

Rehabilitation issues and landscape vulnerability to the context of hydropower projects in Garhwal region

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Abstract

The issues of rehabilitation due to the construction of hydropower projects are renowned. In Garhwal region, it arises with the construction of Tehri high dam and continues today. Currently, about 220-power projects with 30, 000 MW capacity are proposed here. Agitation against the construction of power projects by the local people and the environmentalists is due to mismanagement and reluctant behavior of dam authority. Lacking in proper site selection and compensation packages further accentuated it. This article reviews the status of power projects in Garhwal region in view of rehabilitation and landscape vulnerability.

Keywords: Rehabilitation issue, landscape vulnerability, hydropower project, agitation, Garhwal region

Introduction

The Himalaya enjoys with rich bio-diversity and provides wide varieties of natural resources including the life sustaining water to the Indian sub-continent. In the last few years, significant increase in the number of proposed hydropower projects has been witnessed in various river basins. The enormous hydropower potential of Uttarakhand has made it synonymous with URJA-ANCHAL (Power State)¹. In 1972, The Asia's highest Tehri high dam started construction with capacity of 2400 MW electricity generation. It is 260.5 m high, characterized as earth and rock-fill and having 42 km² area of reservoir. This project led submergence of villages, 23 fully and 72 partially. During the 1980's, there were 22-hydropower projects proposed in the areas of dense human settlements and productive agricultural patches. Mushrooming hydropower projects started immediately after Uttarakhand got statehood. Currently, there are 220-power projects proposed with capacity of 30, 000 MW electricity generations. Out of which 52 large, 36 medium, and 132 are small-scale projects. These projects are certainly going to engulf the already marginalized productive agricultural fields, thus implying more hardship to local population in times to come².

Landscape vulnerability

Landscape of Garhwal region is vulnerable as it is ecologically fragile, geologically unstable and tectonically and seismically active³. It has been found to be tectonically active as indicated by recent studies^{4,5}. It falls in the seismic gap of the 1934 Bihar-Nepal earthquake and the 1905 Kangara earthquake and is categorized as Zone IV and V in the Earthquake Risk Map of India (**Figure 1**). Following the Uttarkashi (1991) and Chamoli (1999) seismic events, this region has been identified as a potential site of a future catastrophic earthquake. The growth of population and infrastructure has increased seismic vulnerability and the devastating potential of seismic tremors⁶. Apart from this, cloud bursting, debris-flow, landslides, landslips, mass movements,

and flash floods are very common phenomenon mostly during the monsoon season. Landslides are frequent along roads and the course of rivers. Consequently, many villages are vulnerable (**Figure 2 A & B**). Construction of hydropower projects and roads further accelerate fragility and instability of landscape. Submergence of land and landslides in the post construction phase of dam project is major threats for the villages that come under the periphery of dam reservoirs. Asina village, which is located on the left bank of River Bhilangana, on headwater reservoir of the Asia's highest hydropower project Tehri high dam is facing two catastrophes i.e., submergence of land and landslide (**Figure 2 C**). This is not a lonely instance; there are many villages in the periphery of Tehri high dam facing similar problems as 36 landslides exist around it. Apart from landscape vulnerability, the impact of dam reservoir on health condition is high. It was noticed in Tehri high dam reservoir where methane gas is releasing from stable water (**Figure 2 D**).

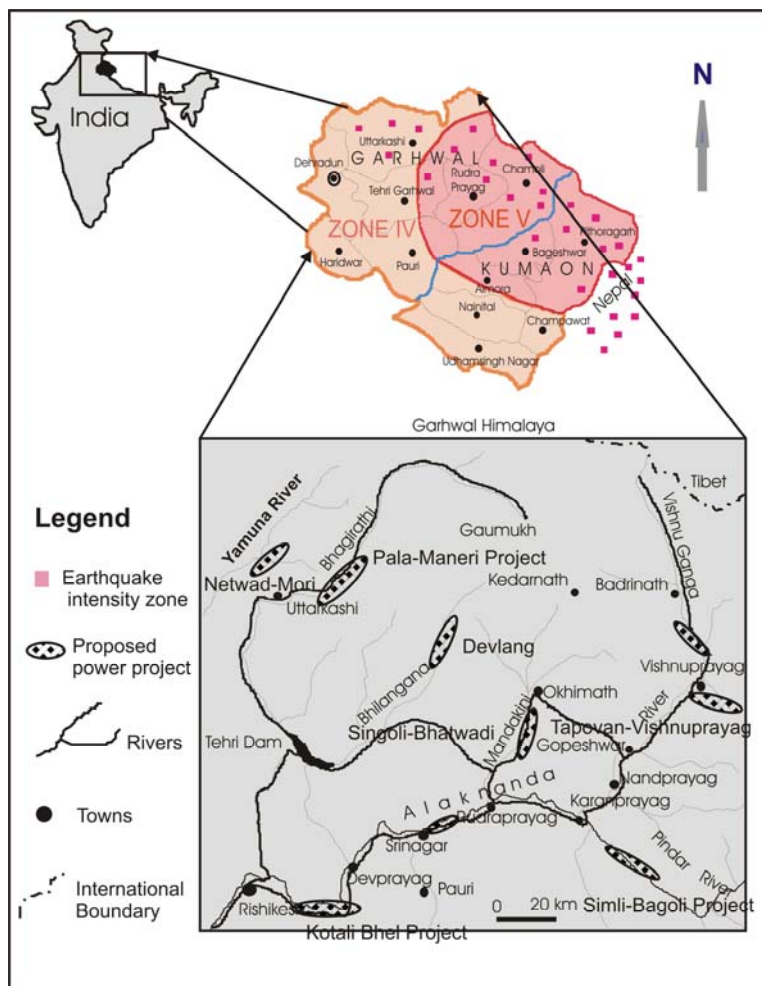


Figure 1. Map showing locations of proposed hydropower projects in Garhwal region and earthquake intensity zones in Uttarakhand

Rehabilitation issues

The issues of rehabilitation and compensation packages remain a vital for discontent to the affected people. It has a long history in Garhwal region, started with construction of Tehri high dam. Although, Tehri high dam has been generating electricity since 2005 yet, oustees have

been demanding for compensation packages until today. It has been world's most controversial dam project in terms of land instability and people's discontent on rehabilitation issue. Therefore, it took nearly 35 years to be completed. This article looks into the issues of rehabilitation and landscape vulnerability and suggests measures for smooth commencement of hydropower projects.



Figure 2. **A.** Landslide on the Rishikesh-Badrinath National High Way, **B.** Landslide between two villages opposite of Gopeshwar town, **C.** A huge landslide above village Asina below submergence of village due to reservoir of Tehri high dam, and **D.** Village in periphery of Tehri high dam getting cracks and being submerged due to reservoir.

Major hydropower projects of Garhwal region were case studied. **Table 1** reveals that 13 hydropower projects of 3003 MW capacity are proposed or under construction in 8 river valleys affecting total 101 villages directly or indirectly. Rehabilitation issues and sustainability of hydropower projects were discussed with affected households and the members of '*Jal Bachao Aandolani*' (JBA). A question, 'who should be rehabilitated and who should get compensation packages and what form' was raised. The major issues emerged are: (i) dam authorities do not involve local people in decision-making, (ii) the villages that are indirectly affected due to dam construction do not categorize for any compensation, (iii) almost every hydropower project has its own kind of impact on the affected people, and (iv) all power projects have been sold out to the private companies. The state government receives compensation relating to forest, grazing land, and other common land of the affected villages from the companies. Thus, the affected people are on the crossroad. Conflict continues between local people and the dam authorities. Agitation led by Dr. Agrawal, an environmentalist against Pala-Maneri hydropower project on Bhagirathi River in Uttarkashi got a momentum immediately after hon'ble Chief Minister of Uttarakhand laid down the foundation stone for its construction. It led a huge procession of thousands of people at dam site and consequently, the Government of Uttarakhand stop the construction work. Similarly, agitation continues against Tapovan-Vishunprayag (520 MW) and Lata-Tapovan (162 MW) power projects. Village Chai is worst affected due to construction of Vishunprayag hydropower project (400 MW) where a tunnel of 16 km is connecting Lambagarh to this village. Cracks on the houses and a sudden submergence of land took place in September 2007 but nothing is done for rehabilitation of the village until now. Khimalal of Chai

village says, *'Public Work Department of the State Government has surveyed the village for rehabilitation purposes long back but still did not disclose about resettlement of the village. This gives a picture for utterly discontent among the affected people'.*

Dam construction companies generally do not give any information to the villagers. In addition, the companies are constructing their hotels and residential colonies on the course of the Alaknanda River. The affected people of Singoli-Bhatwadi hydropower project started *Raksha Sutra Aandolan* (RSA) for conservation of forest. Gajpal Singh Negi, head of RSA informed, *'The affected people of Singoli-Bhatwadi hydropower projects have been opposing dam construction from the beginning but the authority has accepted DPR in May 2007 without involving the people'.* He further states, *'In the name of Urja state, the affected people are being homeless'.*

Table 1: Details of selected hydropower projects in Garhwal region

Hydropower projects	River valley	Capacity in MW (Construction company)	Number of affected villages and impact on them due to construction	Current situation
Vishnuprayag	Alaknanda	400 (JP)	5 villages, Perennial sources of water are dried up and cracks are placed in the villages. 30 houses damaged in Chai village	16 km tunnel constructed, connecting Lambagar and Chai village
Tapovan-Vishnuprayag	Dhaulti Ganga	520 (JP)	5 villages, agricultural land, forestland and grazing land affected	Construction work has been started
Lata-Tapovan	Dhaulti Ganga	162 (JP)	5 villages, agricultural land, forestland and grazing land affected	Construction work has been started
Singoli-Bhatwadi	Mandakini	90 (L and T)	16 villages, agricultural, grazing and forestlands affected	Construction work has been started
Srinagar	Alaknanda	330 (JBK)	20 villages and Dhari Devi temple, Individual and community land affected	Construction work is in peak
Danawa-Churena	Balganga	5 (Gunsaula)	6 villages, irrigated agricultural land, grazing land, community land affected	Power house has been constructed
Bhilangana	Bhilangana	22 (Gunsaula)	4 villages, irrigated land and forestland	Powerhouse has been constructed and tunnel is under construction
Devlang (Ghuttu)	Bhilangana	24 (Gunsaula)	10 villages, forestland, community land and grazing land affected	Tunnel is being constructed
Maneri-Bhali Phase 2	Bhagirathi	304 (NHPC)	22 villages. Natural perennial water resources are dried up. Cracks are appeared in the houses.	Under construction. Tunnel is likely to be completed.
Pala-Maneri	Bhagirathi	480 (NHPC)	2 villages, fertile cultivable land and 6.8 ha forestland	Work started in 2007 but in 2008 the work is rigorously stopped due to people's agitation
Lohari-Nag-Pala	Bhagirathi	600 (NHPC)	6 villages, 112 ha fertile land	-Do-
Jakhol-Sankari	Tons	33 (NHPC)	5 villages	Proposed, Peoples' agitation continued
Netwad-Mori	Yamuna	33 (NHPC)	5 villages	-Do-
Total 13	8 River valleys	3003 MW (5 companies)	101 villages	2 projects are proposed and 11 are under construction

Source: Compiled by the author

Agitation also continues in a 330 MW hydropower project on the Alaknanda River at Srinagar. Kalam Singh Kewat, who is a victim of this project points out, *'The decision making rights are given for the privileged class people of the village and the small group of schedule castes people are away from the process consequently, they lost their rights of ownership of agricultural land'*. He further says, *'for the construction of Dhari Devi Temple, which is coming under submergence, 9 crore rupees has been sanctioned and for those who are cultivating their crops on their own land for last 30 years are excluded for any compensation because the land is not recorded on their name in the government revenue records'*.

Discrepancies in rehabilitation and compensation processes have led agitation against the construction of hydropower projects in Garhwal region. This is mainly because of unilateral role of the dam authority in decision-making. Involvement of experts, government authorities, construction companies, and local people together is inevitable in decision-making. Micro-hydropower projects must be constructed in the areas that are least populated and least prone to landslides to avoid the problems of rehabilitation and to minimize landscape vulnerability respectively. A transparent rehabilitation policy should be framed and implemented to ensure that each household of the villages must get desirable compensation. This will reduce the role of mediators; minimize agitation, reduce construction time, and monetary loss.

Keeping landscape vulnerability and large-scale rehabilitation in view, construction of big dams are not sustainable. Meanwhile, micro hydropower projects are best suited in the fragile ecosystem of Garhwal region. There are various successful stories of generating electricity through construction of micro hydropower projects and *Gharats* (water mills). Improved *Gharats* of about 2-3 MW capacity can be constructed successfully that can supply electricity for about 25-30 villages and to run small-scale industries. A micro hydropower project on Kail Ganga at Deval town of Chamoli District is generating 2x2.5 MW electricity and supplying it for 25 villages of the watershed. Garhwal region is sparsely populated and there are the ideal locations where the risk of rehabilitation and landscape vulnerability is considerably less. Pertaining to sound rehabilitation packages major suggestions are: (i) land for land compensation, (ii) current rate of building construction in rehabilitated areas should be given as house compensation, (iii) the villages that are not coming under submergence but are indirectly being affected, a specific fund at village level should be generated, (iv) affected households may be partial shareholders of the companies, (v) the construction companies should insure the villages for any future catastrophe. Indirect losses are categorized as submergence of forestland, grazing land, community land, infrastructural facilities; educational institutions, banks, post offices, roads, health, crops, and cremation lands.

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