Received Date: Oct. 2022 Revised: Nov. 2022 Accepted: Dec. 2022

Rural Electrification: Prospects, Challengesand Role of Community for Bulk Buying Method in Rural Municipality of Lalitpur District.

Pradip Parajuli, *PhD*
Associate Professor, Tribhuvan University
parajulisp@hotmail.com
Ayush Joshi., *M.A*
Rural Development
Doi : https://doi.org/10.3126/ppj.v2i2.52913

Abstract

Rural electrification is the process of bringing electrical power to rural and remote areas. Bulk buying method in rural electrification is when a licensed organization (cooperative in this case) buys electricity from NEA in bulk in cheaper price and distributes it to rural areas in normal prices. The profit generated will be used in the maintenance and expansion of the electric grid lines. The profit is also used in different awareness programs and uses of electricity. The Rural electrification via bulk buying method is a new type of rural electrification process. Despite this being used in some parts of Nepal from 2061 BS, it is not a wide spread process and people don't know about it. The objective of this study is to find out about the benefit of this method over other electrification methods like solar, small hydropower plants. The different difficulties and hinder and faced by the rural population as well as the organizations trying to implement this process. The role of the community in the implementation and sustainability of this process and how it will impact their life.

This methodology focuses on answering questions relating to "what" than the "why" of rural electrification. Descriptive as well as analytical methods are being used. Observation of the place and who the bulk buying method is being used and survey of the people was done for Descriptive method. Analysis method refers to the process of analyzing survey results from universe of the study.

Rural areas are very isolated and the communities there have very different lifestyles than those of us living in urban areas where electricity is given. Rural electrification with the use improves individual's quality of life, enables community services such as health and education (consumption use) and enables business entities to carry out professional activities (productive use) for rural populations. All of these benefits are possible without creating unintended negative consequences for local ecosystems and the global climate. Some people don't believe that this process is good for these communities, but the advantages clearly show that electrification will benefit them and improve their quality of life.

Keywords: Rural, electrification, bulk buying method, bulk in cheaper price & distributes in normal prices

Introduction

Energy is: "the golden thread that connects economic growth, social equity and an environment that allows the world to thrive." as described by UN Secretary General, Ban-Ki-moon. Hence, for a country and its people to prosper, electrification plays an important role. Rural electrification is thus key for the socio-economic development of non-urban regions in developing and emerging countries.

Rural areas can be very isolated and the communities there have very different lifestyles than those of us living in urban areas where electricity is given. Rural electrification with the use of renewable energies or hybrid systems improves individual's quality of life, facilitates community services such as health and education (consumption use) and enables business entities to carry out professional activities (productive use) for rural populations. All of these benefits are possible without creating unintended negative consequences for local ecosystems and the global climate. Some people don't believe that this process is good for these communities, but the advantages clearly show that electrification will benefit them and improve their quality of life.

Given its substantial benefits, electrification (along with access to other sources of modern energy) has been identified as essential for fulfilling MDGs. The World Bank views electrification as an integral part of development and has supported electrification projects in many developing countries.

Although there have been many general studies on rural electrification as it relates to development, there have not been many systematic impact studies of particular rural electrification projects and this includes Nepal too.

The electrification project started from 2061 BS Bhadra 2nd. At first 10/90 program was started where the government would give 10 percent subsidy and the cooperative (project) would keep 90 percent for the infrastructure for the electrification. And then 80/20 program started followed by 50/50 and now it is 10/90 where the government pays 90 percent of the infrastructure and 10 percent is paid by the cooperative. As the budget of the Nepal does not allocate a title "electrification" after consulting with the rural municipality the money used for the project is shared from other titles like education, health.

Rural Electrification means the distribution of electricity to the rural areas. Bulk Buying method is also known as grid extension method. The licensed cooperation buys electricity from NEA in a cheaper price in bulk and sells it to rural areas.

South Lalitpur rural electric cooperative Ltd. (SLREC) is responsible for collecting the payments of electric use and maintenance of the equipment required to run the rural electrification project in Gotikhel.

SLREC uses total of 11 TOD meters and 3 feeder lines to transport electricity to 3 rural municipalities with 7000 households. Gotikhel, MahankalGaunpalika is one of the villages under SLREC where 5 transformers (Lower Center) are located. A local Technician Mr.

SanadParajuli collects the payment from the individual houses from Gotikhel. Total of 400 household uses the electricity from Gotikhel.

Rural electrification is a process by which households or villages located in rural, isolated or remote regions of a country is provided with access to electricity. It has become a top priority in Nepal, and in order to expand the access of electricity services to rural areas on a demand driven approach, since 2003, the Government of Nepal has implemented the Community Rural Electrification Programme (CREP). This has opened door for the community-based organizations to buy electricity in bulk from NEA and sell it within its area by utilizing the existing or newly constructed distribution networks. The established of CREP by the government is an essential step towards the development of rural electrification that will address the problems associated with building infrastructures and providing electricity facilities to the people of the region.

Today, there are approximately 1.5 billion people in the world living without access to electricity. This corresponds to approximately 25% of the world's population. A significant majority of these people live in rural areas. Instead of electricity, people in these regions use traditional biomass for heating and cooking, which both increases CO2-emissions as well as have a negative impact on health. In Nepal, 80 % of the energy consumption is based on traditional biomass, mostly consisting of firewood.

Electricity theft is another huge problem faced by Nepal's electricity providers. Though the government is trying its best towards maintaining the order by launching different campaigns to control electricity theft, few have found ways around the system. "Locals have been stealing electricity by attaching wires to overhead transmission lines, tampering with the electricity meter, and in some case, disconnecting the meter," said, chief of the Lagankhel Distribution Centre.

Objectives of the Study

The broad objective of this study is to examine bulk buying method in the study area. However, the study has some specific objectives. They are:

- To explore the benefits of rural electrification to the people through bulk buying method.
- To understand the prospects and challenges of rural electrification and role of community.

Research Methodology

This study was based on exploratory and descriptive research design which is carried out in Mahankal Rural Municipality of Lalitpur Districtof Bagmati Province of Nepal. All together 40 house-holds were selected purposively. The nature of data is qualitative as well as quantitative and sources of data are based on primary sources. Interview schedule and observation were done for data collection technique. The collected data were classified according to its nature and characters.

Respondents Profile

The demographic characteristics include age, sex, and marital status of the respondents. Results as shown in Table 1 revealed that out of 40, Majority of the respondents are in the age group of 20-45, 26 (65%). Only 12 respondents (30%) were in the age group of below 19, the minority of the respondents are in the age group of above 45, 2 (5%). The majority of the respondents are male, 26 (65%) and only 14 respondents (35%) are female. More than half of the respondents 24 (60%) are married. Only 12 respondents (30%) are unmarried. Only a few respondents from the group of divorce, 4 (10%).

Table 1: Socio Demographic Profile of the Respondents

Socio-demographic profile		Frequency	Percentage
Age group	Below 19	12	30
	20 to 45	26	65
	45 above	2	5
Sex group	Male	26	65
	Female	14	35
M. status	Married	24	60
	Unmarried	12	30
	Divorce	4	10
Caste/ethnicity	Brahmin	8	20
	Chhetri	8	20
	Damai/ Kami/Sarki	4	10
	Gurung/Magar/Tamang	14	35
	Newar	6	15
Religion	Hindu	20	50
	Buddhist	13	32.5
	Christian	7	17.5
Education	Illiterate	8	20
	Up to school level	26	65
	Higher education	6	15
Occupation	Agriculture/ animal husbandry	21	52.5
	Wage labour/ household work	8	20
	Service/ business/ industries	11	27.5
Economic Status of family	Not enough	20	50
	Enough	12	30
	Surplus	8	20

Source: Field Survey, 2021

Along with these demographic characteristics, caste/ethnicity, religion, education, occupation, and family economic status of respondents were taken as socio-economic status. The above table shows that majority of the respondents were from the caste/ethnic group Gurung/Magar/Tamang, 14 (35%). 8 (10%) respondents respectively Brahmin and Chhetri,

6 (15%) respondents were Newar and only a few respondents were from the Damai/Kami/Sarki ethnic/caste group, 4 (10%). Half of the respondents were from the Hindu religion, 20 (50%), Buddhist religions were 13 (32.5)and only a few respondents are from the Christian religion, 7 (17.5%). With the majority of 26 (65%) belonging to up to school-level education. Among them 8 (20%) respondents were literate and only a few 6 (15%) of them were of higher education. More than half of respondents, 21 (52.5%) were involved in agriculture/ animal husbandry, 11 (27.5%) respondents were involving in service/business/ industries, and the rest only a few 8 (20%) were involved in wage labor/ household domestic work. Among the respondent's family economic status 20 (50%) were lower, 12 (30%) were in the middle and only a few 8 (20%) were in the economically high class.

Prospect, Challenges and Role of Community

The Prospects, challenges and Role of the community are the mode of payment for electricity bill, the blackouts and power cuts faced by the respondents, the high maintenance cost of the bulk buying method due to landslides or accidents, the knowledge of the electrification process by the people, probability of the electricity theft in the locality and the opinions of the habitants on the electrification cooperatives.

Mode of payment for electricity bill

As the Cooperative is responsible to collect the payments as per the unit used the result should be 100% for the per KWH used however due to some households giving rent to people the result is different.

Table 2: Mode of payment for electricity bill

Household paying method for electrical service	
Mode of Payment	Percentage
Per KWH used (number of units consumed shown in the meter)	80%
By the number of bulbs, fluorescent tubes or electrical apparatuses	10%
Fixed charge or flat rate	10%
Others	0%

Source: Field Survey, 2021

The above table clearly illustrates the percentage of mode of payment practiced by the people. Out of 40 respondents, 80% pay by per KWH, 10% by the number of bulbs, fluorescent tubes or electrical apparatuses,10 % by fixed charges and 0% by other mediums.

Households experiencing electricity cuts/blackouts

Table 3: Experiencing electricity cuts/blackouts

S. No.	Experience	Frequency	Percentage
1	Often	4	10%
2	Rarely	36	90%
3	Never	0	0%
	Total	40	100%

Source: Field Survey 2021

The above table shows that, 90% of residents are happy that they have rarely faced the power-cuts however 10% of residents are still often faces power-cuts in their locality.

Bulk buying electricity in rural areas

Bulk buying electricity is not a famous practice in Nepal, especially in rural areas. Many people haven't even heard of it and even those who are little aware of it and using it by neighboring person's advice, suggestions or simply using it because the person living next door is using it don't know its actual benefits or importance and thinks it's a rigorous process after a while.

Table 4: Bulk buying electricity in rural areas

Specifics	Yes (Percentage)	No (Percentage)
Electricity Bulk Buying method in rural areas is a problem because of its high maintenance cost.	70%	30%

Source: Field Survey, 2021

The above table clearly illustrates that 70% of the respondents thinks that bulk buying electricity in rural areas is a problem because of its high maintenance cost and only 30% think otherwise.

Knowledge of electric distribution process in locality

Table 5: Knowledge of electric distribution process in locality

Specifics	Yes (Percentage)	No (Percentage)
Knowledge of electric distribution process in people of study area	70%	30%

Source: Field Survey, 2021

The above table illustrates the percentage of people having knowledge of electric distribution process. Since, electricity itself is a technical issue and one needs to take trainings to have the knowledge; 70% of the people have the knowledge of distribution process and remaining 30% don't have it.

Probability of electricity theft in the locality

Table 6: Probability of electricity theft in the locality

Specifics	Yes (Percentage)	No (Percentage)
Probability of electricity theft in the locality like stealing meters, wires, disconnecting meters, bypassing meters and using hooks	0%	100%

Source: Field Survey, 2021

The above table clearly demonstrates the percentage of electricity holdup. In the underdeveloped countries like Nepal and in rural areas there is always a possibility of electricity theft like stealing meters, wires, disconnecting meters, bypassing meters and

using hooks, however 0% percentage of electricity theft has been seen in the study area which is a good sign.

Findings

- The majority of the respondents are in the age group of 20-45, 26 (65%). Only 12 respondents (30%) were in the age group of below 19, the minority of the respondents are in the age group of above 45, 2 (5%).
- The majority of the respondents are male, 26 (65%) and only 14 respondents (35%) are female.
- More than half of the respondents 24 (60%) are married. Only 12 respondents (30%) are unmarried. Only a few respondents from the group of divorce, 4 (10%).
- The majority of the respondents were from the caste/ethnic group Gurung/Magar/Tamang, 14 (35%). 8 (10%) respondents respectively Brahmin and Chhetri, 6 (15%) respondents were Newar and only a few respondents were from the Damai/Kami/Sarki ethnic/caste group, 4 (10%).
- Half of the respondents were from the Hindu religion, 20 (50%), Buddhist religions were 13 (32.5)and only a few respondents are from the Christian religion, 7 (17.5%).
- With the majority of 26 (65%) belonging to up to school-level education. Among them 8 (20%) respondents were literate and only a few 6 (15%) of them were of higher education.
- More than half of respondents, 21 (52.5%) were involved in agriculture/ animal husbandry, 11 (27.5%) respondents were involving in service/business/ industries, and the rest only a few 8 (20%) were involved in wage labor/ household domestic work.
- Among the respondent's family economic status 20 (50%) were lower, 12 (30%) were in the middle and only a few 8 (20%) were in the economically high class.
- Mode of payment practiced by the people, out of 40 respondents, 80% pay by per KWH, 10% by the number of bulbs, fluorescent tubes or electrical apparatuses,10 % by fixed charges and 0% by other mediums.
- 90% of residents are happy that they have rarely faced the power-cuts however 10% of residents are still often faces power-cuts in their locality.
- 70% of the respondents thinks that bulk buying electricity in rural areas is a problem because of its high maintenance cost and only 30% think otherwise.
- 70% of the people have the knowledge of distribution process and remaining 30% don’t have it.
- 0% percentage of electricity theft has been seen in the study area which is a good sign.

Conclusions

The bulk buying method which is running in South Lalitpur is doing a commendable job by providing electricity in rural areas; electricity would be easily accessible even now if the cooperatives like SLREC would not have stepped in. The people of the study area seemed quite aware of the bulk buying method and were very happy with how the project was running. With different trainings provided by SLREC it has resulted in women empowerment as well because now women are actively involved in income generating activities. With access to electricity there living slandered has also drastically improved.

As some of the households in villages are not in dense areas it is still more expensive to connect them with electricity through bulk buying method. The investment needed to install

electricity to few households which are far from transmitters is extremely high that is why for some households the electrification method like solar is more effective in these instances.

It seems that the main problem of electrification through bulk buying method is Nepal's geographical condition. Unpredictable Natural disasters cause more maintenance work in the project resulting in longer power cuts. We can also see that the entire household in study area either have or are trying to have electricity access because people are aware of benefits of having electricity. It has become easier to pay for the electric use and the dependency on the technician to collect the payments has decreased.

I was also quite surprised that there was no electric theft in the locality like staling meters, wires, disconnecting meter, bypassing meter and using hooks. Despite many challenges the electrification through bulk buying method is very effective. If done properly it can be applied effectively in other rural areas also.

References

Asian Development Bank. (2011, December). *Nepal: Rural Electrification, Distribution, and Transmission Project* (No. 29471–013). https://www.adb.org/sites/default/files/project-document/60141/29471-013-nep-pcr.pdf

Basnet, R., Tiware, S., Waligora, R., Pradhan, B., & Schmitz, T. (2020). *Nepal Energy Situation - energypedia*. Energypedia. https://energypedia.info/wiki/Nepal_Energy_Situation

Becker, T., & Michel, A. (2019). *Community Rural Electrification Programme (CREP) Nepal - energypedia*. Energypedia. https://energypedia.info/wiki/Community_Rural_Electrification_Programme_(CREP)_Nepal

Community Electricity Distribution Bye Laws, Nepal Electricity Authority. (2060). https://www.nea.org.np/admin/assets/uploads/supportive_docs/Community%20Electricity%20Distribution%20Bylaw.pdf

Gham Power Nepal Private Limited. (2020, January 13). The Alliance for Rural Electrification (ARE). https://www.ruralelec.org/business-opportunities/gham-power-nepal-private-limited

Nepal Electricity Authority. (2019, August). *Distribution and Consumer Service Directorate*. Ramji Bhandari.

Palit, D. ,&Chaurey, A. (2013). *Rural Electrification Through Decentralised Off-grid Systems in Developing Countries*. Subhes Bhattacharyya. https://doi.org/10.1007/978-1-4471-4673-5

Renewable Energy for Rural Livelihood | UNDP in Nepal. (2019). UNDP. https://www.np.undp.org/content/nepal/en/home/projects/rerl.html

SLREC. (2020). *South Lalitpur Rural Electric Cooperative Annual Report*.

Trace, S. (2021, April 22). *Electricity distribution in rural Nepal | EEG*. Energy and Economic Growth.
https://www.energyeconomicgrowth.org/blog/electricity-distribution-rural-nepal

Wikipedia contributors. (2021, November 2). *Rural electrification*. Wikipedia. https://en.wikipedia.org/wiki/Rural_electrification