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Rural Electrification and Profitability among Rural Women - Owned Microenterprises in Nigeria

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Abstract
In most developing countries, higher numbers of women depend on microenterprise for survival, and access to electricity supply is considered to be vital to the operations of microenterprise businesses. Despite the significance of rural electrification, microenterprises are still battling with a lack of quality and stable electricity supply. To this end, this study analyzed the effect of grid electricity supply on the profitability of microenterprise among rural women. Primary data were used for this study. The data collected were analyzed using descriptive statistics, the Probit model, and the ordinary least square (OLS) method. The result shows that hairdressing (16.8%) is the most common form of businesses followed by tailoring (14.1%), oil palm processing (12.4%), grain milling (7.9%), traditional birth attendants and retail shop (7.1%). Also, the result reveals that age, years of schooling, connection charge, enterprise share of electricity bill with household, and duration of power outage supported the adoption of electricity service among microenterprise owners. The study further shows that the billing method of electricity supply negatively affects the profitability of microenterprise. On the other hand, grid electricity adoption, years spent in business, duration of power supply, and expenditure on alternative sources of energy significantly have a positive impact on the profitability of microenterprise. The study, therefore, recommends that the Government should intensify action in providing rural communities with reliable and affordable electricity services, which is one of the indispensable tools in microenterprises establishment, expansion, and performance.

Keywords: Electricity, Rural women, Microenterprise and Profitability

Introduction

Micro, small, and medium scale enterprises are sub-sectors of the industrial sector, which play crucial roles in industrial development (Ahmed S., 2006). There are about ninety million micro, small and medium scale enterprises in developing countries and emerging markets, and the density of formal micro, small and medium scale enterprises in low- and middle-income countries is rising (Kushnir et al., 2010). Microenterprises can be distinguished according to the nature of activities and type of energy services they use for production or performing their functions. Micro-enterprises such as brick burning, local beer brewing, ceramic firing, salt drying, fish drying and smoking, and charcoal production depend on biomass fuels as a source of process heat. Other microenterprises like retail shops, salons, restaurants, and bars, wood processing, welding, depend on electricity services for lighting, refrigeration, entertaining customers (playing Radio, Music systems, and Television), cooking, baking, shaft power, grain grinding and oil processing (Sawe, 2003).

Rural microenterprises ensure value addition to agricultural resources in rural areas engaging largely rural human resources. The underlying rationale of developing microenterprises is that they provide additional employment opportunities and ensure a more equitable distribution of income and a better standard of living to the rural inhabitants. Global experience shows that the development of rural microenterprises is one of the most cost-effective ways of creating employment, scattering the industry, catalyzing research and development, and allowing entrepreneurial talent to prosper (Dipanjan and Ratan, 2012).

Women's involvement in a business is a global phenomenon. Globally, women business owners have been increasing steadily, and today women in advanced market economies own more than 25% of all business (Woldie and Adersua, 2004). In most developing countries, micro-enterprises are owned and run by women (Sharma et al., 2012) as a means of survival. In Nigeria, women agricultural micro-enterprises employed over 60% of the labor force in the early 1970s (May 2007). The contributions of micro-enterprises globally, especially women, have given rise to various enterprise development programs, by nations of the world, to provide business training, micro-credit, and other supports for business development and performance. It is a fact that women micro-enterprises contribute positively to the economic development of any country. This is often noticed in job creation and community development (Kim & Sherraden, 2014).

Rural electrification is the process of generating and distributing electrical energy in rural expanse (Bhattacharryya, 2006). Linking microenterprise to rural electrification grids is an essential aspect of rural electrification service (Barnes and Foley, 2004). Electricity is a crucial factor input for many energy services that can contribute to enterprise operation. Access to electricity supply is widely considered to be vital to the activities of most micro, small and medium-scale businesses and therefore access to electricity and its cost play a role in the viability and profitability of the enterprise. Lack of access and inadequate electricity services can constrain business operations. High quality and accessible infrastructure encourage productivity, business growth, and investment, but when it is poor and unreliable, businesses' productivity and growth suffer.

Despite the importance, contributions, and potential of micro-enterprises in the Nigerian economy, there are several factors that hinder their growth. One of these factors includes grid electricity services because, without available and reliable electricity services, there is no possibility of utilizing modern electrical appliances and machinery, which may pave the way to small and cottage industries. Therefore, to protect their business and persistent fall in production, SMEs are forced to use alternative power sources such as solar energy, standby generators, and other fuel or gas-powered equipment (Maleko, 2005). Also, they tend to work on an overtime basis to recover lost production.

In Nigeria, successive governments at the different tiers have tried to provide electricity using rural electrification programs, which involves extending the existing distribution lines to rural communities. Such programs have huge potential benefits because the availability of electricity and other basic amenities can increase the productivity and profitability of existing micro-enterprises, and also reduce the barrier to the creation of new micro-enterprises (Kooijman-van Dijk & Clancy, 2010; Nichter & Goldmark, 2009) which in-turn may increase the available disposable income that may be used to improve the standard of living. However, many poor households living in villages that already have power lines and transformers choose to remain without adopting grid electricity due to the remoteness of some town, electricity pricing policies, household characteristics, and reliability of the power supply (World Bank, 2015). Additionally, very little documentation has been done to ascertain the impact of rural grid electrification on rural women micro-enterprises profitability. The result of the study will bridge the knowledge gap in this area and also provide policymakers useful suggestions on maximizing the potentials of rural electrification in rural development in the region. Therefore, this study identifies the microenterprise activities practiced by rural women in the study area, establishes the determinants of rural electrification adoption by women entrepreneurs, and examines the effect of

rural electrification adoption on the profitability of microenterprises of rural women in the study area.

Literature Review

Electricity is a prerequisite for the proper functioning of nearly all sub-sectors of the economy. It is an essential service whose availability and quality determine the success or failure of development endeavors (URT, 2003). There is a synergetic connection between electricity and business. Several studies have been carried out on the impact of access to power on small and micro-scale enterprises in developing countries.

Kooijman-van Dijk and Clancy (2010) evaluated the impacts of electricity access to rural enterprises from a three-country study in Bolivia, Tanzania, and Vietnam. The paper aimed to provide insights into the scope and depth of impacts of modern energy services. Evidence from the study showed that all three countries studied opportunities to use electricity for enterprises depend on the markets for enterprise products and the location of the enterprise. It was also revealed that women benefitted from modern energy in their enterprises. For a few women, electricity opened up new possibilities. Also, access to power in enterprises was found to have a more substantial impact on non-financial aspects of poverty through the products and services of the enterprises than on financial poverty reduction through increasing incomes from enterprise operation.

Akpan et al. (2013) investigated how rural electrification through the extension of the existing grid has impacted rural microenterprises in Niger Delta, Nigeria. The result showed that, on average, enterprises in communities connected to the electricity grid are 16.2% more profitable than enterprises in communities not connected to the network, and the use of generating sets in providing back-up electricity makes microenterprises more profitable. The study also observed that micro-enterprise owners are fully aware of the importance of electricity access to the profitability of their businesses, and those who can afford to generate sets willingly do so. Also, the total expenditure on making sets by some enterprises is up to three times the tariff for grid electricity in rural areas. The high cost of self-generated electricity increases the total value of doing business in rural areas, thus reducing the profit margin of the micro-enterprises.

Kariuki et al. (2016) assessed rural electrification adoption by microenterprises in Muranga county Kenya. The study focused on the determinants of rural electrification adoption by micro and small enterprises and the effect of the passage of rural electrification on the performance of agricultural micro and small enterprises. The study used primary data and adopted two-stage least squares for analyses. Results revealed that the amount of capital invested, nature of the business activity, and distance from the market significantly influenced the predicted probability of electricity adoption. Results also showed that electricity adoption was positive and significantly related to business performance. The results also indicated that gender, capital invested, and the workforce was positively and significantly related to business performance. The study also recommends that Murang, ''a County and electricity providers should encourage electricity adoption through conducting awareness campaigns that would sensitize small business owners on the value brought about by electricity.

Barfour (2013) conducted a study seeking to establish barriers to rural electrification in Ghana. The results showed that there existed various challenges which include: level of the country people; high cost of grid extension to thinly populated and remote areas; lack of cluster acceptability of off-grid systems; ownership, management, and operations of renewable systems especially mini-grid; inadequate funding from government budget; low level of electrification levy and lack of private capital lack of commitment of the utilities.

Nanka (2010) conducted a study on the socioeconomic drivers of rural electrification in Sub-Saharan Africa. The study employed cross-sectional data for 24 of the 47 countries in the sub-Saharan region. The literature review indicated a combination of institutional, economic, social, and technological factors needed to be considered when assessing rural electrification. The results of the econometric study showed that the factors which have a significant impact on rural electrification were; the Human Development Index, wealth distribution, the level of institutional development, and the size of the urban

population. A detailed policy survey of four countries from the sample; two countries categorized as over-performing (Nigeria and Madagascar) and two as under-performing (Tanzania and Chad), highlighted that collaboration with international partners, integration of national policies and strategies and the use of renewable energy sources enhanced the development of rural electrification in sub-Saharan Africa.

Nyanzu and Adarkwah (2016) conducted a comparative analysis between two regions in Ghana, where small and medium firms are located. The study analyzed the effect of power supply on the performance of SMEs using the World Bank 2013 enterprise survey on Ghana, which consists of 710 firms. The study employs both chi-square and t-test to do pattern analysis. Also, ordinary regression analysis (OLS) was used to regress firm performance variables on electricity supply variables and other covariates. The results show that the presence of power outages negatively affected the firm's performance (profitability). Also, it was further realized that power outages (power interruptions) severely affects SMEs located in the Northern part of Ghana than SMEs located elsewhere. The study, therefore, recommends that SMEs should consider alternative sources of power such as solar power, inverter, biogas, generators, which would help curb the cost power outage brings to their production and to boost output.

Neelsen & Peters (2011) assessed the impact of electricity access in microenterprises in Uganda using quantitative firm-level data from 200 enterprises complemented by qualitative case studies. The study found out that there was a little direct impact of electricity access on firm profits or worker remuneration. However, there was a significant indirect effect mainly due to an increase in demand for goods and services prompted by migration from non-electrified to electrified communities. The study concluded by stressing the need for productive energy promotion policies to be put in place to assist local entrepreneurs in making informed business decisions.

Methodology

Study Area

The study was carried out in Odeda Local Government Area of Ogun State, Nigeria. Odeda LGA shares boundaries with Ibarapa and Iddo Local Government Areas of Oyo state in the North and East, respectively, while in the South and West by Abeokuta South and Obafemi / Owode Local Government Areas, respectively. Odeda LGA has three zones, namely: Odeda, Ilugun, and Opeji zones; Odeda had four wards, while Opeji and Ilugun had three wards each to give a total of 10 wards. Odeda LGA has a landmass of 1,263.25 sq. Km, and a population of 109,449 based on the 2006 population census (National Bureau of Statistics 2009).

Source of Data and Sampling Procedures

A primary cross-sectional data was collected using a structured questionnaire administered to women that are engaged in various microenterprise economic activities. A multi-stage sampling technique was employed for this study. The first stage involved the random selection of five wards out of the ten departments in the Local Government Area. In the second stage, two communities were randomly chosen from each selected neighborhood giving a total number of ten cities. The last step was a purposeful selection of twelve women that are engaged in various microenterprise economic activities from the selected communities, making a total of 120 respondents. Thus, one hundred and twenty women were randomly selected and interviewed using structured questionnaires, but only one hundred and thirteen inquiries were found useful and valid for the study.

Methods of Data Analysis

Descriptive statistics were used to examine the socio-economic characteristics of rural women and various microenterprise activities practiced by them. The graphic tools used include frequencies and percentages.

A Probit model was employed in estimating factors that determine the adoption of enterprise grid connectivity among rural women entrepreneurs. The adoption of grid electricity, which is bivariate, may be influenced by elements of its own and its community,

including the availability of power at the community level. The model assumes that there is a latent, unobserved continuous variable that determines the value of Y and includes believable error term distribution as well as realistic probabilities (Oni et al., 2011). The model is specified as follows:

$$Y^* = X^t \beta + \varepsilon_i \text{ where, } \varepsilon \sim N(0,1)$$

Then Y can be observed as an indicator for whether this latent variable is positive:

Y = electricity access variable (1 if enterprise adopt grid connection and 0 otherwise)

X = Vector of explanatory variables

β = Coefficients

εi = Random error

The explanatory variables included in the model are:

X_1 = Gender (D=1 if female; 0 otherwise)

X_2 = Marital status (D=1 if married; 0 otherwise),

X_3 = Age of business owner (Years)

X_4 = Number of years of formal schooling of the business owner

X_5 = Connection charge (Naira)

X_6 = Distance of enterprise to the nearest transformer (Kilometre)

X_7 = Nature of business (D=1 if connected to electricity; 0 otherwise)

X_8 = Access to an alternative source of energy (D=1, if Yes; 0 otherwise),

X_9 = Monthly duration of a power outage (Numbers)

X_{10} = Enterprise share of electricity bill with household (D=1, if enterprise share of electricity bill with family; 0 otherwise)

Ordinary Least Square (OLS) method was employed to determine the effect of rural grid electricity connection on the profitability of microenterprise. The model is specified below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_m X_m + u_i$$

Y= profit of microenterprise (measured in terms of net profit of the enterprise)

X_1 = explanatory variables

β_0 = constant

β_1 = regression parameters to be estimated.

u_i = error term

The explanatory variables included in the model are:

X_1 = Age of business owner (years)

X_2 = Number of employees

X_3 = Enterprise adopt grid electricity connection (D=1, if Yes; 0 otherwise)

X_4 = Number of years in business

X_5 = Monthly expenditure on electricity

X_6 = Nature of business (D=1 if Individual; 0 otherwise)

X_7 = Durations of power supply (number of hours daily)

X_8 = Durations of a monthly power outage (numbers)

X_9 = Monthly billing method (D=1, if estimate billing; 0 otherwise)

X_{10} = Access to an alternative source of power supply (D=1, if Yes; 0 otherwise),

X_{11} = Monthly expenditure on alternative energy sources

Results and Discussion

Socio-economic and Demographic Characteristics of Rural Women in Microenterprises

As shown in Table 1, about (33.6%) of the respondents are between the age range of 20-30 years, about 41.6% are between the age range of 31-40 years, about 15.9% are between the age range of 41-50 years, while 8.9% are of age 51years and above. Based on the result, the majority of the rural women entrepreneurs were aged between 31 and 40 years. This result implies that the majority of the respondents fall within the economically active age group, which indicates that they are still very busy being involved in the business as a means of livelihood. They can even perform business activities efficiently. From the table also, the majority (34.2%) of the rural women entrepreneurs are married. The marital status enhanced economic status, and it is sometimes used as an indicator to determine the level of commitment and attitude to work. Thus, a vast majority have support from home to run their business activities.

Furthermore, Table 1 reveals the educational qualifications of the respondents. The result shows that (34.2%) have a primary school education, about (18.1%) have a secondary school education, (9.4%) have tertiary education, while (14.1%) do not have formal training. This find is vital since education is of great importance in the success of any business venture. The majority (34.2%) had a primary school. The educational status of entrepreneurs measures

their level of human capital; it endowed them with better managerial skills, understanding of production and market dynamics, which in turn impact on the performance of the enterprise. The business ownership structure is a significant factor that determines the right performance level and market participation. The distribution of respondents by the ownership structure shows that the bulk of the microenterprises (47.7%) were owned by individuals. About 6% of the businesses were family businesses, while (16.8%) were owned through partnership. This result portrays the significance of social recognition and self-esteem among respondents. This also means that the entrepreneurs are involved as key decision-makers in day to day operations of the business.

Also, majority of the respondents (30.1%) generate income between ₦20,100- ₦30,000 per month, about 20.4% of the respondents generate income between ₦10,000- ₦20,000 per month. Also, about 15% of the respondents generate income of ₦40,000 and above per month, while about 28.7% of the respondents had less than ₦10,000 per month. The majority (55.8%) of the microenterprise business had been in operation between 1-5 years. The result indicates a sizeable number of businesses are older than five years, which implies that the survival rate of microenterprise businesses among rural women in the study area is high and improving. This result also indicates that the rural women in the microenterprise business appear to have sufficient experience to enhance the performance of the microenterprise. The availability of financial funds to microenterprise business is vital to profit to be realized among the various commercial sources available to the respondents' higher proportions of the women (54.9%) funded their business through personal savings. Among other factors, this may be due to a low level of education and a lack of collateral. This was followed by a cooperative society (23%) and relatives (9.7%).

Table 1: Socio-Demographic and Economic Characteristics of Respondents Variables

Variables	Frequency	Percentage
Age (in years)		
<30	47	33.6
31-40	38	41.6
41-50	18	15.9
>50	10	8.9
Total	**113**	**100**
Marital status		
Single	46	30.9
Married	51	34.2
Separated	5	3.4
Widowed	8	5.4
Divorced	3	2.0
Total	**113**	**100**
Educational Level		
No formal Education	21	14.1
Primary Education	51	34.2
Secondary Education	27	18.1
Tertiary Education	14	9.4
Total	**113**	**100**
Business Ownership Structure		
Individual	71	47.7
Family	9	6.0
Partnership	25	16.8
Company	8	5.4
Total	**113**	**100**
Monthly Total Income		
<10,000	28	24.8
10,100- 20-000	23	20.4
20,100-30,000	34	30.1
30,100-40,000	11	9.7
>40000	17	15.0
Total	**113**	**100**
Years of Business Operation		
1-5	63	55.8
6-10	22	19.5
11-15	20	17.7
>15	8	7.1
Total	**113**	**100**

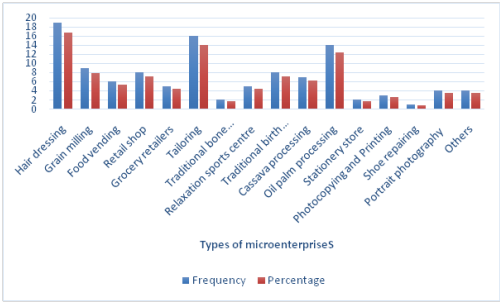
Source of Financial Fund		
Personal Savings	62	54.9
Relatives	11	9.7
Formal Institution	06	5.3
Cooperative	26	23.0
Friends	08	7.1
Total	**113**	**100**

Source: Field Survey, 2018

Nature and Types of Microenterprise among Rural Women Entrepreneurs

Among the various lines of business in Fig. One hairdressing (16.8%) is the most common form of companies that the rural women in the study area engaged in, this is followed by tailoring (14.1%), oil palm processing (12.4%) and grain milling (7.9%) Traditional birth attendants and retail shop both at (7.1%).

Fig. 1: Nature and type of microenterprise



Source: Field Survey, 2018

Factors Determining the Adoption of Grid Electricity by Rural Women Entrepreneurs

Table 2 shows the result of the probit analysis. The result indicates that Chi-square is significant. This suggests that the model has an excellent fit to the data. Out of the ten independent variables used in the model, five variables were found to be significant in determining grid electricity adoption among rural women in microenterprise businesses. The variables are the age of respondents ($p<0.1$), years of formal schooling ($p<0.05$), connection charge ($p<0.1$), duration of a power outage ($p<0.1$), and share of electricity bill with household.

The age of the respondents has a positive and significant effect on the adoption of grid electricity in the study area. This indicates that a unit increase in the age of women will significantly increase the probability of the passage of power among rural women by 0.0018. This also implies that the higher the age of a women entrepreneur, which is an indicator of experience, the more experience in business that will improve the decision to adopt a grid electricity connection. Also, the result revealed that years of schooling have a significant and positive relationship with the adoption of grid electricity. This is as expected since the level of education, which is social capital, should positively affect the level of efficiency in managing the enterprise resources. This indicates that rural women entrepreneurs with relatively higher years of formal education are more likely to adopt grid electricity than those of rural women entrepreneurs with relatively lesser years of formal education. This aligns with the findings of the World Bank (2015), who revealed that the literacy rates of households with electricity in rural areas are more than those households without power.

Furthermore, Table 2 shows that the connection charge is also one of the significant factors rural women business owners face in their decision to adopt rural grid electrification. The result indicates that the connection charge has a significant negative impact on the enterprise owner's decision to purchase a connection to the electricity grid. This implies that a unit increase in connection charges will reduce the level of adoption of grid electricity by 0.0681. This study is supported by Leegwater and shaw(2008), who noted that though people in rural areas might be in reach of the electricity grid, connection to it was not easy for most of the rural dwellers. Also, according to World Bank 2002; Modi 2005, they revealed that high connection charges and tariffs, as well as poor-quality power supply, can negate households' benefits from electricity, explaining why many low-income families living in villages that already have power lines and transformers choose to remain without electricity.

Also, the enterprise share of electricity bill with the household was significant and positive, implying that microenterprise sharing electricity bill with proprietor's family increases the probability of adoption of grid electricity by 0.0301. From the study, most of the enterprise owners shall pay electricity bills with proprietor's home,s which aids

in minimizing monthly electricity tariffs. Lack of reliable electricity supply is not just an inconvenience; it affects the effective operation of microenterprise. The duration of power outage shows a significant and negative relationship with grid electricity adoption by the respondents. This implies that an additional increase in a power outage will significantly decrease the probability of electricity adoption by 0132.

Table 2: Analysis of Factors Determining the adoption of Grid Electricity by Rural Women Entrepreneurs

Variables	Coefficient	Standard Error	P > /Z/	Marginal Effect
Gender	0.5557	0.4232	1.31	0.0882
Marital status	0.2959	0.2316	1.28	0.0550
Age of business owner	0.0097	0.0210	0.46*	0.0018
Years of formal schooling	0.0274	0.0400	0.68**	0.0051
Connection charge	-0.1513	0.0838	1.18*	-0.0280
Distance to nearest market	0.0225	0.0248	0.91	0.0451
Nature of business	0.3325	0.4777	0.7	0.0681
Access to alternative energy	0.0619	0.0696	0.89	0.0115
Duration of power outage	-0.0081	0.0001	1.09*	-0.0301
Share of electricity bill with household	0.0712	0.0376	1.89**	0.0132
Constant	0.1179	0.8039	0.15	
log likelihood -37.0707 LR chi^2 (10) 46.97 Prob>chi^2 0.000 Pseudo R^2 0.4036				
Note: ** and * are significance level at 5%, and 10% respectively.				

Source: Field Survey, 2018

Effects of Grid Electricity Adoption on Profitability of Microenterprises

Table 3 shows the empirical results of the OLS analysis, indicating the critical factors that influence the microenterprise profitability of rural women in the study area. Results suggest that grid electricity adoption by rural women entrepreneurs has a positive and significant impact on the profitability of microenterprises. This indicates than a unit increase in the adoption of grid electricity by the rural women business owner will result in an increase in the profitability of microenterprises by 0.0437 units. The findings imply that electricity adoption may have a decisive role to play in small microenterprise profitability. This result aligns with Kariuki et al. (2014), who, in their study, revealed that those micro and small enterprises with electricity connection had higher business performance compared to those who had not been connected to the electricity grid.

Results also reveal that years spent in business were significantly and is positively related to business profitability. This indicates that an increase in the number of years spent in marketing by one unit will result in an increase in the profitability of the micro-enterprises by 0.0092 units. The expectation is that the longer the number in years of the business, the more profitable the business. This outcome is consistent with the finding from research conducted by Akpan et al. (2013) in Nigeria. They asserted that an increase in the length of stay in business will increase the profitability of microenterprises in rural communities.

Additionally, the effective flow of electricity serving as an input in production processes and enhances consumers' satisfaction. The duration of power supply had a positive and significant relationship with the profitability of the microenterprises. This shows a unit increase in the supply of electric power will increase the profitability of the microenterprises by 0.0216 units. This result aligns with Frederick and Josephine (2016). They revealed a significant influence between the power supply and SMEs performance, indicating that if there is the availability of power for production, firms are likely to have a higher chance of being profitable and vice versa. The billing method of electricity supply

was also significant with a negative sign indicating that an increase in the use of the estimated bill will decrease the profitability of the micro-enterprises by 0.0483 units. This negative relationship was expected as a continuation in the usage of the estimated billing method leads to an increase in the cost of operations for business.

Furthermore, expenditure on alternative energy source was significant with a positive sign; this implies that for a unit increase in the spending on alternative energy source on the average, the profitability of the microenterprises increases by 0.0134 units. This result suggests that enterprise owners are aware of the importance of electricity to the profitability of their enterprises and increase the access and use of an alternative source of power for business operations will save time, making the goods and services available to customers when needed. This also helps in building an enterprise image. This result is in line with Akpan et al. (2013). They revealed that for every one-unit increase in the expenditure on running a generating set, on average, the profitability of the microenterprises increases by 13.1%. The study also observed that microenterprise owners are fully aware of the importance of electricity access to the profitability of their businesses and those who can afford it willingly spend on generating sets to provide electricity for their businesses.

Table 3: Result of the Effect of Rural Grid Electrification Adoptionon Profitability of Microenterprise

Variable	Coefficient	Standard Error	t- value
Age	0.0733	0.0425	1.72
Connection to grid electricity	0.0437**	0.1245	1.68
Number of employees	0.0130	0.1804	1.66
Number of years in business	0.0092*	0.0153	0.60
Monthly expenditure on electricity	-0.0274	0.6694	-0.41
Nature of business	0.0308	0.0119	0.26
Durations of power supply	0.0216**	0.0140	1.55
Durations of monthly power outage	-0.0016	0.7161	-0.23
Billing method	-0.0483*	0.0949	-0.05
Access to alternative source of power	0.0164	0.1036	0.02
Expenditure on alternative energy	0.0134***	0.5578	2.40
Constant	0.0053	0.0209	0.25
F(10, 101) 2.17 Prob > F 0.0000 R^2 0.6433 Adjusted R^2 0.6074			
Note: ***, ** and * are significance level at 1%, 5%, and 10% respectively.			

Source: Field Survey, 2018

Conclusions and Recommendations

The paper provides empirical evidence on the effect of rural grid electrification on microenterprises' profitability among rural women. The article confirms that the age of respondents, years of schooling, connection charge, enterprise share of electricity bill with household, and duration of power outage supported the adoption of electricity service among microenterprise owners. The study further shows that the billing method of electricity supply negatively affects the profitability of microenterprise. On the other hand, grid electricity adoption, years spent in business, duration of power supply, and expenditure on alternative sources of energy significantly have a positive impact on the profitability of microenterprise. The study, therefore, recommends that the government should intensify action in providing rural communities with reliable and affordable electricity services, which is one of the indispensable tools in microenterprises establishment, growth, expansion, and profit. Also, microenterprise owners should consider alternative sources of power, which would help in building enterprise image and productivity.

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