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EFFECTS ON RURAL ELECTRIFICATION FINANCING WAY LEAVES ACQUISITION AND VANDALISM CHALLENGES ON THE LIVELIHOOD OF RURAL HOUSEHOLDS IN KENYA : A CASE OF NANDI COUNTY KENYA

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Abstract

Purpose: The purpose of this paper is to establish the effects on rural electrification financing way leaves acquisition and vandalism challenges on the livelihood of rural households in Nandi County, Kenya.

Methodology: The study adopted a descriptive research design. The target population was 9788 households who were connected to electricity and 2212 households who were not connected to electricity s. A total of 384 respondents were interviewed to help enrich the data gathered. The analysis of data was done through descriptive and inferential statistics.

Results: A conclusion is made that rural electrification financing, rural electrification vandalism and rural electrification way leave acquisition have impact on livelihoods in rural households in Nandi County.

Unique contribution to theory, practice and policy: From the study findings, the government should consider subsidizing the connection cost. The government should also link up with donors like World Bank who have already acknowledged through their own studies the need for massive injection of funds to support rural electrification projects. Secondly, project implementers need to build in community participation in their project designs, implementation and other decision-making processes.

Key words: *Rural electrification, financing, way leaves acquisition, vandalism, livelihood, rural households, Nandi County*

1.0 Introduction

1.1 Background of the study

Despite the numerous accepted and recognized benefits derived from rural electrification, most developing nations are still struggling with low electrification rates. As per the International Energy Agency's (IEA) research studies, as of 2012 more than 1.3 billion people lacked access to electricity globally. The case was worse in rural areas, as 85% of this population lived in rural areas (IEA, 2012). As of 2013, another report by IEA showed that roughly 70% of the population of Sub-Saharan people lived without electricity as most households lacked electricity connections (IEA, 2013). Electrical energy is a vital phase to a country's human socio-economic well-being and socio-economic development. In Kenya rural electrification has been implemented by government agencies namely Kenya power and Rural Electrification Authority with a target to connect all public primary schools by July 2015. A large amount of resources is being committed toward these rural electrification projects in order to improve household connectivity with a target of 75% by 2018 (Kenya power, 2014). Household electricity connectivity in Kenya is about three million with that in rural areas being lower than that of urban areas. Lack of electrification in rural areas impact close to 90% of the population. According to a recent survey by (KNBS, 2013), the percentage of Kenyan household connected to electricity was 22.9% with 51.4% in urban areas and 5.2% in rural areas. In Nandi County, the connectivity was at 6.2% which is extremely low.

1.2 Statement of the Problem

Kenya power has undertaken a number of rural electrification projects in a bid to improve the connectivity in rural areas. A considerable quantity of resources has been disbursed on such projects, an average of 1.6 million each with an expectation that it would translate into increased connectivity by households (Tanui, 2015). Household electricity connectivity in Kenya is about three million with that in rural areas being lower than that of urban areas. Most of the population in Kenya lives in countryside. Lack of power supply in rural areas affects around ninety 90% of the population (Abdullah and Markandya, 2012). According to a recent survey by (KNBS, 2013), the percentage of Kenyan household connected to electricity was 22.9% with 51.4% in urban areas and 5.2% in rural areas. In Nandi County, the connectivity was at 6.2% which is extremely low.

Most studies in the current body of knowledge Karambu (2013), Albouy (2011), Bongani (2013) and Abdullah and Markandaya (2007) concentrates on intricate of and issues as an impediment to rural electrification. Of all these studies, the element of challenges of rural electrification in the livelihood of rural household has not been addressed. The purposes of this research study was to fill the research gap by determining the challenges of rural electrification financing, way leaves acquisition and vandalism on the livelihood of the people in Nandi County.

1.3 Research Question and Hypothesis

The study was based on the following research questions:

i. How does rural electrification financing influence the livelihoods in rural households in Nandi County?

ii. What is the influence of rural electrification vandalism on the livelihoods of rural households in Nandi County?

iii. How does rural electrification way leaves acquisition influence the livelihoods of rural household in Nandi County

iv. What is the moderating effect of government policies on challenges of rural electrification financing, way leaves acquisition and vandalism in the livelihood of rural household in Nandi County Kenya?

The following null hypotheses were used to test the challenges of rural electrification financing, way leaves acquisition and vandalism on the livelihood of the people in Nandi County.

$H0_1$: Rural electrification financing does not affect the livelihoods in rural households in Nandi County.

$H0_2$: Rural electrification vandalism does not affect the livelihoods in rural households in Nandi County

$H0_3$: Rural electrification way leaves acquisition does not affect the livelihoods in rural households in Nandi County.

HO_4: Government policies do not significantly moderate effect of rural electrification financing way leaves acquisition and vandalism in the livelihood of rural household in Nandi County Kenya

1.4 Purpose and Scope of the Study

The study will focus on the challenges of rural electrification financing, vandalism and way leaves acquisition on the livelihood of rural household in Nandi County Kenya. There are approximately 9788 households who are connected to electricity and 2212 households who are not connected to electricity in Nandi County (KNBS, 2016). The study will focus on 12000 households in Nandi County. The target population was the households connected to electricity and those that were not connected to electricity. The study was conducted in 2018.

2.0 THEORETICAL AND EMPIRICAL REVIEW

2.1 Theoretical Review

The study was underpinned by the stakeholder theory advanced by Edward Freeman in 1994. The essential thought of stakeholder theory is that firms have associations by numerous essential team and that is able to induce and keep up the help of the team by seeing and adjusting their important advantages (Kirsi, 2010). Kirsi (2010) additionally illustrated four principles of the stakeholder

theory ; enterprises have associations with several integral stakeholders that are inclined by its choices, this theory is likewise concerned about the idea of these relationships as far as the two procedures and results for the firm and its stakeholders, that the interests of every single legitimate stakeholder have inherent esteem and not one arrangement of interests is expected to rule others, lastly the theory centers around managerial decision making. In view of the contention of instrument of power of this theory, an organization applying stakeholder method will have increased performance as far as financial and economic aspects are concerned.

Kirsi (2010) noted that while having its base in strategic management, stakeholder theory has been connected to various fields, exhibited and applied in various ways that are very particular and includes altogether different techniques, ideas, sorts of proof and criteria of assessment. Thus, Mantey (2013) after analysing the stakeholder theory reasoned that the help of key partners was basic for project achievement and subsequently the accomplishment of projects. In connection to the examination the theory can be connected in that managers of REP need to deal with the organization for the benefit of its stakeholders.

2.2 Empirical Review

2.2.1 Rural Electrification Financing

United Nations Development Program (2013) found out that the sheer cost of electrification means rural households require suitable instruments to fund it. Notwithstanding, this financing is probably not going to emerge without critical changes. The latest forecasts from the International Energy Agency (IEA) inconspicuously, yet plainly, underline that huge number of the individuals of living in rural areas will not be connected to electricity soon. In anticipating the future, the IEA assessed that just about 1 billion individuals will at present be without power by 2030. The IEA likewise evaluated that $1 trillion would be required for all inclusive access to vitality and power somewhere in the range of 2010 and 2030, a normal of $50 billion every year. Starting at 2009-2010, notwithstanding, just 3 % of this required venture has been conferred. On a yearly basis, interests in financing zap should be increase by in excess of five times.

A study by Abdullah and Markandya, (2011) on rural electrification programmes (REP) in Kenya indicates that the initiative has faced setbacks due to high connection costs. The willingness to pay to be connected to electricity power is less due to high cost which the government requires to cater for reforming the energy sector by giving subsidies. The Kenyan electrification rate in rural areas is 14% which far underneath the sub Saharan Africa level of 23 % (Abdullah, 2011). Absence of enough capital in rustic zones has prompted poor electrification as the cost increments with remove from the matrix, which influences connection with cost in urban zones less expensive than in rural areas. In Kenya wood fuel gives up to 70% of the energy industry aside from transport and business resolutions. This has led to high indoor air pollution (Abdullah, 2011).

2.2.2 Rural Electrification Vandalism

According to Brian (2013) power supply disruptions caused by the transformer vandalism have become very difficult to predict hence difficult to control. A lot of resources have been put in place in engaging security services leading to a lot of arrests but the syndicates appear difficult to dismantle due to weak legislation and the law enforcers have no capacity or knowledge to understand the socio-economical implication of theft and vandalism more secret obstruction is burglary and destruction of power supply equipment. For instance, in Papua New Guinea, sun based units sent to schools have been inclined to bizarrely high rates of vandalism, harm, and robbery. Under a *wantok* framework established in innate conventions, families there share resources. Solar panels, which advantage a specific school, strike this arrangement of *wantok*. Innate people group have along these lines crushed several solar panels or, more regrettable, undermined their proprietors.

Stealing of electricity poles is widespread and is now deterring power supply to many parts of the country. The Government is currently implementing rural electrification projects in all constituencies in the country. Ministry of Energy statistics show that over 60 per cent of essential institutions like public schools and health centres have no electricity. To reverse the situation, the Government set aside Sh2.5 billion for rural electrification every year. But the rising theft cases of electricity poles, cables and other equipment is frustrating the implementation and success of the projects. The most hit areas include Western, Nyanza, Rift Valley and Nairobi provinces. The pace of supplying power to new clients has been slowed down and sometimes it's taking up to three months to connect customers because of the time taken to order more poles for the affected areas.

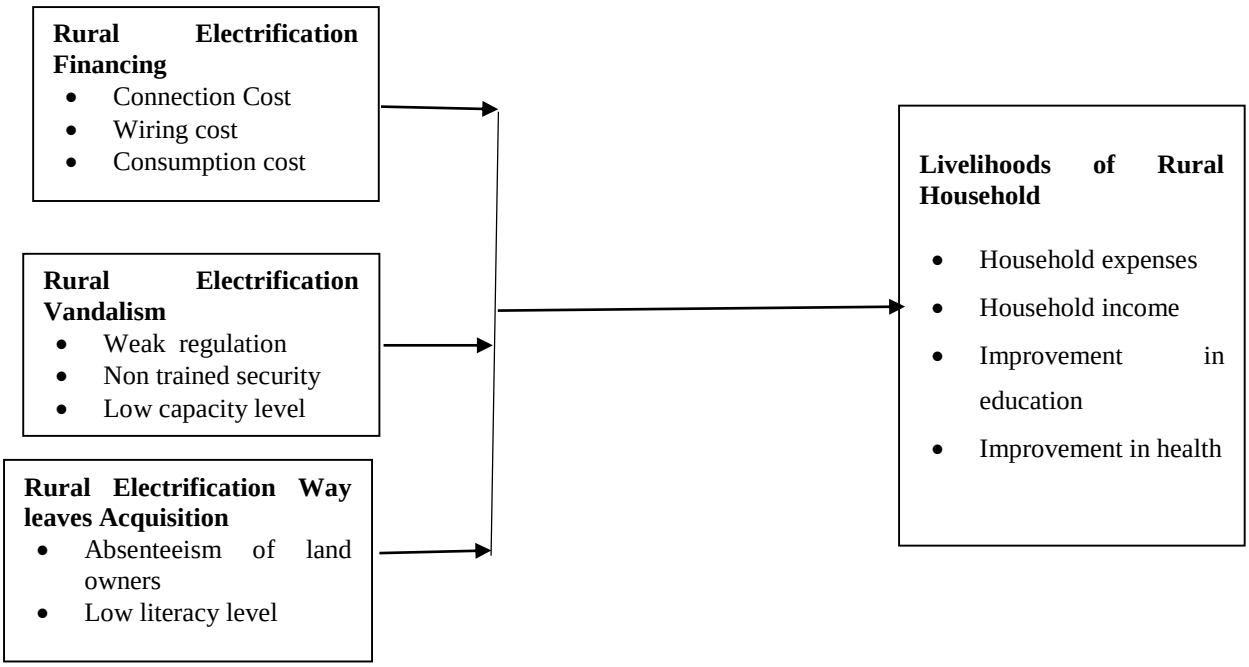
2.2.3 Rural Electrification Way leaves Acquisition

A study conducted by the World Bank in the Philippines revealed that small home businesses were more active in areas with electricity (World Bank, 2014). Rural electrification has the potential of improving the quality of life of rural life in various ways. The energy demand is rapidly growing throughout the developing world where there is increased need for energy to support various services like domestic and small scale services (Barnes, 2012). In order to enhance electricity access to rural areas, several of the developing countries have undertaken a number of policy and institutional initiatives.

Karambu (2013) researched on how intricate land issues are delaying priority projects and found out that challenges in obtaining concessions from those owning land to permit for the laying of cables, pipes and power lines is adjourning the setting up of crucial infrastructural projects, which is denying millions of Kenyans to be connected to electricity. The affected sectors include energy, water and telecommunications where industry operators have reported incurring losses to the billions due to challenges in acquiring way leaves. Sixty per cent of projects initiated by Kenya Power, for instance, have stalled for certain periods as the company strived to acquire way leaves for construction of power distribution lines. Out of those, only 40 per cent were completed. "Way

leaves are a major concern. We deal with individuals, institutions and now county governments; the process can take up to six months owing to several issues. As a result of such delays, the firm has incurred millions in financial costs associated with acquisition of wayleaves and compensation to contractors for time lost during the long negotiates.

2.3 Conceptual Framework



3.0 RESEARCH METHODOLOGY

The study adopted a descriptive research design. The target population was 9788 households who were connected to electricity and 2212 households who were not connected to electricity s. random sampling technique was used .A total of 384 respondents were interviewed to help enrich the data gathered. This study used primary data which was collected through the use of structured questionnaires. Data from the questionnaires was analyzed using Statistical Package for Social Science (SPSS) version 20 to derive descriptive results.

4.0 RESEARCH FINDINGS AND DISCUSSIONS

4.1 Demographic information

The number of questionnaires that were administered to householders in Nandi County were 384. A total of 340 questionnaires were properly filled and returned. This represented an overall successful response rate of 88.50%. Majority of the respondents who were 69% indicated that they

were male while only 31% were females. The results indicated that 42% were between 36 – 45 years, 40% were between 26 – 35 years, 10% were between 18 – 25 years while only 8% were 45 years and above. Majority of the respondents who were 55% indicated secondary certificate, 35% indicated diploma, 5% undergraduate while 5% also indicated post graduate. The results further indicated that 1.2% of the respondents were earning between sh 501-1000, 3.9% of the respondents were earning between sh 10001-1500, 2.1% of the respondents were earning between sh 1500-2500, 22.9% of the respondents were earning between sh 2500-5000, 23.2% of the respondents were earning between sh 5000-7500, 27.6% were earning between sh 7500-10,000 and 19. % of the respondents were earning above sh 10,000.

4.2 Descriptive Statistics

Majority of 84% (57.1%+26.5%) of the respondents agreed with the statement that theft of electricity poles has become rampant in the community, 69% agreed that there are supply disruptions caused by the transformer vandalism, 82% agreed that the pace of supplying power to new clients has been slowed down due to the increased vandalism, 70% agreed that a lot of resources have been put in place in engaging security services, 86% agreed that the transformer vandalism is difficult to predict hence difficult to control. the mean average of the responses was 1.86 which means that majority of the respondents were agreeing with most of the statements on livelihoods in rural households; additionally, the responses were varied as shown by a standard deviation of 1.03.

4.3 Inferential Statistics

4.3.1 Correlation Analysis

Correlation analysis was conducted to quantify the relationship between the independent variables (rural electrification financing, rural electrification vandalism and rural electrification way leaves acquisition) and the dependent variable (livelihoods in rural households). The results indicated that rural electrification financing and livelihood in rural households are positively and significantly associated ($r=0.611$, $p=0.000$). The table further indicated that rural electrification vandalism and livelihood in rural households are positively and significantly associated ($r=0.517$, $p=0.000$). It was further established that rural electrification way leave acquisition and livelihood in rural households are positively and significantly associated ($r=0.633$, $p=0.000$).

Table 1: Correlation Results

		Livelihood in rural households	Rural electrification financing	Rural electrification vandalism	Rural electrification way leave acquisition
Livelihood in rural households	Pearson Correlation	1.000			
	Sig. (2-tailed)				
Rural electrification financing	Pearson Correlation	.611**	1.000		
	Sig. (2-tailed)	0.000			
Rural electrification vandalism	Pearson Correlation	.5.17**	.4.88**	1.000	
	Sig. (2-tailed)	0.000	0		
Rural electrification way leave acquisition	Pearson Correlation	.633**	.546**	.744**	1.000
	Sig. (2-tailed)	0.000	0	0	

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

4.3.2 Regression Analysis

Rural electrification financing, rural electrification vandalism and rural electrification way leaves acquisition provide a moderately good fit in predicting changes in livelihoods in rural households. This is supported by coefficient of determination also known as the R square of 68.8%. This means that rural electrification financing, rural electrification vandalism and rural electrification way leaves acquisition explain 68.8% of the variations in the dependent variable which is livelihoods in rural households. The results are presented Table 2.

Table 2: Model Summary

Indicator	Coefficient
R	0.829
R Square	0.688
Adjusted R Squared	0.671
Std. Error of the Estimate	0.29546

Table 3 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant. Further, the results imply that the independent

variables are good predictors of performance. This was supported by an F statistic of 11.902 and the reported p value (0.000) which was less than the conventional probability of 0.05significance level.

Table 4: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	23.49	3	7.83	11.902	.000
Residual	49.997	337	0.658		
Total	73.488	340			

Regression of coefficients results in table 5 shows that rural electrification financing and livelihoods in rural households are positively and significant related (β =0.294, p=0.003). The table further indicates that rural electrification vandalism and livelihoods in rural households are positively and significant related (β =0.387, p=0.002). It was further established that rural electrification way leaves acquisition and livelihoods in rural households were positively and significantly related (β =0.345, p=0.008).

Table 5: Coefficient Results

Model	β	Std. Error	t	Sig.
(Constant)	-0.156	0.585	-0.267	0.79
Rural electrification financing	0.294	0.096	3.08	0.003
Rural electrification vandalism	0.387	0.118	3.269	0.002
Rural electrification way leaves acquisition	0.345	0.127	2.711	0.008

Thus, the optimal model for the study was;

$Y = \beta 0 + \beta 1X_1 + \beta 2X_2 + \beta 3X_3 + \epsilon$

$Y = -0.156 + 0.294X_1 + 0.387X_2 + 0.345X_3$

Where;

Y-Livelihoods in Rural Households

X1-Rural Electrification Financing

X2-Rural Electrification Vandalism

X3-Rural Electrification Way Leaves Acquisition

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

The study sought to investigate the effects on rural electrification financing way leaves acquisition and vandalism challenges on the livelihood of rural households in Nandi County Kenya. A total of three hundred and eighty four questionnaires were distributed to the selected respondents who were living in Nandi County. Out of the population covered, three hundred and forty were properly filled and returned representing a response rate of 88.50%. The correlation results indicated that rural electrification financing and livelihood in rural households were positively and significantly associated. The regression results showed that there was a positive and significant relationship between rural electrification financing and livelihoods in rural households as supported by a p value of 0.003 and a beta coefficient of 0.294. The regression results showed that there was a positive and significant relationship between tax rate and tax compliance as supported by a p value of 0.002 and a beta coefficient of 0.387. The regression results showed that there was a positive and significant relationship between rural electrification way leaves acquisition and livelihoods in rural households as supported by a p value of 0.345 and a beta coefficient of 0.008.

5.2 Conclusions

The study concluded that there is a positive and significant association between rural electrification financing and livelihoods in rural households. Further, from the regression results the study concluded that rural electrification financing have a positive and significant influence on livelihoods of rural households in Nandi County Kenya. The study also concluded that there is a positive and significant association between rural electrification vandalism and livelihoods of rural households in Nandi County. Further, from the regression results the study concluded that rural electrification vandalism has a positive and significant influence on the livelihoods of rural households in Nandi County Kenya. Additionally, the study concluded that there is a positive and significant association between rural electrification way leave acquisition and livelihoods of rural households. Further, from the regression results the study concluded that rural electrification way leaves acquisition have a positive and significant influence on the livelihoods of rural households in Nandi County Kenya.

5.3 Recommendations

The government should consider subsidizing the connection cost. The government should also link up with donors like World Bank who have already acknowledged through their own studies the need for massive injection of funds to support rural electrification projects. Project implementers need to build in community participation in their project designs, implementation and other decision-making processes. The government should compensate households who provide way leaves for establishing power cables and poles. Further research to be carried out on the influence of rural electrification projects on living standards and methods of production and also on

strategies that can be employed to lower electricity connection costs without putting the utility firms at a loss.

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