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BUILDING RESILIENT COMMUNITIES : REHABILITATION AND DEVELOPMENT IN THE WAKE OF HYDRO POWER PROJECTS IN KINNAUR, HIMACHAL PRADESH

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INTRODUCTION:

Hydropower projects have become a fundamental aspect of renewable energy advancement, offering sustainable energy solutions in the face of increasing environmental worries. Conflict between governments and local communities is a common occurrence in nearly all hydropower projects. The conflicts mostly develop in relation to the matters of resettlement, rehabilitation, restructuring of livelihoods, compensation concerns, and other socio-economic costs and advantages. Many irrigation dam projects neglect to adequately address the concerns of the impacted party after the project is completed (Sahoo and Sahu, 2013).

Hydropower development projects lead to the forced relocation of millions of individuals belonging to indigenous tribes, which has serious consequences for marginalized populations. Hydroelectric projects have transnational repercussions, impacting indigenous tribes in multiple nations. Hydropower, benefits in terms of renewable energy production, also has significant negative impacts on populations that are forced to relocate. (Vancleef, 2016).The matter of relocation and rehabilitation in relation to hydropower development is intricate and diverse. Syladeth and Guoqing (2016) emphasize the absence of a standardized approach to handling matters of compensation, relocation, and rehabilitation, and underscore the necessity for solutions tailored to specific contexts.

1.1 Hydropower development in Kinnaur, Himachal Pradesh

The state of Himachal Pradesh in India has great potential for hydro-power development. Himachal Pradesh is confronting similar issues to those encountered by Uttarakhand. Specially, the Kinnaur, a tribal district has been a focus point for hydropower development because to its enormous river resources and topographical benefits. Overwhelmed with projects with over one dozen of hydroelectric projects either constructed or under construction in Kinnaur, the district is in significant risks. Besides Kinnaur area like Kullu, Shimla, Chamba, and Lahaul & Spiti confront not just compensation concerns but also the threat of

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landslides and significant seismic activity. Furthermore, locations with underground tunnels are facing lower water tables and losses in agricultural and horticultural productivity (Thakur, 2015).The development of hydroelectric projects in Kinnaur has brought substantial changes, including infrastructural improvements and economic prospects. These projects have the ability to provide jobs, improve local infrastructure, and contribute to the overall growth of the region. However, the adverse effects on the environment and local residents cannot be neglected.

1.2 Environmental and Social Implications of Hydro Power Projects

The construction and operation of hydropower projects frequently result in deforestation, biodiversity loss, and displacement of local communities, all of which can damage their resilience. The local social and environmental effects of hydropower projects differ based on factors such as project type, size, and local circumstances, and they are frequently contentious. Key impacts include alterations in water flow patterns and quality; hindrances to fish migration, loss of biodiversity, and displacement of populations (Kumar et al, 2011).Hydro Power Projects have affected the life of project affected people in various ways. It has adversely affected the social support, social integration, customs and traditions of the project-affected people (Raj & Singh, 2019).

1.3 Need for Rehabilitation and Development Initiatives

The development of hydropower projects often leads to the displacement of local communities, necessitating resettlement and rehabilitation efforts. "Most compensatory measures proposed for the adverse impacts of development projects provide scandalous results, be it compensatory afforestation, rehabilitation of people, environment flows, catchment area treatment, muck disposal, catchment area treatment, fisheries plan to name a few. This is because both government agencies and developers are least interested" (Aggarwal, 2020).

While not all hydropower projects necessitate the relocation of people, involuntary displacement is a highly sensitive socioeconomic concern associated with the growth of hydropower (WCD, 2000; Scudder, 2005). The rehabilitation of those affected by the project is a significant concern, particularly in the context of hydroelectric projects that rely on storage, as evidenced by the construction of the Tehri Dam. The project faced widespread protests and public outrage due to concerns of safety, environmental impact, and rehabilitation. These issues caused significant delays, such as the Tehri dam being commissioned almost 25 years after the restoration and resettlement process began (PwC, n.d.).

In order to set up a project, appropriate quantity of land is expected to be purchased

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from various authorities like Government, Private bodies and from people. The purchase of land coupled with setting up of the project necessarily leads in change in the socio-economic character and the life styles of the local population (Pattanaik & Mohanty, 2013).

Syladeth and Guoqing (2016) has stated that "The science of resettlement and rehabilitation is still evolving, with no fixed mode for solving compensation, resettlement, and rehabilitation issues". Rapid hydropower development under existing regulatory conditions may lead to adverse and irreversible damage to the environment and local livelihoods.

Rehabilitation, thus, refers to restoring the earnings, livelihoods, and social structures of the displaced to at least the level of their pre-project condition. In short, rehabilitation is re-establishing of the income sources, livelihoods, livings and social systems. Resettlement is "the act or process of helping someone move to another place to live, or the act of moving to another place to live" (Cambridge English Dictionary, 2020). According to the Asian Development Bank (1998), the land acquisition for developmental projects leads to disruption in housing, community structure, and social systems. Productive assets, cultural identity and social harmony may be diminished. The affected people are forced to rebuild their lives, income and asset base elsewhere.

Hydropower generation is responsible for most of the displacement that occurs all over the world. World Bank (2001) in the Operational Policy 4.12 envisage, "Bank experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social and environmental risks; productive systems are dismantled; people face impoverishment when their productive assets or income sources are lost". While run-of-river projects generally introduce little social change, the creation of a reservoir in a densely populated area can entail signi?cant challenges related to resettlement and impacts on the livelihoods of the downstream populations (Kumar et. Al., 2011).

The Karcham Wangtoo in Kinnaur, Himachal Pradesh case serves as a valuable illustration of a hydropower project those results in widespread impoverishment. Only monetary compensation has been given to those who have been directly impacted, as no resettlement strategy has been started. ?

1.4 Research Objectives:

1. To study the rehabilitation and resettlement issues faced by project affected people in the study area.
2. To explore the rehabilitation and development approaches required for developing resilient communities in Kinnaur in the context of hydropower developments.

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3. To suggest Social Work Intervention for the promotion of sustainable livelihood in study area.

METHODS:

The current study is based on original data collected from field research. It was conducted in two development blocks, namely Nichhar and Kalpa, located in Kinnaur district. These blocks were selected because they host a significant number of hydro power projects, both operational and under construction. In contrast, the impact of hydro power plants in the Pooh block is relatively minimal. A sample size of 60 participants was determined using random sampling from Nichhar and Kalpa blocks, which are affected by the under-construction Shongtong hydro power project (450 Mega Watt) and the Karchham-Wangtu hydro power projects (1000 Mega Watt) respectively. According to records from the concerned sub-divisional office, there are 3391 families affected by these projects in these blocks. Respondents were selected based on their age criteria, specifically between 15 and 75 years old. A structured interview approach was employed to gather data from the respondents. The collected data was analyzed using Mega-STAT within MS-Excel.

RESULTS:

This section summarises and discusses the main findings of about the rehabilitation and resettlement issues faced by project affected people. Various Acts and policy were formulated by the government from time to time to address the rehabilitation and resettlement issues. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 has specified the details of the component of infrastructural amenities for resettlement of project-affected populations. The third schedule of the Act has mentioned that the "basic minimum amenities are to be provided to the resettled population in such a way that they can secure themselves a reasonable standard of community life and an attempt to minimize the trauma involved in displacement". The provision of infrastructure in the newly established colony or resettled area has also been enumerated. This includes pucca and accessible roads within the villages, adequate drainage and sanitation facilities, guaranteed sources of drinking water for each family and for cattle, grazing land, reasonably priced shops, Panchayat Ghars, village-level Post-Offices with savings facilities, seed-cum-fertilizer storage facilities, basic irrigation facilities, appropriate public transportation facilities, burial or cremation grounds in accordance with caste or religious preferences, public lighting and electricity connections for each household, Anganwadi centers (providers of nutritional care for mothers and their children), schools, health centers at the primary and sublevel, playgrounds for children, community centers, places of worship, etc. (Samling, Ghosh & Hazra, 2015).

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Table 3.1 Level of Satisfaction towards provision of road facilities		
	frequency	*percent*
To large extent	0	0.0
To Some Extent	13	21.7
Not at all	42	70.0
Don't know	5	8.3
	60	100.0

Source: Field Survey

The data indicates a significant dissatisfaction among respondents regarding the provision of road facilities in the areas affected by hydro power projects in Kinnaur, Himachal Pradesh. 21 per cent of respondents acknowledge that they are satisfied to some extent of provision, while a substantial 70 percent feel that road facilities have not been provided at all. Additionally, 8.3 percent of respondents are unsure or unaware of the provisions. Not even a single respondent was found who acknowledge that s/he was satisfied to the provision of a road facilities to the large extent. This distribution suggests that the majority of the community feels neglected in terms of road infrastructure development post-project implementation.

Table 3.2 Level of satisfaction towards provision of water facilities	*frequency*	*percent*
To larger extent	0	0.0
To Some Extent	3	5.0
Not at all	51	85.0
Don't know	6	10.0
	60	100.0

Source: Field Survey

Regarding the provision of water facilities, the feedback is overwhelmingly negative. None of respondents feel that water facilities have been provided to a larger extent, only 05 percent see some extent of provision, while a majority 85 percent of respondents believe that water facilities have not been provided at all. Additionally, 10 percent are uncertain or do not have enough information to comment. This stark data reveals a critical gap in essential water infrastructure, reflecting poor rehabilitation efforts in terms of basic necessities in the aftermath of hydro power project developments. The analysis of these tables indicates a concerning trend of insufficient infrastructure development in the wake of hydro power projects in Kinnaur. Both road and water facilities, which are crucial for community resilience and development, appear to be severely lacking according to the majority of respondents.

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Table 3.3 Provisions of Infrastructural facilities such as fair price shops, post office, community centre provided		
	frequency	*percent*
To Large extent	0	0.0
To Some Extent	6	10.0
Not at all	48	80.0
Don't know	6	10.0
	60	100.0

Source: Field Survey

The data indicates a notable dissatisfaction among respondents regarding the provision of infrastructural facilities such as fair price shops, post offices, and community centers in the areas affected by hydro power projects in Kinnaur, Himachal Pradesh. Specifically, none of respondents believe that these facilities have been provided to a larger extent, while 10 per cent acknowledge some extent of provision. A significant 80 per cent feel that these infrastructural facilities have not been provided at all, and 10 per cent of respondents are unsure or unaware of the provisions. This distribution suggests that the majority of the community perceives a significant lack of essential infrastructural facilities following the implementation of hydro power projects.

Table 3.4 Provision of Infrastructural facilities (aanganwadi centre and educational institutes) provided	*frequency*	*percent*
To Large extent	0	0.0
To Some Extent	7	11.7
Not at all	45	75.0
Don't know	8	13.3
	60	100.0

Source: Field Survey

The data highlights significant dissatisfaction among respondents regarding the provision of infrastructural facilities such as anganwadi centers and educational institutes in the areas affected by hydro power projects in Kinnaur, Himachal Pradesh. Specifically, none of the respondents believe that these facilities have been provided to a large extent, while only 11.7 per cent acknowledge some extent of provision. A substantial 75 per cent of respondents feel that these infrastructural facilities have not been provided at all, and 13.3 per cent are unsure or unaware of the provisions.

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Table 3.5 Provision of Infrastructural facilities such as health centre or hospital provided	*frequency*	*percent*
To Large extent	0	0.0
To Some Extent	24	40.0
Not at all	31	51.7
Don't know	5	8.3
	60	100.0

Source: Field Survey

The data indicates varying levels of satisfaction among respondents regarding the provision of infrastructural facilities such as health centers or hospitals in the study areas affected by hydro power projects. None of the respondents believe that these facilities have been provided to a larger extent, while 40 per cent acknowledge some extent of provision. A slight majority of 51.7 per cent feel that health facilities have not been provided at all, and 8.3 per cent of respondents are unsure or unaware of the provisions. This distribution suggests that while there has been some effort to provide health infrastructure, a significant portion of the community still perceives a lack of adequate healthcare facilities.

Table 3.6 Level of satisfaction among respondents regarding the provision of electricity facilities in affected areas	*frequency*	*percent*
To larger extent	0	0.0
To Some Extent	1	1.7
Not at all	52	86.7
Don't know	7	11.7
	60	100.0

Source: Field Survey

The data reveals a pronounced dissatisfaction among respondents regarding the provision of electricity facilities in areas affected by hydro power projects in Kinnaur, Himachal Pradesh. Specifically, none of the respondents believe that electricity facilities have been provided to a larger extent, and only 1.7 per cent acknowledge some extent of provision. A significant majority of 86.7 per cent feel that electricity facilities have not been provided at all, while 11.7 per cent of respondents are unsure or unaware of the provisions.

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Table 3.7 Perception of respondents towards livelihood issues affected due to the construction of hydropower projects

Statements	Measuring scale	Total	
		No.	Percent
The construction of hydropower projects has resulted in the loss of livelihood	To a large extent	28	46.7
	To some extent	19	31.7
	Not at all	11	18.3
	Don't know	2	3.3
Hydropower projects resulted in lack of basic amenities (education, health & drinking water)	To a large extent	17	28.3
	To some extent	25	41.7
	Not at all	13	21.7
	Don't know	5	8.3
Hydropower project has resulted loss of access to common property resources	To a large extent	30	50.0
	To some extent	22	36.7
	Not at all	7	11.7
	Don't know	1	1.7
Total		**60**	**100**

Source: Field Survey (n=60)

The frequency distributions represent the viewpoints of respondents in the Kinnaur district of Himachal Pradesh, India, regarding the impact of hydro-power projects on various aspects of livelihood. Firstly, concerning the loss of livelihood due to hydro-power projects, the majority of respondents (46.7%) believe it has occurred to a larger extent, followed by 31.7 per cent who perceive it to some extent. Conversely, a smaller portion (18.3%) claims it hasn't affected livelihood at all, with only a few (3.3%) unsure or lacking knowledge on the matter. Secondly, regarding the lack of basic amenities resulting from hydro-power projects, a notable percentage (28.3%) perceive it has occurred to a larger extent, while a larger portion (41.7%) believe it to some extent. A minority (21.7%) believe there has been no impact on basic amenities, while a small percentage (8.3%) are uncertain or lack knowledge. Lastly, concerning the loss of access to common property resources due to hydro-power projects, the majority of respondents (50.0%) perceive it to a larger extent, followed by 36.7 per cent who believe it to some extent. A smaller portion (11.7%) claim there hasn't been a loss of access, with a minimal percentage (1.7%) unsure or lacking knowledge on the subject.

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Table 3.8 Perception of respondents towards health issues

Statements	Measuring scale	Total	
		No.	Percent
Hydropower projects resulted in an increase in stress among project affected families	To a large extent	21	35.0
	To some extent	24	40.0
	Not at all	12	20.0
	Don't know	3	5.0
Hydropower projects has resulted in increase in health problems	To a large extent	22	36.7
	To some extent	23	38.3
	Not at all	14	23.3
	Don't know	1	1.7
Total		**60**	**100**

Source: Primary Data (n=60)

Due to the adverse impact of hydropower projects, psychosocial problems such as anger, anxiety, frustration, stress may get aggravated the situation of project-affected people. The frequency distributions in Table 3.8 reveal the perceptions of respondents in the Kinnaur district of Himachal Pradesh, India, regarding health issues arising from hydro-power projects. Firstly, concerning the increase in stress among project-affected families, a significant portion (35.0%) believes it has occurred to a larger extent, while a slightly larger percentage (40.0%) perceives it to some extent. A minority (20.0%) claim there hasn't been an increase in stress, with a small percentage (5.0%) expressing uncertainty or lack of knowledge. Secondly, regarding the increase in health problems among project-affected families, a comparable portion (36.7%) believe it has occurred to a larger extent, with a slightly smaller percentage (38.3%) perceiving it to some extent. A minority (23.3%) claim there hasn't been an increase in health problems, while a negligible percentage (1.7%) express uncertainty or lack of knowledge on the matter.

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Table 3.9 Perception of respondents towards community development approaches under the Local Area Development Authority (LADA)

Statements	Measuring scale	Total	
		No.	Percent
1. Compensation amount provided to the Project Affected People is sufficient.	To a large extent	4	6.7
	To some extent	12	20.0
	Not at all	36	60.0
	Don't know	8	13.3
2. An extent of loss coverage provided to the Project Affected People is sufficient.	To a large extent	2	3.3
	To some extent	19	31.7
	Not at all	34	56.7
	Don't know	5	8.3
3.Local Area Development Authority (LADA) scheme are very supportive	To a large extent	6	10.0
	To some extent	35	58.3
	Not at all	8	13.3
	Don't know	11	18.3
Total		**60**	**100**

Table 3.9 present the perspectives of respondents regarding various aspects of support and compensation provided to project-affected individuals. Firstly, concerning the sufficiency of compensation amounts provided to project-affected people, a small fraction (6.7%) believe it has been sufficient to a larger extent, while a slightly larger percentage (20.0%) perceive it to some extent. However, a significant majority (60.0%) disagree, stating that the compensation has not been sufficient. A notable portion (13.3%) expresses uncertainty or lack of knowledge on the matter. Secondly, regarding the adequacy of coverage for losses provided to project-affected individuals, an even smaller proportion (3.3%) perceive it as sufficient to a larger extent, with a larger portion (31.7%) considering it to some extent. Conversely, a significant majority (56.7%) disagree, stating that the coverage has not been sufficient. A few respondents (8.3%) express uncertainty or lack of knowledge on this aspect. Lastly, regarding the supportiveness of provisions for local area development under the Local Area Development Authority, a minority (10.0%) perceive it as supportive to a larger extent, while a larger portion (58.3%) consider it supportive to some extent. However, a significant fraction (13.3%) perceive these provisions as not supportive at all. A notable number of respondents (18.3%) express uncertainty or lack of knowledge on the

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supportiveness of these provisions.

The indigenous people of Kinnaur traditionally sustain their livelihood through heritage-based enterprises like handlooms, handicrafts, ecotourism, medicinal plants, and agro-products, alongside cattle and sheep rearing. Livelihood has been significantly impacted by the construction of hydropower projects on the Satluj River in Kinnaur. These projects have improved road connectivity to remote areas, facilitating transportation and cost savings for the tribal communities. Previously, these communities focused on subsistence farming and animal husbandry, but now they cultivate lucrative cash crops such as apples, almonds, peas, and lychee, altering their economic base. However, traditional crops like maze, barley (locally known as "ogla" and "pafra"), are declining. The construction of tunnels and transmission lines has encroached upon large forest areas, diminishing forest produce like Neoja and medicinal plants. While road conditions have improved, increasing landslide risks due to the hydropower projects have also disrupted connectivity. Professional social workers can facilitate connections and support between project-affected individuals and various government departments such as Culture Affairs, Irrigation and Public Health, Agriculture, Horticulture, Animal Husbandry, and MSMEs. Recognizing the importance of preserving heritage-based enterprises, social workers can also educate and provide training on updated tools and technologies for these enterprises. Additionally, social workers play a crucial role as guides to access government services, counselors to help project-affected families cope with challenges, and educators on forest rights, human rights, and provisions of resettlement and rehabilitation policies.

CONCLUSION:

The hydropower project has benefited affected populations with improved access to education, roads, healthcare, and employment opportunities, along with compensation and community facilities. However, the project has severely impacted tribal livelihoods, making them insecure about accessing common resources. Many affected individuals due to lack awareness of available infrastructure like community centre, educational institutes and health centers under the Resettlement and Rehabilitation policy. Agriculture and Horticulture is the chief occupation in the studied projects. The Project-affected people or local people should be encouraged to grow the staple food such as buckwheat (commonly known as "Ogla and Pafra" in Kinnaur), Kodda(a variety of Rice) and local produce such as Kala Zeera and Meetha Saunf (also known as Dhansoa). Training programs should be provided to local artisans, particularly women and girls, to enhance and promote their handloom and handicraft products. Hydropower project authorities, with active involvement from the local community, should develop sustainable resources by identifying and prioritizing

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local needs. These resources could include the establishment of small-scale industrial units, water tanks, playgrounds and stadiums, school buildings, hospitals, community halls, and other essential facilities.

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