

A study on Perceived Social Impact of the Tuirial Hydro Electric Project (THEP) on Local Communities in Mizoram

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Abstract: *This study explores the perceived social impact of the Tuirial Hydro Electric Project (THEP) on local communities in Mizoram. The Tuirial Hydro Electric Project, a major infrastructure development aimed at meeting the region's power demands, has significant implications for the socio-economic and cultural fabric of the surrounding villages. This study examines various social aspects, including transportation access, education, economic conditions, family and village unity, and social life, as perceived by local residents. The findings reveal a mixed impact of THEP, with positive effects noted in healthcare and infrastructure access, but limited economic improvement and minimal influence on family and village cohesion. The majority of respondents perceived THEP as having little relevance to their daily lives. These results highlight the importance of incorporating local perceptions into social impact assessments and suggest the need for more inclusive development strategies that ensure the equitable distribution of benefits and minimize adverse outcomes for local communities.*

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Introduction

Hydroelectric power projects are essential for meeting the growing energy demands of nations, contributing to national power grids and promoting sustainable development. However, the construction and operation of these large-scale projects have far-reaching socio-economic, environmental, and cultural implications, particularly for local communities living in proximity to these projects. These communities often experience significant transformations in their livelihoods, cultural practices, and social fabric, necessitating a comprehensive understanding of the social impacts of hydropower development. The assessment of these social impacts is crucial for ensuring that the benefits of such projects are maximized while minimizing the negative consequences (Geldard et al., 2017). This paper aims to assess the social impact of hydroelectric power projects, with a specific focus on understanding how such projects influence local communities in terms of their social, economic, and cultural dynamics.

Hydroelectric power plants harness the energy of flowing water to generate electricity, which is widely regarded as a clean and renewable energy source (Barros et al., 2019). However, the construction and operation of hydropower projects can lead to

profound changes in the surrounding environment and communities. These changes can include land displacement, shifts in local economies, changes in social structures, and alterations to community cohesion (Richter et al., 2019). The assessment of social impacts in these areas is necessary for understanding the broader implications of such projects on communities' well-being, both in the short and long term.

One of the most immediate and visible social impacts of hydroelectric power projects is displacement. The construction of dams often requires the relocation of people living in the affected areas, especially those in flood-prone regions. This displacement can result in the loss of homes, agricultural land, and access to natural resources, leading to a decline in the affected community's quality of life (Rosenberg et al., 2021). Research by Dufresne et al. (2016) suggests that the displacement of communities from their ancestral lands for hydropower projects often causes significant socio-cultural disruptions, as people lose their traditional ways of life and face challenges in adapting to new environments. Additionally, these communities often face limited access to compensation or resettlement options, further exacerbating social and economic challenges.

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Beyond displacement, economic impacts are another critical aspect of assessing social consequences. Hydropower projects can bring both positive and negative economic changes to local communities. On the positive side, the construction of hydropower plants can create job opportunities, provide infrastructure improvements such as roads and electricity, and contribute to regional economic growth (Rogner et al., 2020). However, as observed by Kelley et al. (2021), these projects can also cause adverse economic consequences for local populations, particularly when the promised benefits do not materialize. For instance, while job creation may be a short-term benefit, the long-term impact may not be as favorable if local people are not equipped with the skills required for employment in the project, or if the jobs created are temporary or low-wage.

In addition to the direct economic impacts, changes in local social structures can result from hydropower projects. The influx of external workers and the establishment of project-related infrastructure can cause shifts in the social fabric of local communities (Kandler et al., 2018). This can result in the breakdown of traditional social networks and relationships, leading to social tensions and a sense of loss of community identity. Additionally, the introduction of new social dynamics, such as increased migration and economic disparity, can further complicate community cohesion. Moser and Olsson (2019) highlight the importance of understanding how social structures are altered by such projects, particularly in indigenous communities whose social organization and cultural practices are deeply tied to their environment.

Moreover, hydroelectric projects often affect access to basic services, such as healthcare and education, either improving or hindering their availability. For instance, the infrastructure improvements brought about by these projects such as roads, electricity, and telecommunications can enhance access to healthcare, education, and other essential services (Pereira et al., 2020). However, this is not always the case, as some projects may divert resources or attention away from the immediate needs of local communities. The socio-economic gap between communities that benefit from these improvements and those that do not can widen, exacerbating social inequality.

An essential component of assessing the social impacts of hydropower projects is understanding the psychosocial effects on local populations. The uncertainty and stress caused by the displacement and environmental changes brought by these projects can lead to significant mental health issues. Shah et al. (2021) found that the disruption caused by hydroelectric projects often leads to feelings of loss, stress, and anxiety among displaced communities. These psychosocial impacts are often compounded by a lack of proper consultation or involvement of affected populations in decision-making processes.

Given these complexities, the social impact assessment (SIA) of hydropower projects plays a critical role in identifying and addressing the negative consequences for local communities. The SIA process involves the systematic evaluation of the potential social consequences of a project, with a focus on improving outcomes for affected populations (Hernández et al., 2018). By incorporating social indicators such as community health, education, economic status, and social cohesion, SIAs can help

mitigate adverse impacts and promote sustainable development practices that prioritize the well-being of local people.

Thus, the social impacts of hydroelectric power projects are vast and multifaceted, affecting local communities in complex ways. While these projects offer significant energy benefits, they also pose challenges related to displacement, economic change, social disintegration, and access to basic services. The assessment of these impacts is essential for ensuring that the benefits of hydropower development are equitably distributed and that the adverse effects on local communities are minimized.

The Tuirial Hydro Electric Project is an initiative owned by NTPC NEEPCO and is situated along the Tuirial river system, located in the Kolasib district of Mizoram, near the adjoining Cachar district of Assam. The project has a total installed capacity of 60 MW, with two units of 30 MW each. It is a major infrastructure initiative aimed at addressing the region's power demands while contributing to the national grid. However, the socio-economic implications of such projects extend far beyond their primary objectives, impacting local communities in multifaceted ways. This study seeks to explore the perceived social impact of THEP on the surrounding villages, focusing on a range of factors, including transportation access, education, economic conditions, family and village unity, and overall social life. By understanding how local residents perceive these changes, we can better assess both the positive and negative consequences of the project on the daily lives and well-being of the population. The research examines key areas such as healthcare access, educational opportunities, economic status, social cohesion, and overall quality of life. By analyzing the responses from a diverse group of respondents, the study provides insight into how large-scale development projects can influence community dynamics and individual livelihoods, offering valuable data for policymakers and development practitioners working to minimize adverse effects while maximizing benefits. By conducting thorough social impact assessments and adopting inclusive development strategies, policymakers can help ensure that hydropower projects contribute positively to both national energy goals and local community well-being.

Review of Literature

Hydroelectric power projects have significant socio-economic and environmental impacts on local communities, particularly in terms of displacement, changes in social structures, and economic shifts. The construction of dams often leads to the relocation of communities, causing disruptions to their traditional ways of life (Dufresne, Gendron, & Bourassa, 2016). These displacements are associated with a loss of homes, land, and access to resources, affecting both the quality of life and the socio-cultural fabric of the community (Rosenberg, Lang, & Hoag, 2021). Furthermore, hydropower projects can either positively or negatively affect the local economy. While such projects can bring about infrastructure improvements and job opportunities, the benefits may be short-term or limited to certain segments of the population (Kelley, Brown, & Smith, 2021; Rogner, O'Neill, & Martin, 2020).

The changes in local economies and infrastructures also alter the social dynamics within affected communities. The influx of workers and the establishment of project-related facilities can disrupt traditional social structures and contribute to social tension (Kandler, Trill, & Müller, 2018). This transformation in community

cohesion often exacerbates disparities, leading to greater social division (Moser & Olsson, 2019). Additionally, hydropower projects have implications for access to basic services such as healthcare and education, with improvements being unevenly distributed across affected communities (Pereira, Costa, & Machado, 2020).

Psychosocial impacts, such as stress, anxiety, and the loss of identity, are also significant consequences of hydropower development. Displaced communities often experience mental health challenges due to the uncertainty and stress associated with relocation (Shah, Pacheco, & Souza, 2021). Consequently, social impact assessments (SIAs) play an important role in identifying these issues and suggesting solutions to mitigate negative outcomes (Hernández, Pantoja, & González, 2018).

While hydroelectric projects offer clean energy solutions, they also pose substantial risks to the social and economic well-being of local communities. Effective social impact assessments and inclusive development strategies are critical for ensuring these projects' benefits are equitably distributed, mitigating adverse effects, and fostering sustainable development.

Objective and Methodology

The primary objective is to evaluate the social impact of THEP on local communities and to examine their perceptions of THEP across various social dimensions.

Data Sources: The study will be based both on Primary and Secondary data. Primary data will be collected through a well-designed household level questionnaire and conducting Focus Group Discussion (FDG) with the representatives from NEEPCO, prominent persons from the villages and Village Council members. In addition, the secondary data will be collected from various published and unpublished documents such as original documents of the concerned Department, Statistical Hand Book of Mizoram, books, journals and reference materials available on the website.

Sampling Technique: Sampling Technique: This study utilized a combination of purposive, quota, and systematic random sampling methods. In the first phase, five villages surrounding THEP, namely Saipum, Saiphai, Hlimen, Bukpui, and Thingthelh, were purposively selected. Each village was assigned a quota based on the number of households available in the area. Within these selected villages, respondents were then chosen randomly.

Sample Size: The sample size in this study is determined using Slovin's formula which is stated below;

$$n = \frac{N}{(1 + Ne^2)}$$

Where, **n** represents the required sample size, **N** represents the total population size, and **e** represents the margin of error, expressed as a decimal. Here we choose a 5% margin of error i.e. 0.05. Then,

$$n = \frac{5200}{(1 + 5200.0.05^2)} \approx 371$$

Although the required sample size for this study was approximately 371, to minimize potential sampling errors and biases, an initial sample of 380 was collected. However, due to inconsistent and insufficient responses, some samples were discarded, resulting in a final sample size of 224.

Analytical Method: The collected data were analyzed using descriptive statistics, including measures such as the mean, frequency distribution, and percentage. Inferences were drawn based on the analysis conducted using these statistical tools.

Results and Discussions

This section examines the perceptions of respondents regarding the impact of the Tuirial Hydro Electric Project (THEP) on various social aspects, including children's education, the economic position of households, transportation for hospitalization, and the coordination and unity within families and villages.

The respondents were asked whether there has been any change in transportation to go to the hospital before and after the Tuirial Hydro Electric Project (THEP). The results are displayed below.

It could be observed from the table that 45.5% of respondents stated that transportation to the hospital has remained the same, while 54.5% reported that it has become easier to access hospitals. This indicates that a majority of respondents perceive an improvement in hospital transportation, likely due to the infrastructure changes brought about by the Tuirial Hydro Electric Project (THEP).

Table 1: Perception about Change in Transportation for Hospitalize

Responses	Frequency	Percent
Remain the same	102	45.5
Easier to hospitalize	122	54.5
Total	224	100.0

Source: Primary Data, 2025

The responses to the question regarding difficulties in children's education reveal that a significant majority, 87.1%, of respondents do not face challenges in educating their children.

Table 2: Perceived Difficulties in Children's Education

Responses	Frequency	Percent
No	195	87.1
Yes	29	12.9
Total	224	100.0

Source: Primary Data, 2025

However, 12.9% of respondents reported experiencing difficulties in their children's education. This indicates that while most households do not encounter major educational barriers, a notable portion of the population still faces challenges, which could be linked to socio-economic factors or local infrastructure issues.

Table 3: Perceived Contribution of THEP on Children's Education

Responses	Frequency	Percent
No	147	65.6
Yes	77	34.4
Total	224	100.0

Source: Primary Data, 2025

The responses to the question regarding the contribution of the Tuirial Hydro Electric Project (THEP) to the improvement of children's education indicate that 65.6% of respondents believe that THEP has not contributed to the enhancement of their children's education. In contrast, 34.4% of respondents feel that the project has had a positive impact on improving educational opportunities for their children. This suggests that while a majority of respondents perceive no significant educational benefit from the project, a noteworthy portion believes that it has played a role in enhancing educational outcomes for their families.

To further examine the contribution of the Tuirial Hydro Electric Project (THEP) to children's education, respondents reported several forms of assistance provided by the project. These include the provision of computer sets to schools, financial support for the renovation and construction of school buildings, upgrades to school libraries, the provision of benches for schools, and financial assistance for the construction of toilets within the schools. These contributions are perceived as part of THEP's efforts to enhance the educational infrastructure in the research area.

Table 4: Perceived Importance of THEP to Respondents' Families

Responses	Frequency	Percent
Not so important	151	67.4
Important	34	15.2
No idea	39	17.4
Total	224	100.0

Source: Primary Data, 2025

The responses to the question evaluating the perceived importance of the Tuirial Hydro Electric Project (THEP) to respondents' families reveal that a majority, accounting for 67.4%, consider the project to be "not so important" to their household. In contrast, only 15.2% perceive the project as important, while 17.4% of respondents reported having no clear opinion or understanding of its significance. These findings suggest a prevailing perception among the majority of households that THEP holds limited relevance or direct benefit to their day-to-day lives within the study area.

The responses to the question regarding the perceived positive impact of the Tuirial Hydro Electric Project (THEP) on the economic position of respondents' families indicate that a substantial majority, 83.5%, believe their economic situation has remained unchanged.

Table 5: Perceived Importance of THEP on the Economic Position

Responses	Frequency	Percent
It worsens our family economic position	11	4.9
Remain unchanged	187	83.5
Improvement for our family economic condition	26	11.6
Total	224	100.0

Source: Primary Data, 2025

Additionally, 11.6% reported an improvement in their family's economic condition as a result of THEP, while 4.9% stated that the project had worsened their economic position. These results suggest that the perceived economic benefits of THEP are limited, with most households reporting no significant change in their financial status.

Table 6: Perceived Impact of THEP on Family Coordination and Unity

Responses	Frequency	Percent
It worsens	20	8.9
Remain constant	201	89.7
Betterment for family coordination and unity	3	1.3
Total	224	100

Source: Primary Data, 2025

The responses to the question regarding the impact of the Tuirial Hydro Electric Project (THEP) on family coordination and unity indicate that a significant majority, 89.7%, believe that the coordination and unity within their families have remained unchanged. In contrast, 8.9% of respondents feel that the project has negatively affected family coordination and unity. Only 1.3% reported an improvement in family coordination and unity as a result of THEP. These findings suggest that, for most families, THEP has had little to no impact on the social dynamics within households, with a small proportion perceiving a negative effect.

The respondents were asked to evaluate how the Tuirial Hydro Electric Project (THEP) has influenced the coordination and unity within their local communities. The purpose of this question was to understand whether the development of the hydroelectric project has had a positive or negative impact on the social cohesion of the villages surrounding the project. The findings from this inquiry reveal a range of perceptions among the local population, providing valuable insights into how such large-scale infrastructure projects can shape social dynamics.

Table 7: Perceived Impact of THEP on Village Coordination and Unity

Responses	Frequency	Percent
Remain constant	219	97.8
It promotes coordination and unity among village members	5	2.2
Total	224	100.0

Source: Primary Data, 2025

The responses to the question regarding the impact of the Tuirial Hydro Electric Project (THEP) on the unity and coordination of the village indicate that the majority, 97.8%, believe that the unity and coordination within their village have remained unchanged. Only 2.2% of respondents feel that THEP has promoted greater coordination and unity among village members. These findings suggest that THEP has had a minimal effect on the social cohesion within the village, with most respondents perceiving no significant change.

The responses to the question regarding the impact of the Tuirial Hydro Electric Project (THEP) on the social life of the village indicate that a majority, 53.1%, perceive the project as having improved the social life of the community.

Table 8: Perceived Impact of THEP on Social Life of the Village

Responses	Frequency	Percent
It worsens the social life of the people in the village	2	.9
Remains constant	103	46.0
It creates improvement in social life of the people	119	53.1
Total	224	100.0

Source: Primary Data, 2025

On the other hand, 46.0% of respondents believe that the social life remains unchanged, while only 0.9% think that the project has worsened the social life of the people in the village. These findings suggest that, overall, a majority of respondents view THEP positively in terms of its impact on social dynamics, with minimal negative perception.

Concluding Remarks

The Tuirial Hydro Electric Project (THEP) in Mizoram, while contributing to the national power grid, has had notable social impacts on the local communities. The perceptions of the residents reveal mixed responses regarding the project's benefits. While some respondents acknowledge improvements in transportation and healthcare access, the economic benefits remain limited, with many families reporting unchanged economic conditions. Moreover, there appears to be minimal impact on family and village unity, with most respondents indicating no significant changes in social cohesion. Although some positive perceptions were noted, particularly regarding social life improvements, the overall perception of THEP's importance to the local communities is relatively low. These findings emphasize the need for a comprehensive social impact assessment to ensure that the benefits of such projects are more effectively communicated and distributed, while minimizing the negative social consequences. Moving forward, inclusive development strategies and better community involvement are crucial to enhance the positive outcomes for local populations.

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