

RISKS ON THE RURAL ELECTRIFICATION PROJECT IMPLEMENTATION PERFORMANCE IN MUKURWE-INI SUB-COUNTY, NYERI COUNTY, KENYA

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ABSTRACT

Rural electrification is a central cornerstone in poverty alleviation and is the first step of modernization. It requires the resilient commitment of resources owing to its nature of high start-up costs especially in capital expenditure. It has facilitated major economic progress in the industrial and business environments especially in rural areas. In the recent past, there has been notable and substantial progress made towards providing electricity access in Kenya. Despite this being the case; electricity uptake is still an ongoing challenge locally. There has been a growing gap in electricity uptake between the urban population and rural population attributed to unequitable distribution of electrification projects. This study seeks to examine the effect that project risks have on the rural electrification project performance in Mukurwe-ini Sub County, Kenya. Specifically, this research inquiry will seek to; examine effects of financial risks, economic risks, organizational risks and technical risk on rural electrification project performance in Mukurwe-ini Sub County, Nyeri County. This study was informed by the systems theory, stakeholder theory and the planning theory and adopted a descriptive research scheme. Stakeholders in all the eleven electrification projects in the four wards of Mukurwe-ini Sub-County constituted the study population. In each project, the study targeted the project heads, respective section heads and the employees working in the projects. Further, representatives from KPLC, REA, National government, county government and local

administration were also targeted. Therefore, the study targeted representatives from various departments, community members, local administration, national and county government officials and contractors and subcontractors making a total of 77 respondents. The study used a census approach and therefore all the 77 respondents took part in the study. A pilot study test was done prior to undertaking the actual data collection for this study to ensure reliability and validity of data collected. This study made use of raw data by administering structured forms to the respondents. The data collected was analysed using descriptive and inferential statistics. Data collected was presented in pie charts and tabulations in summary for presentation and comparison. The study established that project risks had a negative relationship with performance of rural electrification projects in Mukurwe-ini Sub-County, Nyeri County, Kenya. The study concluded that the rural electrification project faced significant number of risks ranging from inadequate funding, vandalism of power infrastructure, debts, to high operational costs. It was concluded that the project faced economic risks ranging from political uncertainties, inflation, unfavourable government policies and cost of electricity which affected the performance of rural electrification projects in Mukurwe-ini-in Sub-County. The study concluded that organizational risks negatively affected the performance of rural electrification projects in Mukurwe-ini Sub-County, Nyeri County. The study concluded that the projects faced technical risks mainly limited capacity, managerial competence,

ICT skills and low staff competency which negatively affected performance of the projects. The study recommends that the projects need to ensure diligent management of debt, improve project funding and improve operational efficiency to reduce financial risks. The study mainly

recommends that projects need assessment of the risks they are subjected to, prepare, control and mitigate them to improve project performance.

Key Words: *rural electrification project, implementation, performance, Mukurwe-ini Sub-county, Nyeri County, Kenya*

INTRODUCTION

Electrification is one of the reliable source of energy proving to be a core input in the corporate world by facilitating major processes in the industrial and business environment. Besides lighting, electrification has improved business performance, thereby providing employment opportunities and subsequently contributing to poverty reduction and alleviation. It has the benefits of entertainment and information provision through various ways of mass media (Chang, Hwang, Deng & Zhao, 2018). These benefits extrapolate to the rural areas by improving the quality of life and opening opportunities for growth and development of societies. In Kenya, the main intent of the rural electrification programme is to increase electricity uptake and provide reliable electricity in rural areas with the aim of spurring rural economic development (European Union International Cooperation and Development [ICD], n.d.).

International development institutions especially so the World bank have been pivotal in rural electrification projects by financing power generation, transmission, and distribution to the Asia, Latin America and African continents. In this respect, rural electrification in Africa is a major development project which has further been undertaken by the governments of respective economies in an aim of improving the welfare of its citizens where, over half a billion people have no access to electricity (Lee, Brewer, Christiano, Meyo, Miguel, Podolsky & Wolfram, 2016).

According to Hopkinson, (2017), project risk is the uncertainty that may affect project delivery. There are many risks that are associated with the implementation of a rural electrification project. Financial risks is one of the major contrarians affects several implementing organizations. These risks can be as a result of a change in project requirements which will subsequently lead to a change in budgets. According to Kareithi and Muhua (2018), a change in competition structure and consumer preferences are threats that affect project performance. These factors include cost of production and availability of alternative sources of product are a major challenge.

Project risks affect aspects of project delivery and performance. Due to the importance of finances from planning to the process of project implementation, financial risks form the most significant factor that may affect project performance. Ohiare (2015) identified that financial

constrain as a major factor in the implementation of a rural electrification project. Projects are further affected by ever changing technologies, infrastructural related events and policy formulation and changes. Availability of these factors can directly or indirectly lower project performance.

Rural electrification projects are formed to improve the living standards of communities. Its effectiveness is thus measured by the benefits the community accrues economically and socially. For example, the community residents can measure the economic value of such projects through their ability to access alternative sources of goods and products.

Various ways have been suggested to mitigate risk mostly dependent on the nature of the project. For example; the government, in implementing education projects, provides subsidised goods (such as books and learning infrastructure) and services (such as teaching and support staff). Time is also a very crucial aspect in project management. Various scholars have provided ideas on how time management should be done for better effectiveness such risk documentation to reduce time wastage. Further, processes of identification, analysis, response, control and monitoring risk is crucial to mitigating risk. The government should step in to formulate policies that are more favourable for project implementation.

STATEMENT OF THE PROBLEM

National government through the Kenya Rural Electrification Programme has played an important part in rural electrification aimed at improving the living standards. However, implementation of rural electrification projects in the program have been challenging to stakeholders in the programme with only a 36% of rural electrification uptake (REA, 2017). This is a clear indication that there is a poor uptake of electricity among the rural populations and therefore benefits accrued from electrification projects are limited to them. Furthermore, the slow connection rate indicates that there are serious factors hindering the rural electrification programme. A report examining government projects indicated that there was 48.01% and 87.1% overrun in cost and timelines respectively associated with the rural electrification project (Ngacho & Das, 2016). The cost and time overruns led to a substantial waste or misuse of resources. These statistics cement the fact that, it is highly probable that the electrification project faces serious project risks that have led to a variance in project performance. Studies have been done on rural electrification project performance. Gregory and Sovacool, (2019) conducted a study examining the correlation between finance related risks and electricity infrastructure. This study was conducted in Kenya, Mozambique and Tanzania in respect to their electricity sectors. The study hypothesised that lack of infrastructure development affect regional investment levels due to uncertainties or risks. Mwihi (2015) focused on accessibility to rural electrification in Naivasha. Mwiti (2014) focused on the influence of rural electrification on poverty reduction whereas Ogalo (2011) focused his study on factors impacting electricity distribution in Nyamarambe, Kenya. However, there exists a knowledge gap since only few

studies have focused on project risks influences on the rural electrification project performance. This study's focus on project risks on rural electrification project performance sought to fill the gap identified.

GENERAL OBJECTIVE

This study's prevalent aim was to examine project risks on a rural electrification project performance in Mukurwe-ini Sub County.

SPECIFIC OBJECTIVES

1. To determine influences that financial risks have on rural electrification project performance in Mukurwe-ini sub county.
2. To establish economic risk influences on rural electrification project performance in Mukurwe-ini sub county.
3. To examine organisational risk effects on rural electrification project performance in Mukurwe-ini sub county.
4. To evaluate technical risk effects on the rural electrification project performance in Mukurwe-ini Sub County.

THEORETICAL FRAMEWORK

Systems Theory

Systems theory as advanced by Bertalanffy (1920) identifies a system as a set of objects or entities that are interrelated to form a whole. Bertalanffy (1920) in reference to a system explained that a system as a components that exist in interrelation within themselves and the environment. The system theory identifies processes necessary in projects; the process which is the Input – process – output. A project is a complex system and starts from the input stage, through the actual process and ultimately relays the outcome as the output (project cycle). This system is important in the entire project cycle (Yamin & Sim, 2016).

The basic elements of a project include the project manager, team, stakeholders, beneficiaries and resources. These elements relate and interact with each other making each project unique. When one element in the project is altered, the other elements are likely to also change since they are interrelated (Kerzner, 2017). The project, exists in the environment of an organizational structure and relates with both its internal and external environment. This relationship is likely to determine the project's outcome. For instance communication channels are important for the project as a system to exchange information within and external to its environment (Getachew & Kahsay, 2016).

Systems theory applies to this study; by taking the view of the rural electrification project as a system which has risk management as a subsystem. This theory has instrumentally been used in this research work to link the influence that risks have Vis a Vis rural electrification project performance in Mukurwe-ini Sub County.

The Stakeholder Theory

The stakeholder theory was first coined by an author known as Freeman (1984) when he identified stakeholders as individuals or class of people who get influence or get influenced by the project environment. Freeman was of the view that a management that looks into clients' needs and stakeholders wants tends to register improved or exemplary performance during a project's implementation (Kinyua, 2016).

According to Freeman (2010) stakeholders are the group of individuals/firms/companies who perform a central role in the implementing firm. Stakeholders in a project context would thus comprise of the beneficiaries (including the community), suppliers, project team, donors and government departments. There are both internal and external stakeholders. They influence and mobilize power and resources such as finances and labour. There is need for the project team to exercise in-depth stakeholder examination in order to identify the stakeholders and their influence or power in the project, how they affect or are affected by the project, and strategies to manage the expectations of each stakeholder (Golder & Gawler, 2005). Project success largely depends on meeting the interests of key stakeholders.

Blattberg (2013) has criticized the theory for expecting that the interests of different partners can be, in the best case scenario, bargained or adjusted against each other. Blattberg contends that, ".....this is a result of its accentuation on transaction as the main method of exchange for managing clashes between partner interests." He is of the view that, project managers should strive promote discussion as opposed to transaction. Consequently, he strives to promote an 'enthusiastic' origination of the partnership in relation to the stakeholder theory.

In the event that the stakeholders to a project are dissatisfied, the implementation of the project would be in jeopardy. This theory strongly advises that stakeholder involvement in project planning be taken into consideration in the planning process in order to ultimately avoid the events which materialize risks such as lack of capital/funds. This theory informed the relationship between risks associated with the implementation of the rural electrification project. The study took the view that stakeholder in the project are of great influence to project performance. This informed the reason for the researcher to include all individuals concerned with the projects implementation either directly or indirectly and did not limit the study to direct implementers (for example KPLC); but collected views of community members, local administration and financiers into view.

Planning Theory

According to the Project Management Body of Knowledge (PMBOK, 2019), this theory is derived from different knowledge areas or processes.’ The planning theory process are split into core process and facilitative processes. (Neufville 1983). Core processes include; activity definition and sequencing, duration estimates, scope planning and definition, schedule structuring, planning for resources, budgeting for costs and project plan development. Outputs derived from the core processes form the executing operations of project implementation (Innes & Booher, 2015).

Friedmann (2008) puts emphasis on the planning processes emphasizing that it is all about what is to be done or accomplished and why. Planning process needs to be clearly spelt out in order to realize the ultimate project goals. In complex organizations, with multiple projects, each project competes for the available resources and the project manager must therefore have high quality and detailed plans with cost and schedule information to support requests for resource allocation. Martin and Miller (1982) also draws some interesting insights that project planning is a way communicating to all stakeholders, as it informs the interests of the stakeholders through the plan and thus the management is in a better position to attract funding and support from them. A good project plan is developed through a consultative process that includes the project manager, the team and key stakeholders. This study was informed by this theory by taking into account the core activities in the planning theory during the study duration. The use of time scheduling and budgeting processes are examples of how this study was informed by the above theory.

This theory is criticized as being normative and is unable to explain the design of planning processes (Koskela & Howell, 2002). However, in this study this theory has been specifically used to inform the study by giving solutions to how project risks can be mitigated in the rural electrification project’s implementation.

EMPIRICAL REVIEW

Financial Risks and Rural Electrification Project Performance

Gregory and Sovacool, (2019) conducted a study on the effect of financial risks and business inhibitors to electricity uptake. This study was conducted in Kenya, Tanzania, and Mozambique. The study hypothesised that lack of infrastructure development affected regional investment levels due to uncertainties or risks. The study established that the financial capability of the organization significantly influences its operation. This study therefore recommended that organization should conduct adequate survey to determine the correct estimated amounts required by the whole project.

Kareithi and Muhua (2018) took a case study in Nyeri County examining the factors affecting the rural electrification programme in Kieni, Kenya; using a descriptive methodology

specifically a survey research design. This research work made interesting findings. Alternative power sources, electricity demand financing and cost of electricity uptake were the major associated risks that posed a challenge to the rural electrification project in focus. Carefully looking into the mentioned aspects could fundamentally lead to success in the rural electrification programs' implementation.

Ohiare (2015) also analysed the expanding electricity access to all in Nigeria by looking at the spatial planning and analysing the cost. The results underscored that financial constraint is a major risk influencing the effective rural electrification. It was projected that, in order to provide electricity access to about 28.5 million households by 2030, an estimated total cost of 34.5 billion dollars investment is required. Ohiare and Soile (2012) sought to analyse the financing rural energy projects in China. The study applied a case study research design. The findings drawn were compared with the study focusing on Nigeria. The study discovered that price (resulting to inflation) was one of the factors that was needed to be put into consideration and thus the need for a managed pricing regime structure regulating price increases with the aim of offsetting inflation as the project implementation appeared sensitive to inflation rates.

A study by Siringi and Lucky (2018) on the effects on rural electrification financing way leaves acquisition and vandalism challenges on the livelihood of rural households in Nandi County, Kenya, concluded that rural electrification financing, rural electrification vandalism and rural electrification way leave acquisitions are the risks associated with the electrification in rural households in Nandi County. Unique contribution to theory, practice and policy: From the study findings, rural electrification financing, rural electrification vandalism and rural electrification way leave acquisitions were found to have an impact on livelihoods in rural households in Nandi County.

Economic Risks and Rural Electrification Project Performance

Onzia and Muturi (2015) analysed the risk factors that influence effective implementation of rural electrification program in Uganda. Findings established program funding and cost of electricity influences the rural electrification programs positively and significantly. In conclusion the study underscored high connection fees coupled with tariffs are the risks/problems associated with electrification in West Nile region. In addition, Uganda experienced disconnections owing to lack of payment of bills and amounts owed to the implementing agency leading to among other risks the presence of micro economic challenges for the organisations.

Mwihaki (2015) sought to examine the factors influencing accessibility of rural electrification in Naivasha Constituency using a survey design. The researcher found that the Rural Electrification Authority has adequate policies to facilitate its performance on the provision of rural electrification but lacks sufficient funding and monitoring. She goes ahead to state, "the rural electrification authority..... Is as well faced by limited public participation." The study's

recommendations included community participation in their projects to enhance community ownership and ensure sustainability. In so doing, the community gets to have a sense of responsibility and ownership and will be able to account for their own project by monitoring and maintenance. In addition, the Rural Electrification Authority needed to ensure they have the skills needed for community mobilisation and public relations. She went ahead to recommend that the Rural Electrification Authority builds in continuous monitoring programs as an integral part of their projects and that lessons learnt are properly documented and used to inform future projects.

Marete (2016) sought to establish the influence of alternative energy sources, proximity to distribution grid, involvement of rural households and demand for electrification of households using a descriptive research design. The findings revealed that the economic status of households and alternative sources of energy had the most significant influence on the electrification of rural households. It is, thus, clear that the amount of funding to REA, availability of alternative sources of energy, distance of a household from a transformer and ability to pay have an influence on the rural electrification.

Ngubane and Nephawe (2014) aimed to investigate the factors that are affecting rural electrification within a South African municipality. The research used a qualitative research approach and the results profoundly indicated that the rural electrification project in the municipality was ineffective due to incompetence on the part of project managers and service providers, inadequate funding, low remuneration, high staff turnover, skills shortages, inefficient tendering processes and minimal community support.

Organizational Risks and Rural Electrification Project Performance

Kageni (2015) carried out a research to find out rural electrification adoption dynamics in Tharaka Nithi County. Kageni (2015) was of the view that REA has enough policies to aid in implementing its mandate. However, REA faces challenges in having an adequate funding base for its projects. Furthermore, REA has been unable to implement a project monitoring tool that works efficiently. He projected an increase in electricity consumption demand owed to the benefits accrued from electricity connections and a rise in living standards.

Njoroge, (2015) analysed influences of the Kenya power slum electrification programme on electricity uptake in Kenyan slums. The study focused its scope on the Munyaka informal settlement. The study employed an exploratory research design with a mixture of approaches. From the study, it was revealed that subsidized connection fees, electricity marketing strategy and the programme customer training utilised by Kenya Power marketing teams were positively and significantly correlated with electrification.

Steurer, Manatsgruber and Jouégo (2016) examined how private sector players can be attracted to electrification projects in Africa through risk clustering financial concept. According to them,

energy projects in Africa experience risks, more so, the adverse effects in unstable regulatory regimes and political instability leading to private sector players shying away from investing in rural electrification programmes which in turn deprives these programmes of much needed equity. In the case of debt-based projects, high interest rates deny the investors of their return on investment. To mitigate this, international financial institutions have been encouraged to cover the hazards of regulatory and political risks. With the recently developed budgetary instruments such as convertible grants by the electrification programme by the European Union member states, an equity substitute to assuming control of the business has been provided. With this extra budgetary help, electrification projects in rural areas have the likelihood being actualized and the possibility of advancement.

Wagemann and Manetsgruber (2016) likewise in their study to identify management of risk strategies for Mini-grid Deployment in Rural Areas underscored that the default of dues to implementing agencies as the central risk to mini grid projects. Political risks in general cause serious problem to many projects since the investors become risk averse during times of political crisis. To alleviate this risk, they suggested the need for local involvement in decision making and open consultative communication during the development and implementation of these projects. This approach can be successfully applied to offer a solution to the electrification projects in general.

Kariuki (2016) sought to assess rural electrification adoption by microenterprises in Muranga County Kenya. Results from this research work focused on the amount of capital invested, nature of business activity and distance from market; which significantly affected electricity uptake. These were considered one amongst the various risks associated with the adoption of rural electrification. The study concluded that electricity adoption was positive in correlation to business performance. Capital investments and proper human resource management was found to enhance business performance.

Technical Risks and Rural Electrification Project Performance

Chen, Widjaja and Chen, (2018) sought to find out the correlation between Socio-Technical risks, project risks and environmental risks Vis a Vis project performance. The study was conducted on the telecommunication industry. The study used communication as the moderating factor that links project performance and risk. The study sampled 17 New Product Development in Taiwan's telecommunications public firms. The finding indicated that that there is a constructive relationship between environmental turbulence and social- related risks, socio-technical risks and project risks, and a strong negative relationship between project performance and risk. The study identified communication as a key factor affecting risk and performance.

Karina and Moronge (2018), sought to assess the determinants of implementation of power distribution projects in Kenya. A descriptive research design was used. Almost all power

distribution projects had experienced some cost overruns. Project time management was indicated as one of the challenges associated with the failure of projects. However, the project managers were advised to accurately estimate the activities involved in a project, the resources required in those activities and the duration of time it would take to complete those activities. The entire organization should always consider documentation of risk management plans. In addition an all-round attention on all aspects for instance how to identify, analyse, respond, control and monitoring risk is crucial to mitigating the risks.

Issa (2017) did an investigation to find out how strategic change management practices influences quality services by rural electrification authority in Kenya. Implementation of strategic change practices such as ICT adoption, infrastructural development, regular training and policy formulation was found to influence quality services. The study proposed that it would be prudent for the government to build its allotment for parastatals budgets to help the representatives and the management in strategy execution and subsequently give a situation helpful for increased productivity and achievement in key changes. Customized training and development programmes ought to be offered in a periodical premise to equip workers with satisfactory abilities and provide information in their specific regions.

Torero (2015) in reviewing the effect of electrification in rural areas examined challenges involved and mitigating responses to them; reiterated that large scale rural electrification programs provide an opportunity to many development programmes in the rural sector, such as infrastructure (mobile telephony, good road access, and improved water and sanitation access). The study thus provides insights on cost minimization strategies that can be imperative in the realization of potential profits, specifically the agricultural potential of these areas. The study recommended that management team's use acquired modern technology at the lowest cost to save on finances and increase efficiency of the project.

RESEARCH METHODOLOGY

Research Design

Research designs are the mechanisms used for the collection, measurement and analysis (Schwart & Yanow, 2013). This study employed a descriptive research design. This design is suitable for analysing quantitative data and therefore, it was appropriate in this study since the study relied on quantitative data enabling different characteristics of the study to be presented.

Target Population

Sekaran and Bougie (2010) define population as the collection of segments through which conjecture is made. They apply to all areas of interest to a study. The target population is useful since it forms the basis for this study research scope. The target population in this research work

consisted of 11 electrification projects in four wards in Mukurwe-ini Sub-County. In each project, the study targeted the project heads and their team project members. Further, representatives from KPLC, REA, National government, county government and local administration was also targeted. The study encompassed views from employees working on the project. Additionally, the study collected views from the community members affected by the project. Therefore, the study targeted representatives and employees from various implementing organisations, companies, departments and agencies, making a total of 77 respondents.

Sample and Census Technique

Samples are part populations (Bryman & Bell, 2015). Further, Alvi (2016) explains a sample as a collection of units chosen from the universe to represent it. This study adopted a census technique owing to the small sample size. According to Fowler (2013), when the population is too small, sampling is not necessary and thus a census is recommended. Parker and Gallivan (2011) also acknowledges that by using the census survey, the results of a research can be generalized to the entire population. Therefore, all the 77 respondents participated in the study. Purposive technique was used in picking the respondents. The technique applies where the target respondents, particularly, their office/position is well known. In this study, the positions of all the target respondents were known that is, the project manager, assistant project manager, KPLC, REA, national government, county government and local administration representatives. The choice of the seven categories of people was justified since they were expected to be actively involved in running of the rural electrification projects and are particularly the major decision makers on matters pertaining to the projects. As such, they were the right people to give information regarding the project risks and project performance.

Data Collection Instruments

This research work used raw data collected using structured questionnaires. Questionnaires are the most commonly used methods when respondents can be reached and are willing to cooperate. Questionnaires capitulate quantitative data which can be analysed easily. The questionnaire comprised of two parts: the first part asked questions relating to the respondents demographic information while the second part asked questions relating to the study variables. The questions were in form of Likert scale, which allowed the respondents to express their opinions in regard to statements relating to the study variables.

Data Collection Procedures

The school provided an introduction letter. It was presented to the management of the rural electrification projects in Mukurwe-ini Sub County, Nyeri County. The letter was also submitted to the County Commissioner, the county government administration and to the county education

office. The structured questionnaires were administered after conducting the pilot tests. The data collection exercise was done using the drop and pick method and the interview process which were preferred method since they gave the respondents adequate duration to respond to the questionnaires.

Data Analysis and Presentation

Mayer (2015) characterizes analysis of data as a component for sorting, cleaning and organizing with the aim of creating disclosures that require understanding. The analysed data is then presented in a manner in which the reader can understand. The quantitative information gathered during examination was dissected by expressive insights and inferential measurements using Microsoft excel. Descriptive statistics comprised of the mean, standard deviation, frequencies and percentages which were facilitated by use of the Likert Scale. The study further used multivariate regression analysis to establish the relationship between the independent and dependent variables. The results from the analysis were then presented in tables, charts and graphs.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where: Y= rural electrification project Performance; $\beta_0, \beta_1, \beta_2$ and β_3, β_4 = Beta coefficients; X_1 =Financial risks; X_2 =Economic risks; X_3 =Organizational risks; X_4 =Technical risks; ϵ = Error Term

In order to test for causal relationship between the dependent and independent variables, R squared, F statistic, regression/beta coefficients were evaluated for significance using p values. The critical p value was set at 0.05 level of significance or 95% confidence interval. The results were furnished in graphs and tables.

RESEARCH RESULTS

The main objective of the study was to establish the effect of project risks on the performance of rural electrification project in Mukurwe-ini Sub-County, Nyeri County, Kenya. The study specific objectives were to establish the influence of financial risks, economic risks, organizational risks and technical risks on the performance of rural electrification projects. The study had a coefficient of correlation R of 0.715 an indication of strong correlation between the variables and coefficient of adjusted determination R² was 0.734 which changes to 73.4%.

Financial Risks and Project Performance

The study established that financial risks had a negative influence on the performance of rural electrification projects in Mukurwe-ini Sub-County. The study respondents significantly agreed that the projects experience inadequate funding which negatively affects project performance,

contribution and participation in resource provision by the community has impacted the project's performance, the projects owe a lot of money to various stakeholders including employees and suppliers and this negatively impacts project performance, vandalism of power infrastructure has affected the financial stability of the projects and this translates into slow project performance and that high set up and maintenance costs of the projects has slowed its performance. This indicates that the projects faced significant number of risks ranging inadequate funding, vandalism of power infrastructure, debts, to high operational costs. The projects however had a sound contribution and participation in resource provision by the community which has improved project performance.

Economic risks and Project Performance

The study established that economic risks negatively affected the performance of rural electrification projects in Mukurwe-ini Sub-County. It was established that political uncertainties lead to economic instability, which slows the project implementation, inflation causes high project costs which negatively affects project performance, change in government policies negatively impacts project performance, the cost of electricity connection affects project performance and high electricity tariffs slow down the project's implementation. The study established that to a great extent the projects faced economic risks ranging from political uncertainties, inflation, unfavourable government policies and cost of electricity which affected the performance of rural electrification projects in Mukurwe-in Sub-County.

Organizational Risks and Project Performance

The study established that organizational risks significantly influenced the performance of the rural electrification projects negatively. The study respondents agreed that timely decision making positively impacts on project performance, scheduling and planning of activities may lead to a change in the implementation of a project, management of the available funds negatively impacts on project performance and that the projects are faced with lack of infrastructural facilities which negatively impacts on project performance. The respondents however disagreed that the monitoring and evaluation framework negatively impacts on project performance and that coordination of activities between and within departments negatively impacts on project performance. This indicates that organizational risks negatively affected the performance of rural electrification projects in Mukurwe-ini Sub-County, Nyeri County.

Technical Risks and Project Performance

The study established that technical risks negatively influenced performance of rural electrification projects in Mukurwe-ini Sub-County, Nyeri County. The study established that to a moderate extent indicated that the project experiences high staff turnover and this negatively

impacts on project performance, the staff have insufficient skills to manage the projects and this negatively impacts on project performance, managerial competence to run the projects to completion negatively impacts on project performance, the staff are not in a position to adequately handle ICT related tasks and this negatively impacts on project performance and that the projects have inadequate staff negatively impacting on project implementation performance. This indicates that the project faced technical risks ranging from staff turnover, limited capacity, managerial competence, ICT skills and inadequate staff which negatively affected performance of the projects.

INFERENTIAL STATISTICS

The study conducted inferential statistics to establish the effect of project risks on performance of rural electrification projects in Mukurwe-ini Sub-County, Nyeri County, Kenya. The findings of coefficient of determination and coefficient of adjusted determination are as shown in Table 1.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.715 ^a	0.753	0.734	1.51134

The findings found out that coefficient of correlation R was 0.715, an indication of strong correlation between the variables. Coefficient of adjusted determination R^2 was 0.734 which changes to 73.4% an indication of changes of dependent variable can be explained by (financial risks, economic risks, organizational risks and technical risks). The residual of 26.6% can be explained by other factors beyond the scope of the current study.

The study carried out an ANOVA at 95% level of significance. The findings of $F_{\text{Calculated}}$ and F_{Critical} are as shown in Table 2.

Table 2: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	611.103	20	30.5552	6.3327	.000 ^b
Residual	241.251	50	4.8250		
Total	825.324	70			

The findings show that $F_{\text{Calculated}}$ was 6.3327 and F_{Critical} was 3.1141, this show that $F_{\text{Calculated}} > F_{\text{Critical}}$ ($6.3327 > 3.1141$) an indication that the overall regression mode was significant for the study. The p value was $0.000 < 0.05$ an indication that at least one variable significantly influenced performance of rural electrification project in Mukurwe-ini Sub-County.

The study used coefficient of regression to establish the individual influence of the variables to project performance. The findings are indicated in Table 3.

Table 3: Coefficients of Regression

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	5.251	0.315		2.331	.000
Financial risks	-0.414	.201	.110	8.033	.000
Economic risks	-0.366	.301	.022	6.215	.000
Organizational risks	-0.581	.331	.026	7.603	.000
Technical risks	-0.703	.216	.203	5.711	.000

The resultant equation was:

$$Y = 5.251 - 0.414X_1 - 0.366X_2 - 0.581X_3 - 0.703X_4$$

Where: X_1 = financial risks; X_2 = Economic risks; X_3 = organizational risks; X_4 = technical risks

The study found out that by holding all the variables constant, performance of rural electrification project in Mukurwe-ini Sub-County will be at 5.251. A unit increase in financial risks when holding all the other variables constant, performance of rural electrification project would decrease by 0.414. A unit increase in economic risks while holding other factors constant, performance of the projects would decrease by 0.366. A unit increase in organizational risk while holding other factors constant, performance of the projects would be at 0.581. A unit increase in technical risks while other factors are held constant, performance of rural electrification projects would decrease by 0.703.

The findings pointed out that financial risks, economic risks, organizational risks and technical risks had a p value of $0.000 < 0.05$ an indication that the project risks significantly influenced performance of the rural electrification projects in Mukurwe-ini Sub-County. This is supported by Kariuki (2016) in his study on rural electrification adoption by microenterprises in Murang'a County where he concluded that project risks negatively affected the adoption and performance of the rural electrification program.

CONCLUSIONS

The study concluded that project risks had a negative relationship with performance of rural electrification projects in Mukurwe-ini Sub-County, Nyeri County, Kenya.

The study concluded that the rural electrification project faced significant number of risks ranging inadequate funding, vandalism of power infrastructure, debts, to high operational costs.

It was concluded that the project faced economic risks ranging from political uncertainties, inflation, unfavourable government policies and cost of electricity which affected the performance of rural electrification projects in Mukurwe-ini-in Sub-County.

The study concluded that organizational risks negatively affected the performance of rural electrification projects in Mukurwe-ini Sub-County, Nyeri County.

The study concluded that the projects faced technical risks ranging from staff turnover, limited capacity, managerial competence, ICT skills and inadequate staff which negatively affected performance of the projects.

The study exposed bigger issues in the rural electrification project performance that expected before the study was conducted. From the research data, there is little risk management procedures implemented in the carrying out of this project as evidenced by the fact that the project was affected by a majority of the risks as stated in the questionnaire. Project performance was as expected especially in the time it takes for implementation in that delays are common with project's completion dates extending months or years thus exposing the extent to which project implementation performance is negatively influenced by risks. This study exposed the inadequate initial contact periods that do not consider all factors resulting in time delays which is attributed to project failures, poor implementation performance and abandonment of projects in Kenya. Clients (Kenyan government) should improve their project management systems where more emphasis is laid on risk aversion and project risk management which will lead to efficient management of time and cost which form part of project performance implementation parameters.

RECOMMENDATIONS

The study recommends that the projects need to ensure diligent management of debt, improve project funding and improve operational efficiency to reduce financial risks. .

The study recommends that the project team should ensure that all regulations and policies are adhered to before commencement to reduce economic risks.

The study recommends further that projects need to assess the risks they are subjected to, prepare, control and mitigate them to improve project performance.

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