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RISK MANAGEMENT STRATEGIES AND THE IMPLEMENTATION OF RURAL ELECTRIFICATION PROJECTS IN NAKURU COUNTY, KENYA

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ABSTRACT:
Rural electrification is a vital part of a nation's infrastructure in Kenya's economic plans. It is projected that approximately eighty five percent of the 1.2 billion persons without access to electricity live in the rural areas. It was recognized that there are inconsistencies on the performance of the REP in comparison to the funding being channeled to the same; three key indicates on these were used i.e. electric access rate, reliability and cost of sales all showed dismal performance hence the need to understand the effect of risk management strategies and the implementation of rural electrification project in Naivasha Constituency could not be overstated. Various researchers concurs that the correlation between uncertainty and project failure are elaborately documented, however the same cannot be said on the correlation among the various factors and the successful implementation of projects. Investigations on risk management also reported that despite the high prominence and positive insight on risk management in their establishments, an important gap exists between interest for risk management and resource allocation and staff training. The project explored on transfer risk management strategies and their effect on project implementation of rural electrification projects in Naivasha constituency, Kenya. The study employed descriptive statistic design. Purposive sampling 45 respondents were administered structured questionnaires. The finding of the study indicated that risk transfer which included outsourcing, joint ventures and use of insurance were shown to impact strongly on the impact implementation of REP projects and had not been implemented entirely into rural electrification projects in Naivasha County thus the management should be encourage on their continued applications. The study recommended on improving on risk transfer strategies in order to implement REP. By having one, Joint ventures that supports equity participation for production, technology transfer, managerial contract, and marketing and outsourcing. Two, training project team on quality assurance to improve the project plan to meet the quality standards, and aiming at preventing mistakes in REP projects. Three, introducing new approaches for the determination of risk contingencies and budgeting method.

Key words: *Risk Management, Risk Transfer, Rural Electrification*

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INTRODUCTION

The vital part of a country's infrastructure is rural electrification therefore a priority in Kenya's economic plans. It is projected that approximately eighty five percent of the 1.2 billion persons lacking contact to electrical energy live in the rural zones; this is attributed to the marginalization of the lowly, their inaccessibility and distances to electrical networks (Pauser, Fuente, & Djerma, 2015). Access to consistent and inexpensive energy can help support income-generating undertakings which depend on the usage of modern appliances and agrarian apparatus while replacing wasteful and contaminating kerosene lighting (Abdullah & Markandya, 2009). Rural electrification is extremely challenging and can be attributed to; remote and widely dispersed population. This makes the extension of the network problematic and more costly than in cities according to Cook (2011). Duke, Jacobson, & Kammen (2009) summaries that across past projects and policies; an assortment of political, social and institutional restraints are frequently mentioned as crucial factors in the propagation of contemporary energy know-how in developing countries. For a Successful rural electrification program different electrification risks must be identified, analyzed and appropriate responses developed over long periods of time. However the nature of the problem actually changes as the project evolves and matures (Barnes, 2011), thus the necessity to determine risk management strategies that affect the operation of these infrastructural projects.

Studies by Zerriffi (2008), showed that rural electrification programs and projects face undoubtedly major obstacles, the projects are however key drivers towards economic advancements and rising the elementary standards of living. According to Bhattacharyya & Dey (2007), the Indian government ambitious strategy of electrifying all communities by 2007 and complete electrification of all families by 2012 expected to guarantee a minimum of 1 kilowatt hour (KWH) of electricity intake by all families. It aimed at the development of rural dissemination framework and to craft rural electrification network by connecting one or more distribution transformer in each village according to Ayieko (2011). The scheme intended to deliver unrestricted electricity linkages to every rural homes underneath scarcity of line and to deliver continuous electricity stream to all communities.

The largest and most populous country in South America, Brazil has approximately 10 to 12 million individuals deprived of electricity (Zerriffi, 2008). This includes approximately 1.2 percent of homes in the urban centers, but the majority of the ten million resides in rural areas, predominantly in the Amazon region (Abdullah & Markandya, 2009). Bhattacharyya & Dey (2007) indicates that rural electrification is a challenge on the centralized utilities mainly on economic and technical grounds where the populations are far-flung, tough terrain, and isolated, making grid extension outlays high. Rural earnings are not normally as great as in urban centers and intake levels at these establishments incline to be inferior as compared to the urban forks. Moreover, unified utilities in numerous nations basically have the insuffient financial and managerial possessions to address all rural electricity requirements. It's noted that the grid does reach some these areas, this electricity supplied often is of poor quality and irregular in nature, making it challenging to use for both industrial and domestic purposes. This blend of high overheads and low returns short of either incentives or values led mostly to slow implementation processes thereby not meeting their collective service onuses (Ayieko, 2011).

Kenya's ability to achieve its Vision 2030 is principal; it thus established the REA to advance the electrification program. Since its operation in 2004 REA, its financing obtains from duties charged on electricity customers, access to power in the rural

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region it's depressing at 4% and access to electricity at the national level stands at 15%; while access to electricity at urban centers stands at 50% (Ayieko, 2011). The electricity industry involves a multifaceted system where political, economic, social, technical, organizational, monetary and environmental features intermingle to affect the demands of the various consumers. The government plays a key role as it is responsible for creating policy in the form of rules and guidelines that encourage accelerated or increased electricity supply among its populaces as stated by Barnes, (2010). From 2007, the country has witnessed a period of economic growth and there has been fresh motivation to expand rural grid coverage countrywide has brought about improved access to electricity, mainly in the heavily inhabited counties predominately the western region of the country. Kenyan government has elaborate plans to make electricity supply improved which includes subsidized cost as adopted from Abdullah & Markandya, (2009).

PMBoK (2013) defines nine key Project management areas as scope, time, cost, human resource, integration, quality, communication, procurement and finally project risk management. PMI (2008) defines risk as a situation that succeeds when uncertainties occurs with the probability of negatively affecting related projects goals and its performance. Berg (2010) defines risk as exposure to the probability of loss or increase of financial or economic, physical loss or damage or interruption as a result of the uncertainty associated with pursuing a sequence of actions. Project risks can be financial, legal, organizational, technical, environmental, social or political (Bhattacharyya & Dey, 2007). Risk management incorporates risk recognition, assessment, strategy development and finally mitigation of the same (Berg, 2010), this means that risk management is adopted as a development that pursues toward eradicating, decreasing and controlling risks, enhancing benefits, and avoiding disadvantages from theoretical exposures According to Sanchez et al (2009), degree of uncertainty, project difficulty and influence of these variables are the three interconnected sets of variables that affects cost and the general capacity of dealing with risk are thus concluding that risks do not impact all projects likewise and that risks can be managed. If project risk are ignored it results in debilitating effects on the performance of the project this is according to Mantel & Meredith (2009). They further state that, the failure of project to meet their budget, completion dates, quality and performance, or generate significance revenue to service the principal and interest outlays propagated the necessity for risk management. Project success can be said to be the overall attainment of project objectives and expectations; risk management aims at maximizing the likelihood of success while minimizing the likelihood of losses as stated in PMI (2008). Efficiently handling ambiguity and risk in such situations seems to be a significant component for successful project implementation. According to Berg (2010), risk management can be said to be the method of managing the probable risks by recognizing, examining and addressing them. These processes can greatly help in the reduction of negative effect and enhancing emerging opportunities.

Statement of the Problem

Energy management predicaments in other countries within the Sub-Saharan Africa (SSA) block in comparison, Kenya is not excused. There has been low access to electricity in the rural areas which is crucial obstacle to modernization, Abdullah & Markandya (2009). Therefore Kenya government established Rural Electrification Authority (REA) and significantly finances it, and other initiatives such as the Umeme Pamoja, (a programme launched in 2007 with the goal of getting clusters of rural households jointly connected to the grid). Despite enormous investments in the grid network, rates of electrification and supply remain poor even after infrastructure has been built facing a number of

challenges namely; insufficient funding, sparsely populated areas, high cost of connection and damage of power line. If not considered during project initiation these challenges pose as project uncertainty or risk. The core benefits of the REP are improvements in education, lighting, health, farming, increased employment opportunities, security enhancements and the overall improvements in the standards of living. The REP was established in 1973, it has suffered delays its implementation, the government's strategy is to have all citizens with access to electricity by 2030, popularly known as vision 2030 (Ayieko, 2011).

Kenya's estimates electricity access rates to be way below thus averages; with the overall access to stand at 15% of 2008 with urban centers at 51.3% and the rural areas at 5% (IEA, 2014). The government has an ambitious plan of having the electricity access rates at 65% by 2022 however as of 2014 the countries access rate had improved marginally to 36% (IEA, 2014). This presents a big challenge in that the government needs to attain a 29% increase in eight years to attain its target. Low access and unreliable electric supply the cost/ kWh is quite high as compared to other countries. Countries such as South Africa, India, Brazil, China, Slovenia, Canada and Poland all have very low cost/kwh of as between 0.08 and 0.22 US dollars per Kwh as compared to Kenya average cost of 0.24 USD/Kwh (KPLC, 2013) this has greatly affect the pace of economic growth and development. Transference of task is the way toward substituting any disasters and it's imperative to transfer responsibility of the risk management to the other party. Therefore the need to understand the effect of risk transfer strategies on the implementation of rural electrification project in Naivasha Constituency in Kenya could not be overstated.

Objectives of the study

The objective of this study is to determine risk transfers strategies and their effect on the implementation of rural electrification projects in Nakuru County, Kenya.

- To establish the effects of outsourcing on the implementation of the rural electrification projects.
- To establish the effect of Joint ventures on the implementation of the rural electrification projects.
- To establish the effect of Insurance policy on the implementation of the rural electrification projects.

LITERATURE REVIEW

The influence of a project may be high and its probability for occurrence may be low, this may necessitate the project manager to transfer that risk to another party. Risk transfer strategy aims to pass ownership and/or liability for a particular risk to a third party. This risk transfer strategy is mostly used in many organizations when they preserve that the risk exposure associated can be transferred to another party. It's prudent to acknowledge that the risk is best moved to another party and managed but risk cannot be eliminated (PMI, 2008). Risk transfer is predominantly used in the financial field. This is because it's possible for some arrangements to be done whereby one party pays out money, indemnify the other in the event of a risk happening (Kristensen, Aven, & Ford, 2006). In order to improve performance gaps, and not probable mend time lost risk transference virtually encompasses payment of a risk premium. Therefore it's prudent to ensure a balanced cost along with the advantage of transferring the risk. Darnall & Preston (2010) contends that risk allocation devoid of quantitative risk evaluation can result in endeavors by project manager in transferring critical obligation on risks to third parties, instead of finding the best or an optimal allocation matrix founded on mutually recognized risks (Pauser *et al*., 2015). They further states that contractors normally rewarded adequately so as to take on risk; without adequate compensation they

can't take any risk in others behalf. It's significant to quantification Risk for the purpose of the reward or equitable value to be paid out to the contractor consequently as to bear the risk due to the specified condition.

Risk transfer comprises but not limited use of insurance; whereby after payments of the agreed premium the insurer borne all financial penalties (Patton, 2014). Others key approaches under the transfer strategy performance bonds, guarantees and warranties. The use of derivatives and use of hedge funds are other optimal financial instruments that are handy for effective risk transfer this is according to Darnall & Preston (2010). Some organizations could consider self-insurance or may become prisoners as an auxiliary means of risk transfer response. The use of agreement does allow or provide the means to allocate the accountability for risk to the said contractor. Different approaches may be considered, these includes the use fixed price to efficiently allocate the monetary risk to the other party. Cost-plus contract is another approach which doesn't transfer the risk to the contractor but leaves this with the user, other contract forms to allocate the include risk-reward and target cost incentives risk contracts (Darnall & Preston, 2010). The choice of which to apply in the implementation process does depend on the type of project and the results expected from their usages (Kreitner, 2011).

According to Kreitner (2011), defined risks can be unequivocally omitted from the project, and any remaining risk can thus be endured by the client. An alternative approach would be to documentation the settled costs or consequence/incentive expenses to contractor. Myers & Newman (2007) claims that Risk transfer methods like Joint ventures and partnership engagements are fundamental to the project implementation team, it is however paramount that as much as possible all information is captured in the contract so as to avoid any ambiguity in the implementation phase of the project, clear teams of engagement should be done; terms of engagements should be precisely done. This study also sought to find out which risk transfer approach is adopted in implementation of REP. It is imperative to transfer responsibility of the risk management to the other party; ambiguity shouldn't be allowed at any cost as this impedes the implementation practice (Barnes, 2011). Risk transfer changes the project liability, and risk ownership process. The transferred party should have capacity to effectively manage the said risk, there should have excellent abilities and capabilities to manage the risk transferred to them. Failure to these the project suffers during its implementation. It must nonetheless be acknowledged that transferring these project risks does mean the risk has been removed, but merely given that responsibility to third party for its management. Potts (2008) therefore claims that if project risk is not managed well by the contractor the project will continue being exposed to the risk.

Risk transference can be exclusively suitable when both sides fully appreciate the risks paralleled to the rewards. This risk management strategy may be applied to contractors, sureties, or insurance firms. The party that shoulders the risk does so since it's knowledgeable, skilled or has other qualities that will moderate the risk. It is then impartial and thriftily proficient to transfer these risks to a third party; the party being transferred to must have both capacity and believe that they can manage the risk transferred. They should have the belief that they can best handle the risk in exchange for some value.

METHODOLOGY

Descriptive survey was adopted in this study. The study targeted population of 137. The sample size was 45 from the total population of 137 (about 30% of the study population in line with Myers & Newman (2007) who states that, for a small population (under 3000) a ratio of about 10% is needed as a

representative sample, depending on the topic under research as shown in Table 1.

Table 1: Sample Population

REP Office Nakuru County	Target Population	Sample Size
Senior Management	13	4
Middle Level Management	46	14
Project operations staff	78	27
Total	137	45

Purposive sampling was employed; specifically judgment sampling technique was used in the selection of the respondents. The researcher developed a questionnaire having structured questions. Data entry, storage and analysis was done using Statistical Packages of Social Sciences (SPSS). The research established the correlations between the various variables using Pearson's correlation to measures the strength between variables and relationships using multiple linear regression model.

$Y = \alpha + \beta_1 x + \beta_2 x + \beta_3 x + \beta_4 x + \varepsilon$

Where the variables are defined as:

Y: Implementation of REP

α: Constant

β_n**:** Coefficient of determination

x: independent variable (risk avoidance strategies, risk transfer, risk mitigation and risk acceptance)

ε - Error term.

, β_2, β_3, β_4 are coefficient of determination (risk avoidance strategies, risk transfer, risk mitigation and risk acceptance) respectively.

FINDINGS

The study applied as descriptive survey design. The sample size was forty five from the total population of one hundred and thirty seven. Questionnaires were administered and data was analyzed using Statistical Packages of Social Sciences (SPSS). The response rate was ninety three percent and fifty seven percent of age distribution were between the age thirty and forty nine. The academic Qualification of the respondent was forty eight percent who have acquired middle level college the higher diploma and diploma respondents and fifty seven percent of them were senior management. This implied that the respondents were of age and understood how to plan, direct and control implementation of rural electrification projects (REP) Nakuru County. The study sought to establish the effects of risk transfer on implementation of the REP factoring outsourcing, use of joint ventures and use of insurance policy.

Outsourcing Transfer Strategy

The study pursued to establish the effects of outsourcing on the implementation of the rural electrification projects. Table 2 shows that 11.9 % of respondent agree and 9.5% strongly agreed that outsourcing is successfully done in the organization. However, 31 % and 28.6% strongly disagreed and disagreed outsourcing is effectively done in the organization.

Table 2: Outsourcing

	Frequency	Percent	Cumulative Percent
Strongly Disagree	13	31.0	31.0
Disagree	12	28.6	59.5
Neutral	8	19.0	78.6
Agree	4	9.5	88.1
Strongly Agree	5	11.9	100.0
Total	42	100.0	

Use of joint ventures

The study aimed at establishing the effects of use of joint ventures on the implementation of the rural electrification projects. Table 3 revealed that 9.5 % respondent agreed and 7.1% strongly agreed that that organization encourages the use of joint ventures in its processes in the organization. However, 26.2 % and 28.6% strongly disagreed and disagreed that organization encourages the use of joint ventures in its processes in the organization while only 28.6% of the respondent were not sure.

Table 3: The use of joint ventures

	Frequency	Percent	Cumulative Percent
Strongly Disagree	11	26.2	26.2
Disagree	12	28.6	54.8
Neutral	12	28.6	83.3
Agree	3	7.1	90.5
Strongly Agree	4	9.5	100.0
Total	42	100.0	

Use of insurance policy

The study pursued to establish the effects of use of insurance policy on the implementation of the rural electrification projects. The findings from table 4 revealed that 23.8 % agreed that organization encourages the use of insurance policy can led to successful implementation of REP in the organization. However, 14.3 % and 28.6% strongly disagreed and disagreed that organization encourages the use of insurance policy can led to successful implementation of REP in the organization while only 33.3% of the respondent were not sure.

Table 4: Use of insurance policy

	Frequency	Percent	Cumulative Percent
Strongly Disagree	6	14.3	14.3
Disagree	12	28.6	42.9
Neutral	14	33.3	76.2
Strongly Agree	10	23.8	100.0
Total	42	100.0	

Model Summary for risk transfer

Table 5 provided the Pearson's R and R^2 values. The R value of 0.863 was arrived at from the simple correlation exercise. This value shows that the degree of correlation is significantly high. The R^2 value shows the level of dependency; to what extent can the dependent variables success in Implementation on the project be attributed to the independent variable, risk transfer. In this study, R^2 is at 0.744. The project is explained by 74.4% of the variation in Success in Implementation of in risk transfer.

Table 5: Model Summary for Risk Transfer

R	R Square	Adjusted R Square	Std. Error of the Estimate
.863a	.744	.742	.427

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ANOVA Table

Table 6: ANOVA Table for risk transfer

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	58.709	1	58.709	322.713	.000b
Residual	20.194	111	.182		
Total	78.903	112			

a. Dependent Variable: Success in Implementation of Project

b. Predictors: (Constant), risk transfer

Risk transfer Coefficients

The table 7 gives the Coefficients for risk transfer; these provide relevant data on the various predictor variables. The information provided very crucial in prediction of the success in Implementation of Project from risk transfer perspective. The constant and Success in Implementation of Project considerably contributes to the model.

Table 7: Risk transfer and success implementation of REP projects

	Unstandardized Coefficients	Standardized Coefficients		t	Sig.
	B	Std. Error	Beta		
(Constant)	.190	.204		.929	.355
Risk Transfer	.892	.050	.863	17.964	.000

a. Dependent Variable: Success in Implementation of Project

The following calculation is a representation of the regression equation as: Success in Implementation of Project = 0.892 + 0.190 (risk transfer)

ANOVA Table 6 and Coefficients Table 7 illustrate p-value is 0. This implies that there is a significant relationship between success in Implementation of Project and risk transfer. Table 7 gives the correlation coefficient(R) at 0.863. We thus concluded that Success in Implementation of Project is positively correlated with risk transfer and the relationship can be said to be very strong.

Project Implementation

The study pursued to determine the implementation of the project in terms of how well the project objectives (Time, quality & Budget) were met. The findings from table 8 revealed that 33.3% and 31.0% strongly agreed and agreed that using risk transfer strategies led to successful implementation of REP projects in the organization. However, only 21.4% disagreed that using risk transfer mgt. strategies led to successful implementation of REP projects in the organization while only 11.9% of the respondent were neutral.

Table 8: Risk transfer and success implementation of REP projects

	Frequency	Percent	Cumulative Percent
Strongly Disagree	1	2.4	2.4
Disagree	9	21.4	23.8
Neutral	5	11.9	35.7
Agree	13	31.0	66.7
Strongly Agree	14	33.3	100.0
Total	42	100.0	

SUMMARY

The study applied as descriptive survey design. The sample size was 45 from the total population of 137. Questionnaires were administered and data was analyzed using Statistical Packages of Social Sciences (SPSS). The response rate was 93% percent and 57% of age distribution are between the age 30 and 49. The academic Qualification of the respondent was 48% who have acquired middle level college the higher diploma and diploma respondents and 57% of them were senior management. This implies that the respondent were of age and understanding to plan, direct and control implementation of rural electrification projects (REP) Naivasha County. The study aimed at determining how risk transfer effects the implementation of the rural electrification projects. Risk transfer involves passing the risk to a third party. In this study risk transfer include outsourcing, joint ventures, insurance. The finding shows that outsourcing done in the organization revealed 31 % and 28.6% strongly disagreed and disagreed outsourcing is effectively done in the organization. The findings revealed that 26.2 % and 28.6% strongly disagreed and disagreed that organization encourages the use of joint ventures in its processes in the organization while only 28.6% of the respondent were not sure. However 23.8 % agreed that the use of insurance policy can led to successful implementation of REP but 28.6% disagreed while only 33.3% of the respondent were not sure. The unstandardized coefficient beta weight of 0.892, which helps to show the unique contribution of the variable as a predictor of the dependent variable, thus the study concludes that success in implementation of project is positively correlated with risk transfer and the relationship is very strong as depicted by the R square of 0.744, which showed the impact thereof.

CONCLUSION AND RECOMMENDATION

The study indicates that risk transfer which includes outsourcing, joint ventures and use of insurance were shown to impact strongly on the impact implementation of REP projects. The Study concludes that risk transfer has not been implemented entirely into rural electrification projects in Naivasha County thus the management should be encourage on their continued applications. These service agreements and contracts should be perused further to ensure optimization of the outputs. There should be a continuous improvement process. Outsourcing and having a joint venture in this case cannot lead to successful implementation of REP according to this study. Khamaksorn (2016) recognizes project' effectiveness in learning and transferring knowledge is factored by trust, commitment, effective communication and distance culture. Thus the study recommends on improving on risk transfer strategies in order to implement REP. By having one, Joint ventures that will support equity participation for production, technology transfer, managerial contract and marketing and outsourcing will aid in transferring variety of project risks to a partner on contract terms. Two, training project team on quality assurance to improve the project plan to meet the quality standards, and aiming at preventing mistakes in REP projects. Three, introducing new approaches for the determination of risk contingencies and budgeting method.

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