ISSN: 3065-0437

Columbia Journal of Engineering and Technology

Research Article

RURAL ELECTRIFICATION IN UGANDA: EXPLORING THE CHALLENGES AND OPPORTUNITIES IN SANGA SUB-COUNTY

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Abstract

Access to electricity is crucial for community development, particularly in rural areas where electricity is often unreliable or nonexistent. This paper provides a comprehensive overview of the electricity sector in Uganda and analyzes the challenges facing rural communities in gaining access to electricity. The paper presents two case studies on Rural Sanga Sub County and Sanga Town Council and examines linkages between electricity access and communities' strengthening. The study reveals that electricity access significantly improves all indicators of communities strengthening and suggests that electric energy access can be significant for policymakers aimed at improving communities for social transformation. The paper is based on information obtained through site visits, area appraisals, interviews with key informants, and general observation. The challenges facing the electricity sector in Uganda include power theft, insufficient supply, geographic isolation, high infrastructure costs, and market failure. The burden is placed both on the consumer, who must cope with frequent outages and increased tariffs, and the providers, who face difficult financial and infrastructural challenges. This paper contributes to the literature on electrification in developing countries and provides relevant information for policymakers aimed at improving access to electricity in rural communities.

Keywords: Electricity access, rural communities, developing countries, Uganda, electrification, social transformation.

INTRODUCTION

Access to electricity has become increasingly important in today's world as it has transformed communities by empowering them financially through different activities that generate income (World Bank, 2015). While developed countries have come to take utilities like electricity for granted, the absence of electrical utilities greatly impacts the lives of residents in the developing world, particularly rural communities. In fact, today, 770 million people still lack access to electricity and hundreds of millions live with unreliable access to it (IEA, 2016). Rural communities, especially commercial centers, have a genuine and justifiable need for electricity (REA, 2018). These communities want to use electricity in relatively small quantities to pump water, transport commodities, engage in income-generating activities, practice modernized healthcare, and increase available light to extend work and leisure hours. However, the road to achieving electrification is complex and costly. A typical scenario in a developing country may look like this: Large power companies are supported by government either through state ownership or by obtaining government-issued bids and are typically integrated

vertically (Lee, 2016). Power theft accounts for huge losses and collection rates are low. Market failure, a scenario in which a desirable commodity (here, electricity) is not supplied at a level that meets demand, exists prevalently, as demand for electricity exceeds production capacity. The burden is placed both on the consumer, who must cope with frequent outages and increased tariffs, and the providers, who face difficult financial and infrastructural challenges. Uganda is a developing country with a large rural population and an electricity sector that is in flux. Since the passage of the 1999 Electricity Act, private enterprise has been introduced into all aspects of the sector. However, problems with power theft, insufficient supply, geographic isolation, and high infrastructure costs have inhibited rural communities from gaining access to electricity (RESP, 2013). As a result, the policy in Uganda has been to give electricity to those communities that are progressively gainful and all the more densely populated, but to encourage all households to connect to the grid once it is accessible in the community (Benard, 2012). To address these issues and uncover some of the major challenges of making electricity accessible in Uganda, this paper attempts to provide a comprehensive overview of the electricity sector in Uganda, with foundational information that is necessary for a full understanding of the electricity situation. This paper is based on information obtained through site visits, area appraisals, interviews with key informants, and general observation.

Specifically, this paper presents two case studies: Rural Sanga Sub County and Sanga Town Council, examining their challenges as far as electrification is concerned. In addition, this paper analyzes the linkages between electricity access and communities' strengthening by investigating whether development in financial results also norms from change gender standards and practices inside the family unit, which remains unclear (Kaijuka, 2017). This study reveals that electricity access improves all indicators of communities strengthening. The results show that income and assets values are higher in households with electricity access compared to households without access to electricity, the total hours used up in those home-based accomplishments are less for households with electricity access compared to households without access to electricity, and households with electricity access are more likely to use contraception methods. This study suggests that electric energy access can be significant for policy makers aimed at improving communities for social transformation.

2. MATERIALS AND METHODS

2.1 Description of area of study

The study was conducted in Sanga rural and Sanga Town Council communities surrounding Lake Mburo National Park, Kiruhura District, Nyabushozi County in Ankole sub region Western

Uganda. Sanga is located approximately 36 kilometers east of Mbarara the largest city in the Ankole sub-region. This is approximately 31 kilometers west of Lyantonde, the nearest large town, along the Masaka- Mbarara Highway as shown in Figure 1 below.

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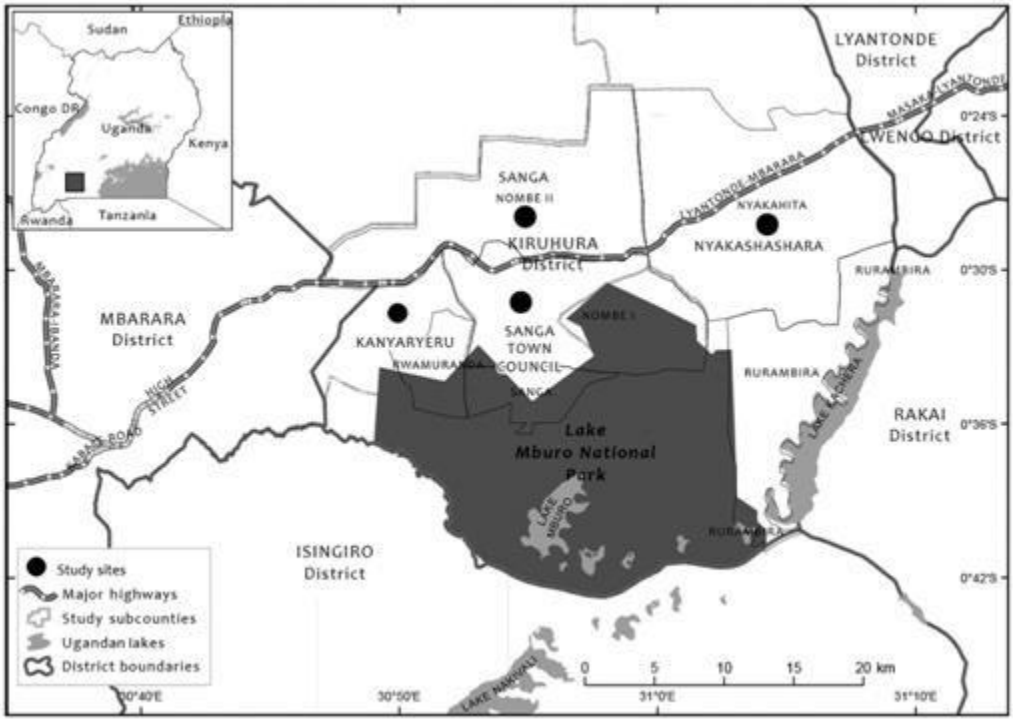

Figure 1: Map showing study area in Kiruhura District covering Sanga Sub County and Town Council.

2.2 Methods

2.2.1 Study design and data collection

The study applied an exploratory research design in which face-to-face questionnaire interviews with households/respondents were applied in data collection. Households/respondents were randomly selected from two case studies, each contributing at least 103 households. The two case studies were derived from a population of 4 Sub Counties based on a sample size calculation using a 95% confidence level and a 20% Margin of Error. To be eligible for the study, a household had to have at least one adult resident who knew electricity or has lived in the area for more than 10 years. The questionnaire interviews were conducted on an individual basis to minimize peer influence. In total 207 respondents were interviewed. The questions covered in the questionnaire focused on: (i) general household characteristics such as gender, age group, ownership of land, level of education and main source; (ii) household incomes; (iii) organization membership; (iv) source of livelihood; and (v) uses of electricity.

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2.2.2. Data Analysis

Quantitative data was entered into a database and exported to an SPSS dataset for analysis. Themes related to the study objectives were identified and formed the codes to be used in the analysis. Data were analyzed using descriptive and inferential statistics generated in SPSS 17.0. Summary statistics, for example the mean, frequency, percentages, and totals were generated to show the number of households, which responded to each variable of interest. The relationship between dependent variable (i.e., vulnerability to food insecurity) and the independent variables (i.e., socio-economic and demographic characteristics of households among other categorical variables) was determined using a Pearson's Chi-square (χ 2) statistics at5% level of significance.

3. RESULTS

3.1. Description of Respondents

The majority (57.7%) of respondents were males which is not surprising, given that in the study area the patriarchy social system dominates. This has implications for the ownership of/or access to productive assets like land in the agriculture sector amongst other economic activities. The decisions on what type of business to do, plants/crops to be cultivated on the land and the acreage to be cultivated for a crop, even for the type of food security crops, is mainly made by males. This is likely to negatively affect household earnings since males are mainly interested in businesses that earn huge money which may not be possible within a short time. It was also observed that a majority (87%) of the respondents were below the age of 60 years. This suggests that they have a high interest in business ventures and a need to organize themselves for better outcomes. Over 72% of the respondents were smallholder farmers, and for most (76.4%) of them, it was their major source of income. Very few households earn their income from salaries/wages (6.7%) and trade (9.1%). This dependence on smallholder agriculture that is rainfed for food and income makes them more vulnerable to impacts of climate variability and change. Although 54.5% of the households reported to rear livestock, they mostly owned one or two goats or cows. And those who kept it, did it mainly for trade (62.4%), breeding (17.7%), and consumption (13.7%) among other reasons.

As for education, 67.5% of the respondents had attained at least some level of education. Of these, 9.3% attained primary education and 37.9% had advanced to secondary school level education. However, the percentage of those who had advanced beyond secondary school level (i.e., university, tertiary, institute etc.) was relatively low, and they had also not gained training in any other specialties (e.g., agriculture).

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Table 1: Socio-demographic characteristics of respondents in percentages

Descriptive	Sub County	Percentage %
	Rural Sanga	44.6
	Sanga Sub County	**50.4**
Gender	**Male**	**57.7**
	Female	42.3
Age	15-25	17.6
	26-40	**50.0**
	41-50	19.2
	>50	13.2
Education	No formal education	9.3
	Primary	23.6
	Secondary	**37.9**
	Tertiary	29.1
Household Size	1 person	9.2
	2 persons	15.0
	3	9.8
	4	20.3
	>5	**45.6**
Marital Status	**Married**	**69.2**
	Single	19.8
	Divorced	6.6
	Widowed	4.4
Occupation		
	Peasant	9.3
	Civil servant	17.6
	Political Leader	11.0
	Business	42.9
	Others	19.2

Source: Field data, 2022

3.2 Rural Electricity Connection

In this subsection, findings relating to rural electricity connections are presented. In the questionnaire, participants were, for example, asked whether their houses are connected to the national grid. A summary of their responses is presented in Figure 2 below.

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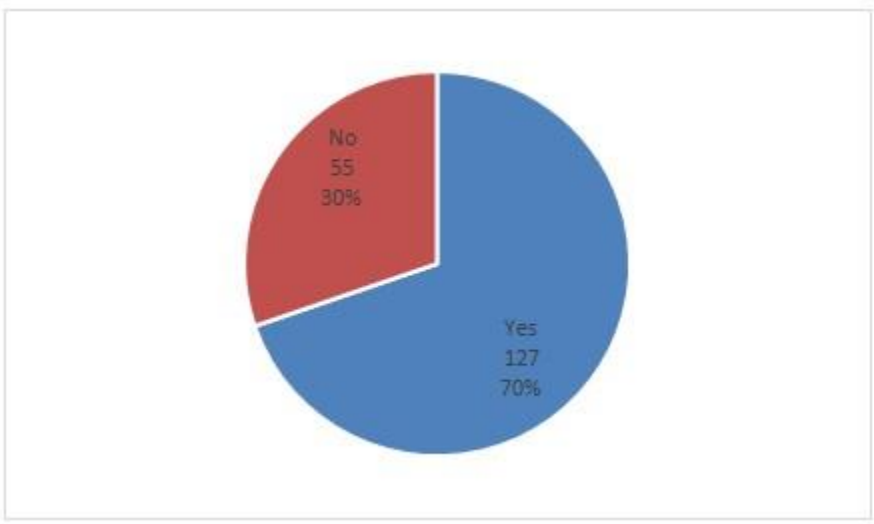

Figure 2: Whether households have electricity

Going by the statistics in Figure 2, it can be said that the rate of electricity connection in the area of study stands at 70%. This is based on a sample of 127 out of 182 who agreed that their households had electricity. Slightly above 55 (30.2%) had not been connected and were therefore relying on other sources of energy for lighting, cooking, and so on. In one of the narrative excerpts from a community safety agent, this is what he had to say while commenting on the achievements of the program:

...we have over 100 homes out of 5000 connected within only 2 years of the commissioned. Another respondent emphasized: "*We have achieved our objective. So far, we have over 80 houses to be connected and soon we shall connect more unfinished areas"* (Electricity engineer).

The quotations above demonstrate that the rural electrification initiative is prevalent in the study area and that, with time, it is tempting to connect the communities in the Rural Sanga and Sanga Town Council communities by the time this study was underway. Besides, the above quotation also shows that the rate of connecting households to electricity services is gradual, especially considering that an estimate of less than 200 out of the 5000 houses have been connected in two years. Connection the 5000 houses could thus mean a period of over 20 years.

3.3 How rural electrification initiative been achieved in Rural Sanga and Sanga Town Council

Respondents were given statements outlining the government's mandated goals for electrification. The degree to which a certain purpose had been accomplished was the next step in which participants were invited to express their own judgments. The descriptive data therein is summarized in Table 4.8.The mean scores used were

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interpreted as; 1.00-1.80 considered *strongly disagree*; 1.81-2.60 is considered *Disagree;* 2.61-3.40 denotes *Neutral* or *uncertain*; 3.41- 4.20 stands for *Agree* and 4.21-5.00 for *Strongly Agree*.

Table 2: Rural Electrification initiatives achieved in Communities

Rural Electrification	N	Mean	SD	Average Response
1. Provision of power to public institutions like health services, schools, and district Headquarters for better service delivery	207	3.26	1.13	Neutral
2. Distribution and improvement of power access for domestic and commercial use with free pole connectivity.	207	2.99	1.48	Neutral
3. Electricity promoted small-scale enterprise activities, farming and industrial developments	207	2.52	1.38	Disagree
4. Electricity has reduced the usage of air pollution (dangerous) energy sources like Candles.	207	2.44	1.42	Disagree
5. Brought the enjoyment of same services by rural communities like town dwellers like Fridge, phone, television, charging and ICT access.	207	2.41	1.44	Disagree
6. Ensure resource balance among communities	207	2.28	1.44	Disagree
7. Promoted security through lighting	207	2.02	1.38	Disagree
8. Improved knowledge of electricity usage, Skills and capacity for staff and communities in on energy sector services	207	2.14	1.40	Disagree

Source: Primary data from the Rural Sanga and Sanga Town Council

With the secured funding government provided power to public institutions by the government as a means of improvement in service delivery, had 162 (89%) of respondents agreeing to objective. Health Care services mushrooming in villages, schools, administrative units, National Park offices and hotels were having power and services offered had also improved.

According to Table 2, the notion that one of the ways access rural electrification initiatives were achieved was in terms of providing power to public institutions like health center services, schools, lodges, churches, Government offices and Sub county headquarters, with a mean of 3.26; SD = 1.13, received a neutral response.

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By implication, the large institutions that deliver essential services to the nearby villages did receive adequate priority though not all institutions received service under the objectives of the rural electrification effort planned for under REA. For instance, the schools having enough energy, students could study both day and or at night. The unreliability of lighting in the classrooms, and even if solar power is available, affects children focus at night.

In health centres, electricity is useful for performing surgical procedures, preservation of vaccines, storage of medicines and night admissions due to presence of medical staff to serve emergences cases at night. The absence of services at some of the health centres and long travels made to seek such services despite the provision of electricity creates dissatisfaction from respondents. It was noted that many health facilities, drug shops had taken advantage of the connectivity for basic services and registered more inpatients seeking medical services at night.

Institutions accessing power is an improvement in service provision though may still require additional installations of appliances and their ability to attract developments nearer as a key target for government has registered a neutral score hence more services to be weighed other than electricity. Supply electricity in places of interest and provision of incentives for connectivity was top of the list judging from the fact that local leaders, politicians and interest groups also lobbied and influenced government on access and utilization of electricity for electorate.

3.4 Socio-economic impact of the rural electrification initiative on the livelihood of communities

The study sought to find out the socio-economic impacts of rural electrification development on community livelihoods improvement. Like in the previous section, the measures of livelihood were presented to respondents in form of closed ended items on which they were asked to indicate their level of agreement regarding the extent to which they agree or disagree with particular statements.

3.4.1 Descriptive statistics

The descriptive data therein is summarized in Table 4.4.The mean scores used were interpreted as; 1.00-1.80 considered *strongly disagree*; 1.81-2.60 is considered *Disagree;* 2.61-3.40 denotes *Neutral* or *uncertain*; 3.41-4.20 stands for *Agree* and 4.21-5.00 for *Strongly Agree*.

Table 3: Impact of rural electrification on livelihood of communities

Impact of rural electrification	N	Mean	Std. Devn	Average response
Increases participation in non-farming enterprises establishments like salons, barbershops, posho mills, battery charging, cell phone charging, and welding.	207	2.17	1.31	Disagree

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Led to the promotion of digital migration / ICT usage like Internet cafes and computer training centre	207	2.06	1.25	Disagree
Electricity power has led to the increased use of machinery, value addition and increased entertainment e.g. welders, fridges, threshers, printers, computer, Tvs, disco halls, videos	207	2.39	1.47	Disagree
Has increase in life span usage of perishable agricultural products like Milk and medical appliance like Veteran drugs that require fridge for storage	207	2.47	1.56	Disagree
Has improved quality and quantity of medical services	207	2.36	1.50	Disagree
Many people have migrated to this village and few are willing to relocate.	207	2.30	1.40	Disagree
Land value has gone up especially in market centres	207	2.82	1.45	Neutral
Family incomes have improved in the village.	207	3.13	1.39	Neutral
Has led to infrastructure development like Roads, Schools, Communication networks, water and administration centres	207	3.24	1.41	Neutral

According to Table 3, with a mean of 2.17 and a standard deviation of 1.31, "disagree" was the most common response to the claim that rural electricity increases involvement in non-farming companies such salons, barbershops, grinding mills, battery and phone charging stations, and welding. This could be that some respondents in Sanga Sub County had minimal impacts and more enterprises were yet to access electricity compared to Sanga town council. However, this does not totally indicate that non-agricultural services are not evident. For instance, interview results reveal that communities participate in a number of non-agricultural activities are in place, that is:

"The major socio-economic impact of rural electrification in this place is promotion of village entertainment, increased involvement in off farm activities such as salons, barbershops cell phones charging and welding among others. There has also been a major increase in the price of land, rents particularly in main centers, improvement in security and night services. Respondents further noted that compared to the situation before the launching of the electrification program, there is a significant improvement in not only infrastructure as but income of the rural households has also improved with establishments of businesses".

The above quotation thus, signifies the gradual shift from solely reliance on agricultural products or activities to a situation where communities now deal in different activities courtesy of having accessibility to electricity.

In addition, findings as per Table 3, the claim that rural electrification leads to the promotion of digital migration through ICT usage, such as internet cafes and computer related services, received a rating of "disagree" with mean = 2.06; SD = 1.25. This is an indication that when addressing the impact of rural electrification on ICT usage to improve livelihoods, a lot is still desired in this line of events since information access is limited to few who owned phones and the interest of a given age group category. For instance, the youth were more likely to use internet services than the older age groups.

Similarly, findings indicated that rural electrification influenced promotion in village entertainment industry, e.g. TVs, use of electrical appliances for value addition with rating "disagree" and mean = 2.39; SD = 1.47 an indication that possibly few households in Sanga sub county have electrical appliances compared to households in SangaTown council. Accessibility is negligible and limited to few business which offer entertainment services;

From the interview responses, it is quoted:

"Storage and usage of perishable agricultural products like milk, perishable foods and medical drugs which require refrigeration were a major hindrance. With rural electrification however, this is no longer a big problem as many businesses are able to store such products in refrigerators to prolong shelf life and keep them cool. The most outstanding problem however relates to reliability of electricity and the duration it takes to comeback. Where the duration is long businesses, whose operations solely depend on power supplied by the national grid systems comes to a standstill".

On the other hand, findings in Table 3 indicate that to some extent, there are some neutral responses which provide some evidence that rural electrification has a link with the livelihoods of communities in surrounding areas. These are such as: land value and rental fares for houses had gone up, especially in market centres, near tourism development facilities, with a mean score of 2.82; SD = 1.45; improvement in incomes for some families (M = 3.13; SD = 1.39) and has led to infrastructure development like roads, schools, communication networks, adequate clean water administration centres and permanent houses improving living conditions. In relation to these findings, rural electrification access officials revealed that:

"To a very bigger extent. SMEs, agro processing, Hotels and tourism, Manufacturing, metal workshops, education institutions, security systems among others, all use electricity and development has been evidenced in electrified rural areas. The most recent example being districts in Kirihura isingiro, Kamwenge, North Karamoja region including Kotido, Kaabong, Abim, Karenga where business environment has taken a competitive shape because on newly commission electricity project under IDB1 lot

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3.4.2 Correlation results between Access and livelihood

To obtain the results for this section, item for Table 2 were computed and they served as the dependent variable (livelihood). Thereafter, each of the items for Table 3 was correlated with the computed value to obtain results in table 4 below;

Table 4: Relationship between rural electrification and Livelihood of communities

		Livelihood
Increased participation in non-farming enterprises establishments like salons, barbershops, posho mills, battery charging, cell phone charging, and welding.	Pearson Correlation	.670**
	Sig. (2-tailed)	.000
	N	207
Promotionof digital migration / ICT usage like Internet cafes and computer training centre	Pearson Correlation	.579**
	Sig. (2-tailed)	.000
	N	207
Electricity power has led to the increased use of machinery, value addition and increased entertainment e.g. welders, fridges, threshers, printers, computer, Tvs, disco halls, videos	Pearson Correlation	.596**
	Sig. (2-tailed)	.000
	N	207
Increasein life span usage of perishable agricultural products like Milk and medical appliance like Veteran drugs that require fridge for storage	Pearson Correlation	.517**
	Sig. (2-tailed)	.000
	N	207
Improvedquality and quantity of medical services	Pearson Correlation	.305**
	Sig. (2-tailed)	.000
	N	207
Many people have migrated to this village and few are willing to relocate	Pearson Correlation	.298**
	Sig. (2-tailed)	.000
	N	207
Land value has gone up especially in market centres	Pearson Correlation	.220**
	Sig. (2-tailed)	.001
	N	207
Family incomes have improved in the village	Pearson Correlation	.120
	Sig. (2-tailed)	.085
	N	207
	Pearson Correlation	.172*

Infrastructuredevelopment like Roads, Schools, Communication networks, water and administration centres	Sig. (2-tailed)	.013
	N	207

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

According to table 4, there is a strong positive and statistically significant relationship between increased participation in non-farming enterprises and establishments such as salons, barbershops, grain mills, battery charging, cell phone charging, and welding as a result of rural electrification and community livelihood (r =.670**; p = 0.000). By extension, a total of 67.0% improvement in a community's livelihood is realized if economic activities change as a result of rural electrification.

According to table 4, there is a strong positive and statistically significant relationship between the promotion of digital migration/ICT usage like Internet cafes and computer training centers, as a result of rural electrification and community livelihood (r = 0.579**; p = 0.000). This suggests that enhancement in ICT services and facilities courtesy of rural electrification is tantamount to a 57.9% improvement in the entire community's livelihood in the Rural Sanga Sub-county and Sanga Town Council.

Better still, results as per table 4 continue to reveal that a strong positive and statistically significant relationship does exist between the promotion of the village entertainment industry, e.g., TVs, and the livelihood of communities (r = 0.596**; p = 0.000). This is a clear indication that communities in the Rural Sanga Sub County and Sanga Town Council realize a 59.6% positive change in their lifestyles if the rural electrification project is used to promote village entertainment or to promote the entertainment industry. A slight dig-deep into this indicates that when electricity promotes the entertainment industry, there will be sports betting clubs and money will be earned through related gambling activities, which in one way or the other enhance the lifestyles of those who participate in such ventures.

Table 4 reveals a strong positive and statistically significant relationship between the notion that due to rural electrification, there is an increase in the life span usage of perishable agricultural products like milk and medical appliances like veteran drugs that require a fridge for storage and community livelihood (r = 0.517**; p = 0.000). This suggests that communities in the Rural Sanga and Sanga Town Council experience a 51.7% change in lifestyle because rural electrification promotes the safe keeping of perishable agricultural products.

Table 4 continues to unveil a medium-positive and statistically significant relationship between improved quality and quantity of medical services and community livelihood (r = 0.305**; p = 0.000). This suggests that communities in the Rural Sanga and Sanga Town Council experience a 51.7% change in lifestyle because rural electrification promotes the safe keeping of perishable agricultural products. Furthermore, there is a related medium-statistically significant relationship between the idea that many people

have migrated to this village and few are willing to relocate and community livelihood (r = 0.298**; p = 0.000). This means that just 29.8% improvement is realized in communities in the wake of the rural electrification program to LMNP. Other weak relationships were Land value has gone up especially in market centres and community livelihood (r = 0.220**; p = 0.001).

In summary, there is a strong positive and statistically significant relationship between. increased participation in non-farming enterprises and establishments such as salons, barbershops, posho mills, battery charging, cell phone charging, and welding (r =.670**; p = 0.000). By extension, a total of 67.0% improvement in a community's livelihood is realized if economic activities change as a result of rural electrification. When electricity promotes the entertainment industry, opportunities money will be earned through related gambling activities. Table 4.5 reveals a strong positive and statistically significant relationship between improved quality and quantity of medical services and community livelihood. This suggests that communities in the Rural Sanga and Sanga Town Council experience a 51.7% change in lifestyle because rural electrification promotes the safe keeping of perishable agricultural products.

3.5 Factors affecting effective access and utilization of electricity among the community livelihood

It is evident from the most current evaluations that the project is not completely benefiting the nearby communities, despite their closeness to the endeavor. But even if that were the case, the livelihoods would improve with the lifestyle of people would at least shift steadily and sustainably. The results based on individual item scores are shown in Table 5 and the mean scores used were interpreted as; 1.00-1.80 considered *strongly disagree*; 1.81-2.60 is considered *Disagree;* 2.61-3.40 denotes *Neutral* or *uncertain*; 3.41- 4.20 stands for *Agree* and 4.21-5.00 for *Strongly Agree*.

Table 5: Factors affecting effective access and utilization of rural electrification initiative by community

Factors affecting effective accessibility	N	Mean	Std. Deviation	Interpretation
No good security and night services to keep connections	207	2.63	1.190	Neutral
The willingness of the community to pay is based on purchasing power.	207	2.93	1.573	Neutral
Population density- age, sex, etc large	207	2.47	1.457	Disagree
Information/knowledge still scarce	207	2.44	1.381	Disagree

Costs and market forces of supply and demand	207	2.89	1.497	Neutral
Attitude and perception of the community	207	2.87	1.472	Neutral
Choice of technology is limited	207	2.73	1.535	Neutral
Access to resources and their affordability	207	2.64	1.544	Neutral
Government intervention/policy	207	2.79	1.494	Neutral
Infrastructural development still slow	207	1.89	1.319	Disagree

According to Table 5, inferences can be drawn there six factors that were considered to be affecting utilization and access to electricity resources and its affordability, willingness of the consumer to pay based on his/her purchasing power and good security were some of factors that were agreed upon to affect use of electricity. This further explained by the number of households that had applied for connectivity and completed wiring of houses but delayed supply of utilities by government which meant that community has interest in the electricity provision.

Other influencing factors are include: costs and supply and demand market forces (Mean = 2.89; SD = 1.49); attitude and perceptions of the community towards the program, expressing divided perceptions as some fight to keep the program, while others look at vandalizing the system such as theft of transformer fuels, electric wires and illegal connections (Mean = 2.87; SD = 1.47); limited choice of technology use (Mean = 2.73; SD = 1.53); access to resources and affordability (Mean = 2.64; SD = 1.54); and government intervention policy(Mean = 2.79; SD = 1.49).According to most of the households contacted government intervention/policy to supply electricity in places of interest and provision of incentives for connectivity was among the notions under neutral judging from the fact that local leaders, politicians and interest groups also lobbied and influenced government on access and utilization of electricity by electorate.

Though without majority support, infrastructures support, Population density, information and knowledge had received limited support from respondents as factors affecting utilization of electricity meaning that there was limited knowledge of the subject contribution to gaining access compared to other factors.

On the qualitative side, the majority of the households contacted reported that the six main factors affecting the effective utilization and uptake of rural electrification in rural Sanga and Sanga Town council were population dynamics, including associated costs, infrastructure, access to electricity resources and their affordability, willingness of the consumer to pay based on his or her purchasing power, and market forces of demand. Therefore, it is anticipated that working on these characteristics will enhance its acceptance.

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4. CONCLUSIONS

Rural electrification is a government program to provide and improve service delivery to the public to ensure economic growth among the population through job creation for all. The study revealed that rural Sanga sub county received power lines supplying electricity to households along the roads and in trading centres with low rate of connectivity to power due to bureaucracy in getting connected and high costs involved in wiring the facilities. While town council almost 100% had embraced the project.

The coming of rural electrification project was a blessing to community to start up and improve their overall business environment hence socio economic gains from enterprises which are agro based had gained from value addition and prolonging of shelf life of the commodities using coolers and improved faming using machinery availed by welding services . From the study, the researcher concluded that electricity had a key role in livelihood improvements alongside other factors such as good or adequate infrastructure (transport, telecommunication, and information infrastructure; market access) that facilitates economic growth, with the evidence of changing from on farm to off farm enterprises and improvements in housing conditions.

The cost of electricity significantly affects the utilization of electricity for the suppliers and consumers of electricity. Several benefits accrued to its access have shown a significant change in service delivery, consumers' lifestyle and incomes. To increase consumption of electricity, appropriate pricing mechanisms are required, as well as public financing, safety, and regulation in its use. The provision of incentives and awareness of such incentives will attract more customers and generate revenue for the suppliers. From the findings, we also see that the availability of electricity by the government and its affordability have significantly influenced the electrification uptake and utilization by households, especially if the conditions for access are favorable to consumers with associated benefits.

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