which have become a common picture in that area.¹¹ But any alternative found itself thrashed aside by the authorities despite the vehement protests through numerous protests, litigations and the alarming threat of its area being a highly seismic and delicate region for a high-rise dam. As known, the dam continued to be a subject of continuous development becoming a priority even though from the very start it carried the warnings of villages being submerged once the dam was ready to be commissioned and after that, rehabilitation of thousands of people that to this date is not a completed task.¹²

Another report of the evident risk of Tehri Dam, *Assessment of the Environment Impact of Tehri Dam*, headed by Shri S.K. Seth and constituted by his team concluded that there are numerous and obvious discouraging evidences that can describe the area of dam site as an endangered catchment area. Overgrazing and deforestation and other such practices have caused lasting crisis conditions on the hill sides that are very unstable in nature. In such a situation, blocking the flow of Bhagirathi River and mechanizing its flow artificially is an indication of future danger. This potential red-flag revealed that the mammoth investment which the Tehri Dam is in actuality, is not justifiable or even worth the risk with how much it can out-scale the loss if any catastrophe were to strike it, leading to a series of environmental damages that could cost loss of rich natural resources and thousands of human lives.

¹¹ J.P. Shukla, 'Damming The Protest', The Hindu Sunday: New Delhi Edition (Apr 29, 2001), p. 15-2.

¹² 'Chipko Leader's Plea On Tehri' The Hindi Daily: New Delhi Edition (Nov 29, 2001).

VI. CONCLUSION

Thus, in the matter of Tehri Dam, much less is the success achieved by the organizations that came forward as the protectors of environment and in opposition to the dam's construction. While it is essential to note that a series of events and reports have been able to establish that the dam is neither economically feasible or environmentally viable, the judiciary has remained quite aloof from passing a profound judgment over the matter. The court chose to only assess and adjudicate the question whether the Government was considerate to the danger and applied its mind to the safety of dam or not. This comes off as a subsided juristic approach that hindered the standards of judicial review that should have been more vigorous in nature. The Tehri Dam, as is in commission since 2006, remains one of the powerful symbols of the Government development projects and unfortunately stares with a menace in the face of Himalayan ecology. While the threat of it collapsing into ashes still stands, the dam has been a source of drawing hydropower from and will continue to be so for coming decades as well.
