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Effect of electricity supply on the household well-being among proprietors of micro and small enterprises in rural Kenya

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Abstract
Developing countries including Kenya require electricity for startup of farm and nonfarm micro and small enterprises to enhance well-being of a majority of the rural inhabitants. According to World Happiness and Well-being Report 2019, Kenya was ranked position 121 globally with a relatively dismal performance index of 4.509 on a scale of 1-10. In view of the foregoing, a clarification was required through examining the effect of electricity supply on the household well-being among proprietors of micro and small enterprises in rural Kenya. The study adopted a cross-sectional descriptive survey design. The target population for this study comprised 172,554 proprietors of micro and small enterprises registered in the study area by 2015. The study adopted multistage sampling involving systematic and simple random sampling procedures due to the large target population involved. Primary data from proprietors of rural micro and small enterprises in eight counties namely; Kakamega, Bungoma, Nakuru, Busia, Bomet, Siaya, Kericho and Kirinyaga forming a sample size of 418 respondents was used. The data collection instrument was pilot tested on 5% of the sample size. Pearson correlation analysis showed that there was a general moderate positive relationship between electricity supply and household well-being among proprietors of micro and small enterprises. Regression analysis revealed that there was a significant positive relationship between electricity supply and household well-being among proprietors of micro and small enterprises. It was concluded that electricity supply has an influence on household well-being among proprietors of micro and small enterprises in rural Kenya. It is recommended that the Kenyan government should come up with clear policies and review legislations to ensure Rural Electrification Authority is given a clear mandate, authority and resources to fulfil their mandate, and ensure affordable electricity supply to rural households.

Keywords: electricity supply, well-being, micro and small enterprises

1. Introduction

1.1 Background to the Study

Well-being is a state of satisfaction of basic human needs and rights and a crucial pre-requisite before people can flourish and live well (Tinkler & Hicks, 2013) [32]. Well-being has become a policy concern in a range of nations, including the United Kingdom, Bhutan, the United Arab Emirates, and France, as well as at international organizations such as the United Nations and the OECD (Sachs, 2018 [29]; Tay, Chan & Diener, 2014). Countries with the highest levels of poverty and lower levels of household well-being tend to have lower access to modern energy services - a problem that is most pronounced in sub-Saharan Africa and South Asia (IEA, 2017).

The framework developed by the Sustainable Energy for All initiative to define and measure access to energy considers 30 kWh a month to be the subsistence level for grid electricity. The framework considers electricity affordable if a household does not have to spend any more than five percent of its total monthly income to purchase it (World Bank, 2015) [35]. In the case of rural areas, affordability is particularly considered to be one of the main obstacles to the adoption of modern energy. World Bank (2017) [34]. reports that in Africa, connection costs often exceed a country's monthly income per person, and households have to pay these plus fees for inspection and application, security deposits, internal wiring, and equipment costs. Interruptions to power supplies potentially affect MSEs' costs of production through the expense of repairing or replacing damaged equipment, the cost of spoiled goods and the additional cost of alternative sources of energy, such as generators (Cissokho & Seck, 2013) [6].

According to International Energy Agency (2013) [13], 33.6 million people (80 per cent of a population of 42 million) in Kenya lacked access to electricity in 2011. This means that Kenya had the seventh highest deficit in access to electricity in the world. Electricity consumption per capita was 155kWh per year in 2011, as compared to an average 219kWh in all low income countries, 535kWh in sub-Saharan Africa and a world average of 3,045kWh. The electrification gap in Kenya is larger in rural areas, where only seven per cent of the population has access, as compared to an urban electrification rate of 58 per cent (International Energy Agency, 2013) [13]. Electricity demand is expected to be 14 times higher in 2031 than in 2010, which will put the Kenyan system under high strain, according to the official Kenyan demand forecast presented in the Least Cost Power Development Plan (Republic of Kenya, 2011) [24].

1.2 Statement of the Problem

According to World Bank (2017) [34], use of electricity and

equipment in developing countries improved the productivity and incomes of local small and micro-enterprises and supported improved village infrastructure such as schools, healthcare facilities and markets. According to World Happiness and Well-being Report 2019, Kenya was ranked position 121 globally with a relatively dismal performance index of 4.509 on a scale of 1-10 (Helliwell, Layard & Sachs, 2019) [12]. Osanyinlusi, Awotide, Awoyemi, Ogunniyi, Adeyemi and Ogundipe (2017) [22]. established that rural electrification reduced poverty and improved standard of living in Nigeria. Similarly, a study by Bezerra, Callegari, Ribas, Lucena, Portugal-Perreira, Koberle, Sziko and Schaeffer (2017) revealed that rural electrification had a positive influence on all dimensions of Human Development Index (HDI) in Brazil. Conversely, households in Kenya are willing and able to pay, on average, about Ksh. 37 per kWh (US$0.35 per kWh) for improved energy services based on renewable energy resources (Kirubi *et al.*, 2009) [14]. In view of the foregoing, it is acknowledged that rural electrification improves well-being of the rural poor. This study therefore sought to establish whether the same trends are also realizable in Kenya.

1.3 Objective of the Study

The specific objective of this study was to assess the effect of electricity supply on the household well-being among proprietors of micro and small enterprises in Kenya.

1.4 Hypothesis of the Study

The null hypothesis of this study was that electricity supply has no effect on the household well-being among proprietors of micro and small enterprises in rural Kenya.

2. Literature Review

2.1 Social Exclusion Theory

The idea of social exclusion focuses attention on the processes (Room, 1995) [27]. by which poverty or disadvantage occurs. Increasing attention has been paid to the possible relevance of the concept to social policy analysis in developing countries, and it is widely adopted by development agencies and in development studies as another way of understanding and reducing poverty and enhancing well-being. Social exclusion is a broader concept than poverty, encompassing not only low material means but the inability to participate effectively in economic activities like entrepreneurship, social, political and cultural life and in some characterizations alienation and distance from mainstream society (Duffy, 1995) [8].

Todman (2004) [33]. explains that social exclusion is a consequence of the discriminatory decisions and actions undertaken by a society's political and economic elite who, by acting in their own self-interest exclude the other members of society, for instance, inadequate access to affordable energy in rural areas. Such powerful class and status groups, which have distinct social and cultural identities as well as institutions, use social closure to restrict the access of outsiders to valued resources such as employment, income, education, electricity, healthcare, good nutrition among others.

Social inclusion on the other hand has been defined as a process in which those at risk of poverty and social exclusion gain the opportunities and resources that are needed to fully participate in societal activities (Frazer & Marlier, 2013) [10]. In this study, electricity supply has been treated as a key means to tackle social exclusion, poverty and inequality that is critical to enhancing well-being of proprietors of MSEs. Social inclusion has also been seen as a foundation for shared prosperity that characterizes the process of improving abilities, opportunities and dignity of the poor through access to markets and services (World Bank, 2013). Spatial inclusion has been defined as a goal of connecting people to assets and goods regardless of their location for instance rural areas and is argued to be critical for poverty eradication, inclusive growth and improved household well-being (AfDB *et al*., 2014). Social inclusion has also been referred to as the endpoint of overcoming social exclusion, where social exclusion is characterized by the involuntary exclusion of individuals and groups from society's political, economic and societal processes, which prevents their full participation in the society in which they live (UNDESA, 2010). Social exclusion theory was used in this study to explain how lack of electricity excludes proprietors in rural areas from using this vital resource in enhancing well-being.

2.1.1 Electricity Supply and Well-being

Electricity supply and its reliability are amongst several considerations when MSEs make investment decisions (Scott, Darko, Lemma & Rud, 2014) [30]. Firms demonstrate high willingness to pay for reliable power through their investments in self-generation, which Steinbuks and Foster (2010) [31]. suggest is an opportunity for government and the private sector to charge higher prices for electricity in order to fund investments that will make power supply more reliable. The provisions of reliable, secure and affordable energy services are central to addressing many of today's global development challenges including poverty, inequality, climate change, food security, health and education as well as wealth creation and economic development (Bazilian *et al*., 2011) [3].

In countries where electricity reliability is very low, electricity-reliant businesses have to invest in diesel generators if they want to sustain regular business operations (Attigah & Mayer-Tasch, 2013) [2]. Adoption of generators by firms to cope with unreliable electricity can induce a reallocation of sales and profits towards more productive firms (Rud, 2012). Reliance on generators for electricity during outages can be expected to increase the cost of electricity, and the effect on cost-competitiveness is related to the proportion of total costs accounted for by electricity (Scott, Darko, Lemma & Rud, 2014) [30]. Interruptions to power supplies potentially affect MSEs' costs of production through the expense of repairing or replacing damaged equipment and the additional cost of alternative sources of energy, such as generators (Cissokho & Seck, 2013) [6]. The effect of these costs on the competitiveness of MSEs depends in part on their impact on total costs. Eifert *et al*. (2008) [9], for example, demonstrate that firm performance is sensitive to the cost of indirect inputs and that these costs, in which energy has the largest share, are a major factor in explaining the low productivity of enterprises in Africa. Unreliable electricity supply therefore has a significant negative impact on a firm's total factor productivity (Attigah & Mayer-Tasch, 2013) [2].

In a study on household energy use in Uganda, Drazu, Olweny and Kazoora (2015) [7]. assert that use of charcoal as the predominant fuel for cooking was a significant

revelation in households connected to mains electricity. This could be linked to two key factors: first, a perception that electricity tariffs are high (relative to income); second, the unreliable electricity supply compelling households to seek out alternatives in order to maintain regular meal times. Frequent outages in Kenya may be the reason for reluctance among households to subscribe, because they may consider the cost of service too high given its erratic availability, regardless of their specific budget constraints (Millien, 2017) [19].

Individual decision to connect to grid electricity is linked to the cost of the connection, which may be prohibitive to the rural poor households. Lee *et al.* (2016) [16]. reiterate that in Kenya moving away from full subsidization of connection costs leads to lower take-up rates than expected. By randomly allocating 10 and 20 per cent discount vouchers for connection fees to rural Ethiopian households, Bernard and Torero (2009) find that connections increase, on average, by 18 per cent, indicating that connection fees represent a significant barrier to the adoption of electricity. Similarly, Hanna and Oliva (2015) [11]. find that an asset transfer program in India led to a significant increase in the use of electricity as the main source of light echoing the presence of economic barriers to connection and electricity.

Abeberese (2012) [1]. uses data on Indian manufacturing firms to show that in response to an exogenous increase in electricity price, firms reduce their electricity consumption and switch to industries with less electricity-intensive production processes, meaning that electricity constraints may lead firms to operate in industries with fewer productivity-enhancing opportunities. In Uganda, Neelsen and Peters (2013) [21]. found that manufacturing firms were less inclined to connect to the grid or use decentralized electricity than service firms, because of the high investment costs of electric machinery coupled with sharp competition in the market for manufactured goods. Abeberese (2012) [1]. suggests that, in countries with high levels of electricity insecurity, firms may not be attracted to move to productivity-enhancing industries and grow larger since doing so comes with the cost of having to rely on electricity.

A study by Scott, Darko, Lemma and Rud (2014) [30]. used data from the Enterprise Surveys for six selected countries (Bangladesh, Nepal, Nigeria, Pakistan, Tanzania and Uganda) to assess the effect of electricity insecurity on the productivity of manufacturing MSEs and followed the approach taken in other studies using a production function and OLS regression analysis to determine the effects of electricity insecurity on firms' total factor productivity, cost-competitiveness, and investment. The analysis revealed that many firms which experience outages have lower productivity than firms which do not. This is shown when productivity is measured in terms of total factor productivity and output per worker, and when the measure of electricity insecurity is binary (outages/no outages). Cissokho and Seck (2013) [6]. obtained quite different findings in Senegal. Here, outages were found to have a positive and significant effect on the productivity of firms, and MSEs performed better than large-scale firms. The suggested explanation for this contradictory finding is that outages stimulated better management practices, which mitigated the negative effects of power supply interruptions, and that firms that were more inefficient and with lower productivity had gone out of business in the face of electricity insecurity (Cissokho & Seck, 2013) [6].

Mudi, Sakwa and Mukulu (2019) [20]. Investigated the effect of use of skills and knowledge due to rural electrification on the household well-being of proprietors of micro and small enterprises in Kenya. The study adopted descriptive survey design with a target population of 914,243 proprietors of micro and small enterprises in Kenya. The study established a significant positive relationship between use of skills and knowledge and household well-being among proprietors of micro and small enterprises in Kenya.

3. Research Methodology

This study was conducted using a cross sectional survey research design. Houser (2011) reiterates that a cross-sectional survey design provides in-depth information about the characteristics of subjects within a particular field of study. The design is useful in identifying characteristics of an observed phenomenon or exploring possible correlations among two or more phenomenon (Leedy & Ormrod, 2010) [17]. The target population for this study was 172,554 rural registered micro and small enterprises in Kakamega, Bungoma, Nakuru, Busia, Bomet, Siaya, Kericho and Kirinyaga Counties (Republic of Kenya, 2016) [26]. The decision to use the above named counties for this study was based on their contribution to national poverty as shown in Table 3.1

Table 1: Contribution to National Poverty by County

County	Total Population	Contribution (%)	Rank (Highest to lowest)
Kakamega	1,644,328	4.77	1
Bungoma	1,359,983	3.79	5
Nakuru	1,562,625	3.08	10
Busia	735,294	2.61	15
Bomet	721,873	2.18	20
Siaya	833,230	1.87	25
Kericho	737,942	1.71	30
Kirinyaga	520,585	0.79	45

Source: Republic of Kenya (2014).

The study adopted multistage sampling technique to select the sample size. Multistage sampling involves dividing the population into groups or clusters. This type of sampling is suitable for this study due to the large target population involved (Nafiu, 2012). In the first stage, systematic sampling was used to arrive at the choice of the eight counties based on their contribution to national poverty and county ranking as shown in Table 3.3.1. In the second stage, simple random sampling technique using random numbers was used to select the individual proprietors of MSEs from each of the counties involved in the study. This fulfilled the requirements of efficiency, representativeness, reliability and flexibility taking care of systematic bias that may result from non-respondents (Kothari & Garg, 2014) [15]. Since the target population is more than 10,000, the study used a sample population of 418 respondents for data collection based on Mason, Lind and Marchal (1999) [18]. formula. The main instrument for data collection was a structured questionnaire with a fixed set of choices designed with alternative answers expressed in a Likert scale style. Pilot study was carried out to evaluate the suitability of the questionnaires. Sample for the pilot study was obtained from proprietors of micro and small enterprises within Kakamega County, who did not make part of the sample population.

4. Research Findings and Discussions

The Cronbach's alpha revealed that the instruments had adequate reliability for the study. Electricity supply had good internal consistency, α =. 803; all the items were worth of retention. Deleting any of the items would not result to an increase in Cronbach's alpha.

4.1 Descriptive Statistics for Electricity Supply

Electricity supply was assessed through three main measures namely ease of electricity consumption, reliability of supply and affordability. To examine electricity supply, a nine-itemed Likert scaled questionnaire was used. The proprietors of MSEs rated the items using: 1=Strongly disagree, 2=Disagree, 3=Undecided, 4=Agree and 5=Strongly agree and their responses were converted into continuous scaled data by computing the mean response in each item. The findings were summarized as illustrated in Table 4.1.

Table 2: Electricity Supply

Statement	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1. Preference is given to less electricity-intensive businesses due to high tariffs.	50.5%	31.3%	11.6%	4.6%	2.0%
2. High electricity tariffs are the cause for cooking using solid and liquid fuels.	32.4%	53.4%	9.0%	2.9%	2.3%
3. The average monthly power bill exceeds 5% of the business income.	24.4%	52.1%	15.7%	5.2%	2.6%
4. Use of generators during outages increases the cost of electricity.	24.1%	45.3%	15.0%	9.4%	6.2%
5. Unreliable electricity supply has a negative effect on a firm's productivity.	34.5%	45.3%	14.0%	3.3%	2.9%
6. Interruption to power supply increases the cost of production through expenses of repair of damaged equipment.	65.5%	26.1%	3.2%	2.9%	2.3%
7. Electricity is used alongside other energy sources to optimize costs.	24.8%	60.6%	8.1%	5.5%	1.0%
8. There are other energy sources on standby in case of power blackout.	30.0%	51.8%	11.4%	5.25%	1.6%
9. Voltage fluctuation impacts negatively on business performance.	29.3%	57.3%	8.1%	3.3%	2.0%
N = 307					

The respondents were in agreement that electricity supply had a positive influence on household well-being among proprietors of MSEs. Respondents generally agreed that high electricity tariffs are the cause for cooking using solid and liquid fuels as exemplified by about 85% of those who participated in the survey. Use of charcoal as the predominant fuel for cooking among households connected to electricity could be linked to the facts that; electricity tariffs are high relative to income, and or unreliable electricity supply compelling households to seek out alternatives in order to maintain regular household routines. This agree with the finding by Neelsen and Peters (2013) [21]. that decisions by MSEs to connect to an electricity supply when it becomes available and their consumption of electricity are influenced by the costs involved.

4.2 Factor Analysis for Electricity Supply

The measures of electricity supply were subjected to factor analysis with principal component analysis as the extraction method. The method (PCM) as a technique of factor analysis approach enabled the researcher to identify and retain the factors with high statistical significance influence. Equally, PCM describes interdependencies among the items of a variable with an aim of identifying few factors which explains most of the information on the variable construct. The extraction of the factors follows the Kaiser criterion where an eigenvalue of 1 or more indicates a unique factor. The final results are presented in Table 4.2.

Table 3: Total Variance Explained for Electricity Supply

Component	Initial Eigenvalues.			Extraction Sums of Squared Loadings		
	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)
1.	3.564	39.601	39.601	3.564	39.601	39.601
2.	.987	10.970	50.571			
3.	.854	9.489	60.060			
4.	.784	8.713	68.773			
5.	.698	7.753	76.526			
6.	.639	7.104	83.629			
7.	.537	5.962	89.591			
8.	.473	5.251	94.843			
9.	.464	5.157	100.000			

Extraction Method: Principal Component Analysis.

Eigenvalues associated with each linear component (factor) before extraction, after extraction and after rotation are shown in Table 4.2. Before extraction, SPSS had identified nine linear components within the data set. The eigenvalues associated with each factor represents the variance explained by that particular linear component and it is

displayed in terms of percentage of variance explained. The nine measures of electricity supply were subjected to factor analysis and all the nine attracted coefficients of more than 0.4. Therefore, the nine (9) statements were retained for analysis. According to Rahn (2010), a factor loading equal to or greater than 0.4 is considered adequate. Further, the results showed that there was only one critical factor influencing electricity supply which accumulated to 39.601% of the Total variance in this construct. The main loadings in the single component were from items on ease of electricity consumption, reliability of supply and affordability all of which measured the degree to which electricity supply influenced household well-being among proprietors of MSEs. The three initial sub-concepts on affordability, reliability of supply and ease of electricity consumption were combined to form electricity supply. The single component was therefore named electricity supply.

Table 4: Rotated Component Matrix for Electricity Supply

Statement	Electricity Supply
1. Preference is given to less electricity-intensive businesses due to high tariffs.	.615
2. High electricity tariffs are the cause for cooking using solid and liquid fuels.	.741
3. The average monthly power bill exceeds 5% of the business income.	.507
4. Use of generators during outages increases the cost of electricity.	.593
5. Unreliable electricity supply has a negative effect on a firm's productivity.	.687
6. Interruption to power supply increases the cost of production through expenses of repair of damaged equipment.	.674
7. Electricity is used alongside other energy sources to optimize costs.	.561
8. There are other energy sources on standby in case of power blackout.	.586
9. Voltage fluctuation impacts negatively on business performance.	.667

Extraction Method: Principal Component Analysis.
a. 1 components extracted.

From the rotation matrix shown in Table 4.3, there was only one major factor combining the three initial sub-concepts of affordability, reliability of supply and ease of electricity consumption. This therefore implies that electricity supply is a composite concept that cannot be broken further. The mean of the scales constructed on the basis of the single factor of electricity supply, was checked using univariate descriptives under factor analysis. The results are presented on a scale of 1.0 to 5.0 in Table 4.4.

Table 5: Analysis of the Mean for Electricity Supply

Definition	Mean	SD
Electricity Supply	3.58000	.57323

Key: 1.00-1.80 = Strongly Disagree; 1.81-2.60 = Disagree; 2.61-3.40 = Neither Agree nor Disagree; 3.41-4.20 = Agree; 4.21-5.0 = Strongly Agree

The findings indicated that electricity supply was an important factor as indicated by a mean score of 3.5800 which lies in agree on the ranking scale. It's not surprising that electricity cost is an impediment to electricity consumption in developing countries like Kenya. The framework developed by the Sustainable Energy for All initiative considers 30 kWh per month to be the subsistence level for grid electricity. The framework considers electricity affordable if a household does not have to spend any more than five percent of its total monthly income to purchase it (IEA, 2015). A majority of the rural dwellers in Kenya are poor and may not afford to pay for electricity that is mistakenly considered a luxury due to the high tariffs. When a government policy seeks to promote access to renewable energy sources, it needs to influence factors such as: affordability, disposable income, availability and high quality of modern sources. This is in line with the findings by Millien (2017) [19]. that frequent outages in Kenya may be the reason for reluctance among households to subscribe, because they may consider the cost of service too high given its erratic availability, regardless of their specific budget constraints and by Drazu, Olweny and Kazoora (2015) [7]. that use of charcoal as the predominant fuel for cooking was a significant revelation in households connected to mains electricity.

4.3 Correlation Analysis for Electricity Supply

A Pearson Product Moment Correlation Coefficient was used, with scores on electricity supply and household well-being among proprietors of micro and small enterprises. The scores for both variables were converted into continuous scale by computing the mean responses per respondent, where high scale ratings implied low electricity supply and high household well-being and vice versa. The correlation analysis result was shown in SPSS output, as indicated in Table 4.5.

Table 6: Electricity Supply and Well-being

		Household Well-being
Electricity Supply	Pearson Correlation	.698**
	Sig. (2-tailed)	.000
	N	307

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

There was a strong positive (r=.698, n=307, p<.05) correlation between electricity supply and household well-being among proprietors of micro and small enterprises. This finding resonates with that by Millien (2017) [19]. who found a positive correlation between ability to connect to electricity and cost of installation in Kenya.

4.4 Regression Analysis for Electricity Supply and Well-being

To estimate the level of influence of electricity supply on

household well-being among proprietors of micro and small enterprises, a coefficient of determination (R Square) was computed. This was done using regression analysis and the results were as shown in Table 4.6.

Table 7: Electricity Supply and Well-being

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.759[a]	.576	.090	.61783

a. Predictors: (Constant), Electricity Supply

From Table 4.6, it can be seen that R-value is 0.759 which suggests that there is a strong positive effect of electricity supply on household well-being among proprietors of MSEs. It can also be observed that the coefficient of determination, the R-square (R^2) value is 0.576, which represents 57.6% variation of household well-being among proprietors of micro and small enterprises as a result of electricity supply.

To show the strength of the relationship between electricity supply and household well-being among proprietors of micro and small enterprises, a regression analysis was done. Analysis of the regression model coefficients is shown in Table 4.7.

Table 8: Regression Coefficients for Electricity Supply and Well-being

Coefficients						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
1		**B**	**Std. Error**	**Beta**		
	(Constant)	.162	.098		1.594	.000
	Electricity Supply	.358	.042	.419	7.940	.000

a. Dependent Variable: household well-being

Model: $Y=0.162+0.419X_1$

From Table 4.7, there was a positive beta co-efficient of 0.419 as indicated by the co-efficient matrix with a p-value =. 000 <. 05 and a constant of 0.162 with a p-value =.000<.05. Therefore, both the constant and electricity supply contribute significantly to household well-being. Consequently, the model can provide the information needed to predict household well-being from electricity supply. The regression equation is presented as follows: $Y=0.162+0.419X_1$; Where Y = household well-being and X_1 is electricity supply.

In view of the foregoing, the provisions of reliable, secure and affordable energy services in developing countries like Kenya may be key to addressing many of today's global development challenges including poverty, inequality, climate change, food security, health and education as well as wealth creation and economic development. This finding supports a study by Abeberese (2012) [1]. that revealed that the cost of electricity has a significant influence on its consumption. The finding also resonates with the result of a study by Neelsen and Peters (2013) [21]. that the cost of electricity is an important predictor for MSEs to connect to an electricity supply when it becomes available.

5.1 Conclusions and Recommendations

Descriptive statistics showed that electricity supply had a significant effect on household well-being. High electricity tariffs relative to income and or unreliable electricity supply compel poor households and MSEs to seek for alternative energy sources. According to factor analysis results, one factor explained most of the variance and was therefore the most important. The single factor was electricity supply which was from items on ease of electricity consumption, reliability of supply and affordability all of which measured the degree to which electricity supply influenced household well-being among proprietors of MSEs. The emergence of electricity supply suggests that for developing countries to realize the benefits of electrification as a driver of poverty reduction, there is need to find ways of reducing tariff levels and improving reliability of electricity supply.

Pearson correlation analysis revealed that there was a strong positive correlation between electricity supply and household well-being. A standard multiple regression analysis revealed that electricity supply contributed significantly to the explanation of household well-being. Given that the regression results demonstrated a significant relationship between electricity supply and household well-being, the null hypothesis that electricity supply has no effect on the household well-being among proprietors of micro and small enterprises in rural Kenya was therefore rejected and it was concluded that electricity supply indeed had an effect on household well-being. This therefore implies that an increase in electricity supply enhances the level of well-being among proprietors of micro and small enterprises.

The study concluded that electricity supply had a positive significant effect on the household well-being among proprietors of micro and small enterprises. It was therefore concluded that the cost of electricity should be reviewed downwards by reducing taxes or giving exemptions for small scale electricity consumers including micro and small enterprises. To enhance supply and reduce the cost of electricity, there is need to expedite the enactment of National Energy Policy to bring clarity on key issues such as the procedure for mini-grid - main-grid interconnection in order to reduce the regulatory burden for the mini-grid developers in part by providing guidelines for the use of national funds for mini-grid development and clarifying the national electrification strategy. There is also need to establish long term schemes to finance initial or upfront costs for acquiring grid electricity, which is an impediment to electrification in rural areas.

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