Impact of the Baglihar Hydropower Project on the Local Economy: An Assessment of Employment and Local Business on the Households of Chanderkote Village in District Ramban, Jammu and Kashmir

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***Abstract*—Infrastructure is the physical framework that provides goods and services to the public. It connects to the economy by affecting economic activities, generating spillover effects, and contributing to substantial investment expenditures. Investment in hydropower enhances social and economic well-being through income, employment generation, and business creation for local communities. This study attempts to examine the impact on employment generation and local business creation during and after construction of the Baglihar Hydropower Project (BHP) in village Chanderkote, one of the important hydropower projects in J&K on the river Chenab. The present study is based on empirical research with the identified sample size of respondents through a well-structured questionnaire. It was found that this project has benefited the rural community in terms of employment, occupation, and market expansion for local peo-ple. Outcomes of the study will help to access the impact of BHP on the local economy. Finally, the paper provides recommendations to improve the economic impacts like employment and market effects of any kind of infrastructural investment for the benefits of the local community so that they need not mobile to other regions for their employment and livelihood due to the construction of Hydropower projects.**

***Index Terms*—Employment generation, Hydropower Project, Investment, Infrastructure, Local business creation.**

I. INTRODUCTION

Hydropower is the procedure of harnessing the power of water to produce electricity. It is the world's prominent source of renewable energy, a green and clean alternative to fossil fuels, often reflected as carbon free energy source (Brown 2008, Gurung 2011). Hence, it is often considered as an unpaid factor of production because power investment has a domino effect in terms of employment creation, energy and other multiplier effects. Infrastructure contributes in accelerating the economic development of a country both by increasing productivity of factors of production & improving the quality of life (Infrastructure Development in India, Jetli & Sethi). In India, unemployment is stubborn because of a lack of production capacity due to low capital investment by the different sectors in the economy (Adhikari,2014). The problem of employment opportunity remained a highly sensitive issue between the project executors and project affected people (Butt,2013). Currently, youth unemployment is one of the major challenges faced by the state of Jammu & Kashmir. With the number of educated unemployed youth running in lakhs, the absence of industrial growth and continuation of agriculture and allied sectors as a subsistence sector on which 70 percent of the population is engaged directly and indirectly (DOS 2017). Thus, it is widely accepted that investments in infrastructure can lead to direct and indirect jobs, and usually have spillover effects into other economic opportunities. However, the anticipated benefits of these investments are not always fully realized, or sometimes they happen much later (Bacon & Kojima 2011), Scott 2013). Small hydro power project opens up immense opportunities for social and economic upliftment of the village communities. The hydropower projects demonstrate that a company's social and environmental impact in the energy sector can be significant when it emphasizes staff training,

CSR and high environmental performance standards (Scott 2013). According to Emily Bird's study (2012), the socioeconomic impact analysis of a large infrastructure development project indicates the relationship between a water body, the local economy, and the local people, which determines the cost and benefits experienced by the portion of the population residing in the nearby area.

The World Bank intends to develop a framework for enhancing the development benefits to the local community from the hydropower projects for which it has been focusing on making big push investment on these projects in the developing world. The hydropower investments can have positive outcomes by removing poverty and also help attain the Millennium Development Goals (MDGs). The various research studies on hydropower bring to notice the need for recognizing multiple opportunities for the local community, which can improve their social and economic conditions in terms of employment generation, compensation mechanisms, and other monetary and non-monetary benefits.

Profile of BHP and study area

District Ramban was engraved out of the erstwhile district Doda keeping in view the backwardness, and aspirations of the people of the area. It has started functioning as a sovereign unit on 1st april,2007. The Baglihar Dam is also known as the Baglihar Hydro-Electric Project (BHP) is a run-of-river power project and the gravity dam located across Chenab river, some 5 km away from village Chanderkote in the Ramban district of Jammu & Kashmir state. The village with 255 households having the total population of 1501, which comprised of 872 males and 629 females, total 65 are scheduled caste and 307 are scheduled tribe population. (Census 2011). It is one of the most substantial development in infrastructure sector in district Ramban. This project was perceived in 1992, sanctioned in 1996 after the lot of objections by Pakistan claiming India for violating Indus Water Treaty (IWT) 1960 and construction began in 1999. The main purpose of Dam is to generate Hydroelectricity (DCH 2016-17). The project has commenced its construction with the estimated cost of USD $1 Billion. BHP, stage-I was commissioned in 2008-09 and Stage-II was commissioned in 2015-16 (Economic survey, 2017).

Construction work:- JAL, India and SNC-lavalin, Canada, Government actors: - GOI and Government of J& K. Operating and maintenance agency: - JKSPDC. The financial assistance was borrowed from the World Bank (WB).

II. REVIEW OF LITERATURE

Local Area Development Program

Madan (2010) observed that the commencement of hydropower can enhance the basic infrastructure in the local community which is entirely the responsibility of the project authority. Parek and Tshering (2017) analysed that hydro projects have positive derivative effects in terms of health and educational facilities, roads, access through electricity on the native people. Thus, these projects have favourable impact on social infrastructural development of local community to attain the target of Gross National Happiness (GNH). Emily Bird Vermont (2012), The study determines the socio-economic impact of hydroelectric dams on the communities of the Macal River and factors influencing levels of impact on the local people. The research study found that socioeconomic impact analysis of a large infrastructure development project provides insight into the relationship between a water body, the local people, and the local economy; it determines the portion of the population that benefits and the portion of the population that suffers the cost.

Employment and sustainability

WCD (2000) The positive socio-economic benefits of dam construction result in employment generation, welfare of the community and market accessibility. Rehman and Anis (2008) put focus on the factors that continuously decline the GDP in Azad Jammu and Kashmir due to inefficient use of hydropower projects. A comparison is provided on the socio-economic variables of Azad Jammu and Kashmir with national indicators which highlights that various mechanisms help in employment creation with the help of hydropower projects. Gurung et.al.(2011) revealed that micro hydropower projects lead to the development of rural areas and help in providing adequate facilities of electrification which ultimately supports all sections of society. Micro hydropower projects help poor people to do their work with great ease and provide them various opportunities of employment in various fields. Chandy and Shepherd (2012) explored that hydropower projects have a significant impact on the livelihood sustainability in

rural areas, for which there is dire need in changing the occupational pattern of the people. Hydropower projects have primary responsibility of creating a roadmap through which people remain engage in farm as well as non-farm occupation for their better livelihood purposes. Thapa,2015 critically evaluates how regionalized micro-hydropower projects of Nepal improve the livelihood of rural people. Pareek and Tshering (2017) analyzed that Chukha hydropower project has prominent role in infrastructural and social development of Bhutan. The study concluded that big push investment on Chuka hydropower project can generate the goal of Gross National Happiness which ultimately leads to the creation of employment opportunities with the betterment of the economic and social status of the people of Bhutan. Scott, et.al (2013) emphasize on the assessment of the employment effects of Bugoye Hydropower Plant (BHP) on household and micro enterprises as well on the entire national economy, in addition to it, the projects have wider effects of reliability, quantity and quality of power, price and access to electiricty, revenure and expernditure generated with the investment on the hydro power projects and creation of employment opportunities. The types of jobs created by BHP were direct jobs, indirect jobs, induced and displaced jobs. Bacon and Kojima (2011) also analysed from their surveys undertaken specifically for assessment of indirect and induced job creation using the input-output model and resulted the multiplier effect of employment generation due to the power projects development. International Finance Corporation (2013) observed from a review of 35 studies that energy projects have multiplier effects on employment generation on large scale and also makes comparison between indirect and induced employment creation from energy projects is larger than the direct employment creations. Robert and Masami (2011) studied the issues in estimating the employment generation by energy sector and subsector. Also emphasised on the backward and forward linkages using the multiplier analysis with survey-based estimates at the macro level. Rana B. Thapa, in his paper critically assesses how decentralized micro-hydropower projects enhances livelihood of people living in rural part of the Nepal. Major findings from the studies shows the Livelihood Enhancement through Micro-Hydro projects, the installation of each project prevails that development of micro-hydro creates a major role in employment generation in rural parts of the country. Therefore, it is concluded that development of MHPs enhances the livelihood of rural people.

III. RESEARCH GAP

Most of the past studies conducted in this area are generally related to the impact of power projects on power generation, distribution, employment creation, etc. There are a number of studies focused on the socio-economic indicators and changes in rural livelihoods influenced due to the Hydropower project construction. Based on the literature review, it was found that, there is no single research regarding the impact of the Baglihar Hydroelectric Power Project (BHP). Therefore, the present research work attempts to evaluate the impact of the construction of BHP on the local economy of village Chanderkote, district Ramban, on the aspects of employment generation, and local business creation.

IV. OBJECTIVES OF THE STUDY

- To analyze the impact of BHP on the employment generation for local community.
- To assess the impact of BHP on local business in village Chanderkote.

V. RESEARCH METHODOLOGY

The present empirical study is qualitative and quantitative. Primary and secondary sources are the two main sources of data collection. The primary data source is mainly used to explore the community perception about the impacts of BHP concerning different variables, viz. employment generation, impact on local businesses, and some related components. The qualitative research methods are used, including interviews from key informants, the village-level council, and focused group discussions, which are conducted in the study area. Officially published statistics are available from different publications, including the Economic Survey of J&K, Reports of JKSPDC Jammu and Ramban, and various other published reports, journals, books, articles, and websites. A structured questionnaire was designed to examine the perceptions of local people and to get multi-aspect information regarding the impacts of BHP. Questions asked in the interview schedule

include both open-ended and closed types, considering the objectives of the present study. The study was conducted in the village of Chanderkote, some 5km away from the Baglihar dam site. Out of the total 255 households in village Chanderkote (Census 2011), 102(40%) households were randomly selected for the field survey. In which 60 households were identified as beneficiaries and 42 households as non-beneficiary. For analyzing the impact on employment and local business creation during and after the construction phase of BHP (1999-2015), the targeted household respondents were taken into consideration and for gathering collective information from the study area, the focused group discussion was conducted. The impact analysis of the BHP was done on the basis of information collected from 60 sampled households. Simple average and percentage method is used, and data is presented with the help of tabular representation, bar diagrams and pie-charts to show the impact of BHP on different variables.

VI. DATA ANALYSIS AND RESULTS

A total of 60 beneficiary households have been identified in the sampled area, of which 27 (45%) households have been identified as those whose land was acquired by the BHP authority in exchange for compensation in cash and a job for a single member of the household. These 60 households also include other households with family members who obtained employment under BHP. The present study also identified 25 households that received benefits due to the creation of local businesses following the establishment of BHP in the village of Chanderkote. For easier analysis, the background characteristics considered include the type of family, religion of the sample households, and current income. During group discussions with villagers, it was noted that the main occupation in the affected area was agriculture. The local economy of Chanderkote is predominantly agriculture-based, with residents primarily involved in the production of crops such as paddy, wheat, and maize. The size of individual holdings is minimal, varying from 0.1 to 1.00 hectare. However, following the commissioning of the project, the BHP authority acquired both farm and non-farm land.

1. Employment generation by BHP authority for local public

Before coming up of BHP, most of the sampled households have their own source of livelihood that was farming and allied activity such as animal husbandry also called livestock farming includes poultry farming, dairy farming, fishing regarded as 'provider' (of subsistence), cattle and goats/sheep are important components of livestock, horticulture, spinning & weaving etc. This all shows the rural transformation from traditional farming activities as source of livelihood to modern infrastructural sector employment.

According to various research studies there are numerous kinds of jobs created by the Hydropower projects during and after the construction phase and on the commissioning of these projects. The kinds of jobs created are a) Direct employment, b) Indirect employment and c) Induced employment. Development of these projects may create short-term or long-term employment opportunities or both for locals and others. But during the survey, it has been observed that BHP had created direct and indirect employment opportunities for the local economy only for short term that was during the phase of construction from the year 2000 to 2015. While survey respondents gave the information that they all were employed as the temporary workers under BHP by the local contractors and very few by BHP authority directly, from the establishment of trade union in January 2003, (Chenab Hydro Power Project Worker Union, CHPPWU), all workers under the project were entitled to the social security benefits.

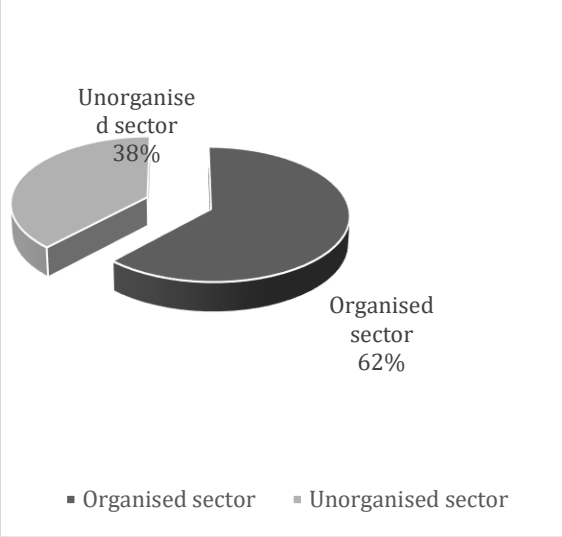
Table 5.1: Distribution of Respondents based on current income and employment generation under BHP

S. No	Income distribution (in Rs)	BHP created employment for locals				Total
		YES		NO		
		No.	%	No.	%	
1	Upto 8000	3	5	1	1.6	4
2	8000-15000	11	18.3	7	11.6	18
3	15000-25000	14	23.3	6	10	20
4	25000-50000	1	1.6	8	13.3	9

5	Above 50000	-	-	9	15	9
6	Total	29	48.3	31	51.7	60

Source: Field survey
Note: Table Shows percentage w.r.t total
Therefore, it can be concluded from the above table that out of total 60 beneficiary respondent households from the sampled area, 29(48%) affirmed that BHP created the employment opportunity for them but the majority of respondents with the percentage 31(52%) reported that they did not got any type of employment.

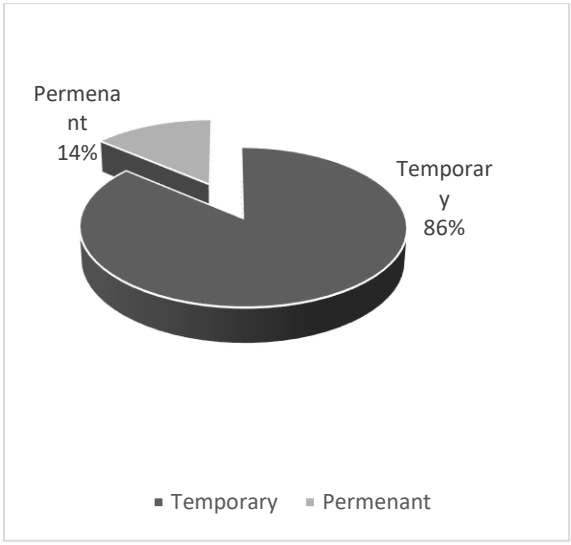
Figure 5.1: Percentage distribution of Household workers in different types of employment



Source: Field survey
The above figure clearly indicates the percentage distribution of household respondents who were employed under the BHP authority in the two types of employment sectors which are organized and unorganized sector. In nutshell, out of total 29 respondents maximum percent of workers that is 62% employed as formal sector workers and the remaining 38% respondent workers employed as under unorganized sector. Hence, the contribution of unorganized sector is also quite significant.

Type of workers employed on the basis of nature of Employment
Hired workers may further be categorized as (i)Temporary workers and (ii) Permanent workers. Temporary workers are the daily wagers who are not hired by their employers on regular basis and they are not entitled to social security benefits. Whereas, Permanent workers are on permanent pay-roll of their employers and they are entitled to the social security benefits.
While survey respondents gave the information that they all were employed as the temporary workers under BHP by the local contractors and very few by BHP authority directly, from the establishment of trade union in January 2003, (Chenab Hydro Power Project Worker Union, CHPPWU), all workers under the project were entitled to the social security benefits.

Figure 5.2: Percentage distribution of workers by the nature of Employment



Source: Field survey
Above figure portrays that out of total 29 sampled respondents, maximum number of workers 25 (86%) were temporary and the remaining 4 (14%) were permanently employed under BHP authority.
Changes in the income of Respondents (workers) employed under BHP
The changes in the income of respondents who were employed under BHP can be analyzed with the grouping of monthly income into three groups that is, a) Income of respondents in the Beginning of project (2000), b) Income on the completion (2015) and c) Current income of the respondents. It can be shown with help of given table.

Table 5.2: Distribution of changes in income of Respondents during different phases

S.No	Monthly Income distribution (in Rs)	Income in the beginning of BHP		Income on the completion of BHP		Current income of respondents	
		No.	%	No.	%	No.	%
1	Up to 5000	20	68.9	1	3.4	3	10.3
2	5000-10000	8	27.6	12	41.3	11	37.9
3	10000-15000	1	3.4	11	37.9	14	48.2
4	15000-25000	0	0	5	17.2	0	0
5	Above 25000	0	0	0	0	1	3.4
6	Total	29	100	29	100	29	100

Source: Field survey

Note: Table shows percentage w.r.t column total

It can be observed from the table that, in case of respondent income in the beginning, out of total 29 respondents, maximum 20(68.9%) were generating the monthly income up to Rs5000, 8(27.6%) had earning Rs5000-10000, and only 1(3.4%) falls under income group of Rs10000-15000 whereas no respondent falls in the income group above Rs15000. In the other case of monthly income on the completion of BHP, maximum of respondents 12(41.3%) were generating the income of Rs5000-10000, 11(37.9%) had earning the income of Rs10000-15000 and only 5(17.2%) were generating the monthly income of Rs15000-25000. At the end, in case of current income of the respondents only 3(10.3%) earning the income up to Rs5000,11(37.9%) are falling in the income group of Rs5000-10000, maximum of 14(48.2%) generating the income of Rs10000-15000 and only 1(3.4%) earning the income above Rs25000. Thus, it shows very less change of income in the different employment period in which most of the respondents on an average (41.3%) are falling in the income group of Rs5000-15000 in case of income on completion of BHP and current income.

2. Impact on local business creation

Type of local business

Self-employment in terms of local business is a significant source of livelihood for locals due to the low literacy rate and low skills for wage jobs etc. Setting up the marginal shops in the local area can be the alternative opportunity for generation of income. Due to the commencement of BHP, numerous types of local shops and businesses were opened and existing shops were expanded that resulted into the economic benefits of villagers. These shops were profited more during the summers due to the visits by tourists to the project site. Along with this, one of the main income source for native women during the project was from dealing in dairy products, to sell honey, ghee, eggs and chicken, meat, wooden material etc. The table gives the quantitative data regarding the type of local business created during the different phases of project construction.

Table 5.3: Distribution of Households on the basis of type of local business

S. No.	Type of local business to come up / expanded during different phases of BHP	No.	%
1.	Hotel & Dhaba	5	20
2.	Grocery shops & General store	5	20
3.	tools & equipment shop	3	12
4.	1&2	3	12
5.	Any other	9	36
	Total	25	100

Source: Field survey

Note:Table shows percentage w.r.t row column total

The given tabular statistics reveals that, out of total 25 household respondents, 5(20%) had set up their local business of small hotels and dhaba near the project sites, again 5(20%) households had established grocery shops and general store,3 (12%) were involved in the selling machine tools and equipment, similarly 3(12%) were dealing in both type of trading practices which are hotel, grocery shops and general

stores and the remaining 9(36%) households were involved in other businesses such as selling construction material (sand, stone, concrete and other minor material) clothes and accessories, fabrication, furniture etc.

Change in Business income and number of shops

Table 5.4: Distribution of Respondents by the change in business income, number of shops during different phases

S. No.	Particulars	No.	%
1.	Change in business income		
	a)Increase	20	80
	b)Decrease	2	8
	c)Constant	3	12
	Totals	25	100
2.	Households having the no. of shops run near BHP		
	a)Only one	16	64
	b)2-5 shops	6	24
	c) Above 5	3	12
	Total	25	100
3.	Establishment of local business during different phases		
	a)Before BHP	5	20
	b)During construction phase	14	56
	c)Before & During (a & b)	2	8
	d)After commissioning of BHP	4	16
	Total	25	100

Source: Field survey

Note: Table shows percentage w.r.t column total

Above table depicts that there were majority of households that is 20(80%) observed increased income, 2(8%) fall in income, and 3(12%) the income remain constant. Other than that, maximum 16(64%) of households were operating their one shop each near the BHP, 6(24%) had the number of shops ranging 2-5 and remaining 3(12%) had number of shops above 5. It can also be seen from the table that, out of total, 5(20%) households had set up their shops before the project initiated, maximum 14(56%) households set up their shops and units during the beginning of construction work of project, 2(8%) had introduced some shops before and during the project construction and the remaining 4(16%) households commenced their local business after commissioning of the project.

Major findings

- It was found that the majority of those who benefited from employment in the company include the daily wagers and less educated youth who were given unskilled jobs, mostly the temporary nature jobs at construction site of BHP. Whereas the educated youth were employed in the offices and doing the variety of skilled jobs.
- One of the noticeable point was that not a single female worker was employed under the project from the local community.
- It was also found that BHP results into positive impacts on tourism for the local business such as hotels and dhabas. Tourism arises from increased visits to dam site, to observe engineering or the reservoir.
- Study reveals that during construction phase, households in village put their houses on rent to the employees and workers of BHP due to which additional income was generated and they got economic benefits.
- In terms of local area development program with respect to CSR, Hydro power company undertakes certain community development projects such as construction of roads and footpaths, security blocks and buildings. During construction, no formal CSR initiatives were taken by the project authority, in the name of CSR, Jaiprakash Associates Limited (JAL) had built the 2 to 3 rooms for the school in Chanderkote, just to please locals.

Observations Based on Focused Group Discussion

- BHP had provided the monetary and non-monetary incentives to their workers who worked on the construction site and under the tunnel during the construction phase such incentives consists of winter allowances, tunnel allowances, travelling allowances and transport facilities.

BHP also gives the provision of medical facilities for the family members of the staff in the campus hospital of BHP, the medical facilities for locals were given in the hospital during the construction period only and discontinued after the completion of the project. The staff members got public health care services till JAL was in the area of construction. The company also had the provision of education allowances for the children of the employees working under the project and labour commission facilitates some assistance for education of their children. The project-associated company opened the schools by the help of locals and they also employed the teaching staff who got remuneration through company.

- It was observed during discussion with respondents that the project authority also has the provision of canteen and mess facilities, housing accommodation for permanent and temporary staff members but not for daily wagers. In addition to the above, for the safety of workers safety tools and equipments were provided during their working hours such as helmet, safety boots, jackets and other safety equipment. It was noticed that after the establishment of trade union (Chenab Hydro Power Project Worker Union) in 2003 the various favorable changes took place due to the constant endeavor of the trade union in terms of social security benefits to the workers employed under the project directly or indirectly. It includes the provision of an annual increment on basic pay. After every 5 years staff got monetary incentives based on title and position in their respective department, but very few employees got a job promotion during construction phase.
- There was the provision of insurance of workers through company, In addition, the project authorities had gave the employment provision to the family members of deceased employees who lost their lives during working hours and disabled employees got the compensation according to their disabilities. But at the same time family members had to face the official apathy while getting compensation against the deceased worker of company.
- With regard to the skill development the project authority had avail training facilities and skill development opportunities to the workers in their respective departments. The study also reveals that the companies associated with BHP imparted the skills by training local people for technical jobs such as pump fitter, JCB operator, steel fitter, electrician etc. No authority was assigned to the local contractors to engage tradesman and technical workers in the project company.
- It was noticed that the most of the workers enrolled in the project merely for temporary period and at the same time, positively very less young generation was unemployed whether skilled or unskilled. It was perceived that illiterate and unskilled workers were motivated to pursue for higher studies; they got training in the project and become skilled personnel.
- Along with the numerous positive and desirable effects, the BHP had led to some negative impacts on the local economy, which consisted of a change in culture and tradition, which increased evils and bad habits. Youngsters became drug addicted due to the bad company of workers from outside who were employed in the project, as they were involved in drinking, consuming weed, etc.

VII. SUGGESTIONS AND POLICY IMPLICATIONS

- Jobs provided by the hydroelectricity companies to villagers have temporarily solved some unemployment problems but do not provide long-term economic security. There is a need for policy and investment mechanisms that build capacity among villagers to engage in diverse livelihood activities, both farm and non-farm.
- The complete reliance on temporary company work is a risk to the sustainability of the villagers and livelihoods thus the government should make such provisions while implementing these types of Hydropower projects and involvement of associated companies to create long-term employment opportunities for the local economy.
- The companies involved in these kinds of projects must introduce some monetary and non-monetary provisions for their workers against their accidental damages that occurred during construction work, repair and maintenance of plant and machinery, etc.

- There should be the implementation of proper mechanisms, performance standards and business ethics to be followed by the companies which are involved in the hydropower projects in order to perform the CSR towards its different stakeholders in the community (including members, employees, government) such as infrastructure development programs, conducive working environment to the workers, skill development, conserving environment, etc.

VIII. SUMMARY AND CONCLUSION

The development of this substantial hydroelectric potential enables the State to offer local and regional solutions in the short- and medium-term concerning employment and economic development, initially during the construction phase of such projects and subsequently for the maintenance and operation of the workforce and the power system. This project has both positive as well as negative impacts on the local economy. Thus, it is concluded that the employment opportunities provided by BHP Company have played a vital role in helping local residents tackle their unemployment challenges albeit only temporarily. Following the establishment of BHP, a variety of local shops and businesses began to open, while existing shops expanded, bringing notable economic benefits to the community. Along with the BHP company, the government should also actively shape policies and guide corporate social responsibility (CSR) funds from the corporate sector.

REFERENCES

[1] Adhikari, S. D. (2014). Socio-Economic Impact of Micro-Hydro Project. Tribhuvan University.

[2] Arora, D. S., Busche, S., Cowlin, S., Engelmeier, T., Jaritz, J., Milbrandt, A., & Wang, S. (2010). Indian renewable energy status report: background report for DIREC, National Renewable Energy Lab. (NREL), (United States).

[3] Atindana, S. A., Mensah, P., Alhassan, E. H., Ampofo-Yeboah, A., Abobi, S. M., Akongyuure, D. N., & Abarike, E. D. (2015). The socio-economic impact of Bui Dam on resettled communities; A case study of Lucene and Agbegikuro communities in the Northern Region of Ghana. UDS International Journal of Development, 2(1), 45-51.

[4] Atiq-ur-Rehman, A. U. R., & Anis, H. (2008). Impact of Hydropower Projects on Economic Growth of AJK.

[5] Bacon, R., & Kojima, M. (2011). Issues in estimating the employment generated by energy sector activities.

[6] Bird, E. (2012). The Socioeconomic Impact of Hydroelectric Dams on Developing Communities: A Case Study of the Chalillo Dam and the Communities of the Macal River Valley, Cayo District, Belize, Central America.

[7] Biswanath Ray (2001), Socio- Economic Development in India, Mohit Publications, New Delhi.

[8] Brown, P. H., Magee, D., & Yilin, X. U. (2008). Socioeconomic vulnerability in China's hydropower development. China Economic Review, 19(4), 614-627.

[9] Butt, T. I. (2012). Development and displacement in Chenab valley after construction of power project at Kishtwar. THE COMMUNICATIONS, 10(1), 97.

[10] Cernea, M. M. (2004), Social impacts and social risks in hydropower programs: Preemptive planning and counter-risk measures. In Keynote address: Session on social aspects of hydropower development. United Nations Symposium on Hydropower and Sustainable Development Beijing, China.

[11] Chandy, T., Keenan, R. J., Petheram, R. J., & Shepherd, P. (2012). Impacts of hydropower development on rural livelihood sustainability in Sikkim, India: Community perceptions. Mountain Research and Development, 32(2), 117-126.

[12] Coalition, E. (2010). Economic impact of the electrification roadmap. Document available online at http://www. electrificationcoalition. org/media/EC_ImpactReport. pdf.

[13] De Faria, F. A., Davis, A., Severnini, E., & Jaramillo, P. (2017). The local socio-economic impacts of large hydropower plant development in a developing country. Energy Economics, 67, 533-544.

[14] Dos Santos, E. S., Da Cunha, A. C., & Cunha, H. F. A. (2017). Hydroelectric Power Plant in The Amazon and Socioeconomic Impacts on

Fishermen In Ferreira Gomes County–Amapá State. Ambiente & Sociedade, 20(4), 191-208.

[15] Dudhani, S., Sinha, A. K., & Inamdar, S. S. (2006). Assessment of small hydropower potential using remote sensing data for sustainable development in India.Energy policy, 34(17), 3195-3205.

[16] Government of Jammu and Kashmir (2017). District Census Handbook Ramban (2016-17). Directorate of Economics and Statistics, Jammu and Kashmir.

[17] Government of Jammu and Kashmir (2018). Digest of Statistics (2016-17). Directorate of Economics and Statistics, Jammu and Kashmir.

[18] Gurung, A., Bryceson, I., Joo, J. H., & Oh, S. E. (2011). Socio-economic impacts of a micro-hydropower plant on rural livelihoods. Scientific Research and Essays, 6(19), 3964-3972.

[19] ICEM, A. (2010). MRC Strategic Environmental Assessment (SEA) of hydropower on the Mekong mainstream. Hanoi, Viet Nam, ICEM, Australia.

[20] Jetli, and Sethi. V (2007). Infrastructure Development in India, New Century Publications, New Delhi.

[21] Juchau, C., & Solan, D. (2013). Employment estimates in the energy sector: concepts, methods, and results. Juchau, C. & Solan, D. Energy Policy Institute.

[22] Katoch, A., Guleria, J., & Kumar, A. (2014). Impact of Nathpa Jhakri Hydroelectric Power Project on the environment and livelihood in Kinnaur and Shimla Districts of Himachal Pradesh. Indian Council of Social Science Research.

[23] Kesa, L. (2014). Hydropower Development, Economic Growth and Social Equality: Mekong Region. S. Rajaratnam School of International Studies.

[24] Keskinen, M., Kummu, M., Käkönen, M., & Varis, O. (2012). Mekong at the crossroads: Next steps for impact assessment of large dams. Ambio, 41(3), 319-324.

[25] Koschel, H. (2013). Energy and Employment: Case Study Hydropower in India. KFW Position Paper.

[26] Lipscomb, M., Mobarak, A. M., & Barham, T. (2013). Development effects of electrification: Evidence from the topographic placement of hydropower plants in Brazil. American Economic Journal: Applied Economics, 5(2), 200-231.

[27] Ministry of Finance, Government of India (2018). Economic Survey 2017-2018.

[28] Namy, S. (2007). Addressing the social impacts of large hydropower dams. The Journal of International Policy Solutions, 7, 11-17.

[29] Onuonga, S. M. (2012). The relationship between commercial energy consumption and gross domestic income in Kenya. The Journal of Developing Areas, 305-314.

[30] Pollin, R., Heintz, J., & Garrett-Peltier, H. (2009). The Economic Benefits of Investing in Clean Energy: How the economic stimulus program and new legislation can boost US economic growth and employment (No. economic_benefits). Political Economy Research Institute, University of Massachusetts at Amherst.

[31] Sanunnaam, N., Sajjakulnukit, B., & Songprakorp, R. (2012). Techno - socio - economic Assessment of Pico Hydropower Installations in the Northern Region of Thailand. International Conference on Environment Science and Engieering.

[32] Sastresa, E. L., Usón, A. A., Bribián, I. Z., & Scarpellini, S. (2010). Local impact of renewables on employment: assessment methodology and case study. Renewable and sustainable energy reviews, 14(2), 679-690.

[33] Scott, A., Darko, E., Seth, P., & Rud, J. P. (2013). Job Creation Impact Study: Bugoye Hydropower Plant, Uganda. Overseas Development Institute, London. http://www. odi. org/sites/odi. org. uk/files/odi-assets/publications-opinion-files/8436. pdf.

[34] Shome, S., & Roy, N. C. (2018), Socioeconomic & Environmental Risk Impact of Hydro Power Projects in Uttarakhand

[35] Sterzinger, G. (2006). Jobs and renewable energy project. Renewable Energy Policy Project.

[36] Tilt, B., Braun, Y., & He, D. (2009). Social impacts of large dam projects: A comparison of international case studies and implications for best practice. Journal of environmental management, 90, 249-257.

[37] Tshering, D., & Pareek, S. K. (2017). Social Impact of Chukha Hydro Power on its Local Population in Bhutan. International Journal for Innovative Research in Science & Technology, 4(5), 85.

[38] Von Sperling, E. (2012). Hydropower in Brazil: Overview of positive and negative environmental aspects. Energy Procedia, 18, 110-118.

[39] World Commission on Dams. (2000), Dams and Development: A New Framework for Decision-making.