

# Social Impact of Chukha Hydro Power on its Local Population in Bhutan

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## Abstract

This study focuses on Social impacts of Chukha Hydro Power on its local community in Chukha, District of Bhutan. It explores the social impact of Chukha Hydropower on the local community in the post commissioned era and it will spell out the multiple areas like Quality of life, Dependent Variable and selected Independent Variables like Housing Security, Electricity Supply, Bank, Education, Hospital, Transportation, Water & Sanitation, Road and Telecommunication positively or negatively impacted by commissioning of Chukha Hydropower Project. Local community strongly agreed that Chukha Hydropower has supplied them with sufficient electricity. Whereas, the local community have not been benefited enough in terms of business and agro-production opportunities. The detailed study on Chukha Hydropower's social impact has been conducted with the help of exploratory research with the sample size of 115 respondents through structured questionnaires with the help of correlation and regression on the multiple areas as stated above. It is observed that the social impact of Chukha Hydro Power in terms of healthcare service, education, road infrastructure and housing security on the local population is positive but other areas of concern are not too positively impacted as given in the conclusion. This study clearly explores the impact of Chukha Hydropower on the local community by collecting the perspective of local people within the looped jurisdictions through exploratory research and structured questionnaire with sample size of 115 respondents in Chukha district of Bhutan. Pearson correlation test and regression analysis applied to find out the impact on local community using appropriate software.

**Keywords: Hydropower Project, Bhutan, Electricity, Social Infrastructure**

## I. INTRODUCTION

Chukha Hydropower is one of the oldest mega power projects in Bhutan. The project was fully funded by Government of India with 60 percent grant and 40 percent loan at the interest rate of 5 percent payable over a period of 15 years after commissioning. The Chukha Hydropower, which was formed in 1975, was entrusted with the responsibility of constructing and commissioning of the project (Druk Green, 2017). To study the social impact of hydropower plant in Bhutan, literature review has been done to understand the role and impact of hydropower plants in details in the other parts of the world.

Adhikari,( 2014) states “ Men and women have different views on the benefits of hydropower plant Quality of life is more important for men and reduced work load expenditures and an improved health care for women”. Castaldi, Chastain, Windram, & Ziatyk,( 2003). “Different in cultural values and beliefs are suddenly merged together in new settings because of relocating”. Tshering & Tamang, (2004) states on “spin-off effects like the project road access, grid electricity, schools & hospitals built during project construction period and other income generating activities including some employment opportunities in the project. According to Tshering and Tamang (2004), the sustained techno-economic cooperation between India and Bhutan will be the key success factor for development of community. Castaldi,et.al, (2003).”Hydroelectric power plants have significant effects on the human environment in and near the site area”. Chandy, et.al, (2012) states “changes in land use, involving mainly conversion of agricultural lands and forests to roads, tunnels, buildings, or other components because of the projects”. According to Sanunnaam, N., Sajjakulnukit, B., & Songprakorp, R. (2012) “to the light at night time the villager can take time for exchanging ideas with each other, the children read books longer time and old people understood more”. Lata, R., Rishi, M. S., Kochhar, N., & Sharma, R. (2013) states that such developments had altered and diverted the natural river flows, affecting existing rights and access of the locals to water and resulting in significant impacts on livelihood and the environment. Gurung, A., Bryceson, I., Joo, J., & Oh, S.-E. (2011) mentioned that modern electric lights in the households allow more time for students to conduct their study during night time. Access to electricity reduces drudgery for women in the village allowing them to have enough time to be involved in other household related activities including income-generation and social and community development activities. Additionally, many researchers states that hydropower not only provides electricity for rural communities but also helps to accelerate rural economic development if the power is integrated with agricultural production and other income generating businesses; plus less fuel wood is consumed. According to Adhikari, (2014), Hydropower helps to rise social life and generate income and employment by establishing new businesses for local people. Chandy, Keenan, Petheram, & Shepherd, (2012) states that local area development program, hydropower companies undertake community development projects such as school repair, road and footpath construction, electrification and water supply for villages, and livelihood skill development in project affected areas.

After reviewing of aforesaid literature, few outcomes can be observed that these projects are viable and beneficial to the country at large whereas it is not confirmed that this micro or mighty hydropower projects are really beneficial to the local community at large. Apart from it, this study finds out the social impact on development of education, road, banking, electricity, potable water and so on.

## II. DATA ANALYSIS AND INTERPRETATION

This study clearly explores the impact of Chukha Hydropower on the local community by collecting the perspective of local people within the looped jurisdictions through exploratory research and structured questionnaire with sample size of 115 respondents. Pearson correlation test and regression analysis applied to find out the impact on local community using SPSS as given below-

Table - 1

		Correlations								
		CHP has benefited community (Domestic Security-Housing security)	CHP has benefited community (Domestic Security-Electricity)	CHP has benefited community (Public Service-Bank)	CHP has benefited community (Public Service-Education)	CHP has benefited community (Public Service-Hospital)	CHP has benefited community (Public Service-Transportation)	CHP has benefited community (Infrastructure- Water and Sanitation)	CHP has benefited community (Infrastructure - Road)	CHP has benefited community (Infrastructure-Telecommunication)
CHP has benefited community (Infrastructure-Improved the quality of life)	Pearson Correlation	.530**	.335**	.343**	.453**	.473**	.538**	.628**	.586**	.519**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	114	114	114	114	114	114	114	114	114

\*\* .Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

Table - 2

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739*	.546	.507	.544

To measure social impacts of Chukha hydro power, the Quality of life is taken as an important parameter as dependent variable and independent variables like Housing Security 53%, Electricity Supply 33%, Bank 34%, Education 45%, Hospital 47%, Transportation 53%, Water & Sanitation 62%, Road 53%, and Telecommunication 51% respectively. Regression explains a very strong correlation between dependent and independent variables of 73%. Whereas, R Square with 54% explains a strong relation between the quality of life and with the independent variables.

## III. CONCLUSION

As per respondents, Chukha Hydropower has direct positive impact on the local community in terms of Housing & Security, Transportation, Water & Sanitation, Road and Telecommunication whereas other areas of social infrastructures like Banking, Education and Hospital has not been able to register the positive improvement in the life of local community. It reveals that Chukha Hydropower is not solely able to meet the basic necessities and social infrastructure at large scale. This is also responsibility of government to frame policy and channelize corporate social responsibility funds of corporate sector of Bhutan through institutionalization and make the institutions accountable for social infrastructure and local community development with transparency in Bhutan to achieve the goals of Gross National Happiness (GNH).

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