Effect of Project Risks on Performance of Kenya Power's Last Mile Connectivity Project in Murang'a County, Kenya

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Abstract:

Background: Government projects in different countries often underperform in terms of cost, time and quality of their deliverables. In the case of Kenya Power's Last Mile Connectivity project, the situation is not different. While the aim of the project was to increase accessibility to electricity among rural Kenyans by 2020, quite a high population in the rural areas still are still not connected to the national grid. The fundamental question therefore, which calls for research, is what project risks have been affecting the performance of the Last Mile Connectivity project in the different parts of the country? However, empirical studies that have been conducted on project management practises and project implementation lacks sufficient insights pertaining to the project risks involved in the LMC project and their effect on the project performance particularly in Murang'a County. Thus, there is inadequate empirical insight to inform any intervention to enhance the performance of the project. To address these empirical inadequacies, this research assessed project risks and performance of Last Mile Connectivity project in Murang'a County.

Methodology: The study used descriptive research design. Positivism research philosophy was applied. The target population for the study involved all the 62 key personnel responsible for implementation of Last Mile Connectivity Project in Kiharu Constituency, Murang'a County from whom data was collected using semi-structured questionnaire. The data was analyzed through descriptive and inferential statistics analysis.

Results: Majority of the respondents agreed that political risks, environmental risks, socio-cultural risks and inflationary risks existed in the implementation of the LMC project in Kiharu constituency. Political risks and socio-cultural risks were found to have a significant negative effect on project performance while environmental risks and inflationary risks had insignificant effect on the project performance.

Keywords: Project Performance; Socio-Cultural Risks; Environmental Risks; Inflationary Risks; Political Risks.

I. Introduction

The purpose of any government is to ensure that it caters for the welfare of its citizens. This involves implementation of development projects that enhances economic growth as well as ensuring that that the quality of life for each citizen has been improved. However, as Pourrostam and Ismail (2011) highlighted, governments worldwide especially in less developed countries often lose colossal amounts of money through failed development projects. Kenya is no exempt as Kimiti and Moronge (2018) indicated that most government projects being implemented countrywide have failed in terms of their performance. This means they do not meet their target goals and objectives or they do not meet the public expectations in terms of their results. This calls for a need to interrogate the various risks that affect project performance in the different contexts they are implemented, in order to devise the appropriate interventions to mitigate them.

The Kenyan government have implemented various development projects in line with global development visions such as the Millennium Development Goals (MDGs), and national development goals and objectives such as the Vision 2030. One of the interventions that the government sought to implement in order to stimulate the much needed economic growth was to expand electrical power distribution system, so that most of the citizens could easily afford to be connected to the national grid, thus trigger more economic activities at the microeconomic level (Kenya Power, 2014). It is on this background that the Last Mile Connectivity (LMC) project was initiated with its implementation been set to be done in the entire country.

However, like other projects in the country, LMC project was not immune to various project risks that affect implementation of government projects. While the aim of the project was to increase accessibility to electricity among rural Kenyans by 2020, quite a high population in the rural areas still are still not connected to the national grid (Kahoreria, Bett & Wanjala, 2019). The fundamental question therefore was what are these project risks and how have they affect the performance of this critical project? This research therefore assessed the project risks involved in Last Mile Connectivity project and their influence on and performance of the

project. The specific objectives of the study were to establish the effect of: political risks, environmental risks, socio-cultural risks and inflationary risks on performance of the last mile connectivity project.

II. Methodology

Various approaches and techniques were employed to undertake the research which covered diverse categories of workers in the Last Mile Connectivity Project.

Study Design:

This study used descriptive design was considered for this research due to its strength of describing the present status of the phenomenon under investigation with high accuracy (Rahi, 2017).

Study Location:

The research was done in Kiharu Constituency which is in Murang'a County, Kenya. The area is estimated to be 268.8Km^2 with an estimated population of 181,076 households.

Study Duration:

The study took one year from August 2019 to September 2020.

Population:

The population for the study comprised of 62 project workers in the Last Mile Connectivity Project. These included the regional manager, the contractors (project engineers), project managers and sub-contracted employees.

Sample size calculation:

The target population was relatively small and therefore, the research determined to cover the entire 62 project workers in charge of the project in the target constituency.

Subjects & selection method:

The inclusion criteria was those directly involved in the implementation of LMC project in Kiharu Constituency and those in the project management team for the project. In this regard, the participants included the regional manager, the contractors (project engineers), project managers and sub-contracted employees.

Procedure methodology

After getting a written approval from Kenyatta University to carry out the study and obtaining permission from the Kenya National Commission for Science, Technology and Innovation, the researcher embarked on data collection. The regional manager was first notified of the intent to undertake the study and after allowing the study to proceed as planned, data collection from respondents kick-started using a semi-structured questionnaire. Respondents were first briefed about the research and its motive and they were given the freedom to accept or decline to be engaged in the study. After consenting to be engaged in the study, the questionnaire was administered through drop and pick later method. Follow ups were then done to pick the filled questionnaires on the agreed dates and at the agreed time.

Statistical analysis

Descriptive statistics analysis of the study variables was undertaken which entailed computation of frequencies, percentages, means and standard deviation. The study also applied a multiple linear regression model in determining the effect of independent variables on the dependent variable The regression analysis were done at 95% confidence level. Therefore, the cut off level for significance was $\rho < 0.05$.

III. Results

To assess the different project aspects under investigation, a set of statements was used pertaining to each of the aspects including project performance, political risks, environmental risks, socio-cultural risks and inflationary risks. Respondents rated their agreement or disagreement with the statements on a scale of 1 to 5 where: 1=strongly agree, 2=disagree, 3=neutral, 4=agree and 5=strongly agree. The mean was computed for the rating on each aspect as well as the standard deviation (Std Dev).

Project Performance

Table 1: Perception on LMC project performance

Statement	1	2	3	4	5	Mean	Std Dev
The cost that has been incurred on the project so far has not exceeded the budget costs	38.0	32.0	12.0	16.0	2.0	2.12	1.154
The total cost of the project at its completion is likely to be similar or less than budgeted costs.	32.0	36.0	16.0	16.0	-	2.16	1.057
The project is being implemented fast enough and is likely to be completed before December 2020	30.0	34.0	16.0	14.0	6.0	2.32	1.220

	1	2	3	4	5	Mean	Std Dev
The number of people in the area likely to be connected to the national grid by December 2020 is likely to reach the project target	26.0	34.0	14.0	2.0	24.0	2.64	1.509
The customers who have benefited with access to electrical power are getting high quality services from the project	-	2.0	-	32.0	66.0	4.62	0.602
Overall						2.77	1.108

Table 1 shows that respondents disagreed that the cost incurred on the project so far had not exceeded the budget costs (mean= 2.12; Std Dev= 1.154). They equally disagreed that the project implementation was quite fast and likely to be completed before December 2020 (mean= 2.32; Std Dev= 1.220). Even so, the respondents agreed that customers who have benefited with access to electrical power through the LMC project are getting high quality services from the project (mean= 4.62; Std Dev= 0.602). The overall mean for project performance was 2.77 with a Std Dev of 1.108 which is an indication of poor LMC project performance in Kiharu Constituency.

Political Risks

Table 2: Perception on political risks

Statement	1	2	3	4	5	Mean	Std Dev
Politicians in Kiharu constituency have a tendency of interfering with government projects in the area	8.0	14.0	4.0	14.0	60.0	4.04	1.399
There is a lot of politics in the procurement process of the materials for the Last Mile Connectivity project	20.0	10.0	10.0	10.0	50.0	3.60	1.641
Political leaders influences the contract awarding process for the employees in the project	18.0	12.0	8.0	10.0	52.0	3.66	1.624
Politicians in the area have been influencing the local people's perception towards the Last Mile Connectivity project	6.0	12.0	4.0	8.0	70.0	4.24	1.318
Some of the laws made by the county administration largely covers the Last Mile Connectivity project activities	16.0	18.0	20.0	10.0	36.0	3.32	1.518
Overall						3.77	1.500

As evident in Table 2, respondents agreed that the politicians influence the local people's perception towards the LMC project (mean= 4.24; Std Dev= 1.318), noting that the politicians in the constituency have a tendency of interfering with government projects in the area (mean= 4.04; Std Dev= 1.399). They specifically pointed out that there is a lot of politics in the procurement process of the materials for the LMC project (mean= 3.60; Std Dev= 1.641) whereby, political leaders allegedly influences the contract awarding process in the project (mean= 3.66; Std Dev= 1.624). The overall political risks in the LMC project were rated at a mean of 3.77 with a Std Dev of 1.500 which indicates their agreement that political risks existed in LMC project.

Environmental Risks

Table 3: Perception on environmental risks

Statement	1	2	3	4	5	Mean	Std Dev
Weather conditions in Kiharu Constituency is largely characterized by seasons of consistent high rainfall during the year	2.0	-	4.0	16.0	78.0	4.68	0.741
The topography of Kiharu constituency is hilly with several noticeable valleys	-	2.0	2.0	14.0	82.0	4.76	0.591
There are frequent weather changes across the year which is often a concern	-	8.0	-	24.0	68.0	4.52	0.863
Kiharu Constituency often experience major natural disasters like mud slides and floods	-	28.0	12.0	18.0	42.0	3.74	1.275
Lightning and thunderstorms are a frequent occurrence in Kiharu Constituency	12.0	22.0	18.0	12.0	36.0	3.38	1.469
Overall						4.22	0.988

Pertaining to environmental risks as shown in Table 3,, the respondents agreed that, the topography of the constituency is hilly with several noticeable valleys (mean= 4.76; Std Dev= 0.591); weather conditions in the constituency are characterized by seasons of consistent high rainfall during the year (mean= 4.68; Std Dev= 0.741); and that there are frequent weather changes across the year which is often a concern (mean= 4.52; Std Dev= 0.863). The overall environmental risks were rated at a mean of 4.22 with a standard deviation of 0.988 which indicates the respondents' agreement that environmental risks existed in the LMC project.

Socio – Cultural Risks

Table 4: Perception on socio-cultural risks

Statement	1	2	3	4	5	Mean	Std Dev
There is a language barrier between the indigenous people and the workers involved in the project	14.0	12.0	2.0	16.0	56.0	3.88	1.534
The cultural practices of the indigenous people in the area poses a threat to non-locals in the area	20.0	32.0	12.0	-	36.0	3.00	1.616
The beliefs of the local community are against major project activities in the land	20.0	48.0	10.0	6.0	16.0	2.50	1.329
Uncivilization is high in Kiharu Constituency	14.0	38.0	26.0	10.0	12.0	2.68	1.203
It is difficult for workers from outside the constituency to integrate into the culture of the local community	10.0	24.0	8.0	14.0	44.0	3.58	1.500
Overall						3.13	1.44

The respondents agreed that there was a language barrier between the indigenous people and the workers involved in the project (mean= 3.88; Std Dev.= 1.534). They also agreed that it was difficult for workers from outside the constituency to integrate into the culture of the local community (mean= 3.58; Std Dev= 1.500). They were however neutral on the allegation that the cultural practices of the indigenous people in the area posed a threat to non-locals in the area (mean= 3.00; Std Dev= 1.616). Overall, social – cultural risks were rated at a mean of 3.13 with a Std Dev of 1.44 indicating that most of the respondents were neutral on the existence of socio-cultural risks in the LMC project.

Inflationary Risks

Table 5: Perception on inflationary risks

Statement	1	2	3	4	5	Mean	Std Dev
The price of the materials used in the project has been rapidly increasing.	10.0	18.0	14.0	10.0	48.0	3.68	1.477
Inflation has caused the cost of labour in the area to increase greatly	2.0	16.0	12.0	18.0	52.0	4.02	1.22
The price of the project materials has been high in most times due to inflation	6.0	14.0	10.0	14.0	56.0	4.00	1.340
Changes in inflation in the national economy have been causing major price changes for many consumer goods in the constituency.	2.0	8.0	12.0	24.0	54.0	4.20	1.069
Inflation is a major issue in most times of the year	4.0	14.0	16.0	16.0	50.0	3.94	1.268
Overall						3.97	1.275

Respondents agreed that changes in inflation in the national economy had been causing major price changes for many consumer goods in the constituency (mean= 4.20; Std Dev= 1.069). They also agreed that inflation had caused the cost of labour in the area to increase greatly (mean= 4.02; Std Dev= 1.220). Moreover, they agreed that the price of the project materials had been high in most times due to inflation (mean= 4.00; Std Dev= 1.340). The overall inflationary risks rated at a mean of 3.97 with a standard deviation of 1.275 indicating that majority of the respondents agreed that there were inflationary risks in the LMC project.

Correlation Analysis

Pearson correlation coefficient was computed to determine the strength of relationship between the dependent variable (Project performance of the LMC project) and each of the independent variables (project risks including political risks, environmental risks, socio-cultural risks, and inflationary risks). The Pearson correlation coefficient (r) shows the nature of relationship that exists between the variables. That is, whether they are negatively or positively related. According to Gogtay and Thatte (2017), the relationship is estimated on a scale of −1 to +1 whereby it is a strong negative correlation if $−1 \leq r \leq −0.5$; a weak negative correlation if $−0.5 < r < 0$; no correlation if $r = 0$; a weak positive correlation if $0 < r < 0.5$; and strong positive correlation if $0.5 < r \leq 1$.

Table 6: Correlation coefficients between project performance and project risks

		Project performance	Political Risks	Environmental Risks	Socio-cultural Risks	Inflationary Risks
Project performance	Pearson Correlation	1	-.611**	-.378**	-.559**	-.435**
	Sig. (2-tailed)		.000	.007	.000	.002
	N	50	50	50	50	50
Political Risks	Pearson Correlation	-.611**	1	.283*	.606**	.618**
	Sig. (2-tailed)	.000		.046	.000	.000
	N	50	50	50	50	50
Environmental Risks	Pearson Correlation	-.378**	.283*	1	.352*	.436**
	Sig. (2-tailed)	.007	.046		.012	.002
	N	50	50	50	50	50
Socio-cultural Risks	Pearson Correlation	-.559**	.606**	.352*	1	.711**
	Sig. (2-tailed)	.000	.000	.012		.000
	N	50	50	50	50	50
Inflationary Risks	Pearson Correlation	-.435**	.618**	.436**	.711**	1
	Sig. (2-tailed)	.002	.000	.002	.000	
	N	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

As Table 6 indicates, there was a significant strong negative correlation between project performance and political risks (r= −0.611, p= .000). Similarly, there was a strong negative correlation between project performance and socio-cultural risks (r= −0.559, p= .000). However, there was a significant weak negative correlation between project performance and inflationary risks (r= −0.435, p= .002), and between project performance and environmental risks (r= −0.378, p= .007).

Regression Analysis

Table 7: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.684a	.468	.421	.98430	.468	9.909	4	45	.000

a. Predictors: (Constant), Inflationary Risks, Environmental Risks, Political Risks, Socio-cultural Risks

The value of R Square as indicated in Table 7 was 0.468. This means that the project risks assessed in this study (including political risks, environmental risks, socio-cultural risks, and inflationary risks) influences 46.8% of changes in performance of LMC project in Kiharu constituency. The rest of the changes in performance of the project are determined by other factors apart from the four project risks investigated.

Table 8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38.402	4	9.600	9.909	.000b
	Residual	43.598	45	.969		
	Total	82.000	49			

a. Dependent Variable: Project performance
b. Predictors: (Constant), Inflationary Risks, Environmental Risks, Political Risks, Socio-cultural Risks

From the ANOVA results presented in Table 8, the p-value was 0.000. Since this is less than 0.05, it means that the F-statistic is significant. Therefore, the implication is that the estimated regression model for the influence of the independent variables (inflationary risks, socio-cultural risks, environmental risks, political risks) on project performance in LMC is statistically significant at the 0.05 level of significance.

Table 9: Regression coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	5.413	.706		7.662	.000	3.990	6.835
	Political Risks	-.404	.128	-.460	-3.169	.003	-.661	-.147
	Environmental Risks	-.282	.165	-.207	-1.713	.094	-.614	.050
	Socio-cultural Risks	-.300	.148	-.330	-2.032	.048	-.597	-.003
	Inflationary Risks	.179	.176	.173	1.018	.314	-.175	.532

a. Dependent Variable: Project performance

A linear regression model was formulated based on the regression coefficients in the form:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$$

Where Y = performance of LMC project; X_1 = political risks; X_2= environmental risks; X_3= social-cultural risks; and X_4= inflationary risks. b_0 is the regression constant, while b_1, b_2, b_3 and b_4 are regression coefficients for the influence of X_1, X_2, X_3, and X_4 respectively. In this regard, the regression model for the influence of the project risks on performance of LMC project was:

$$Y = 5.413 – 0.404 X_1 – 0.282 X_2 – 0.300 X_3 + 0.179 X_4$$

As presented in Table 9, the regression coefficient for political risks (b_1= − 0.404) was significant since p-value (Sig. = 0.003) is less than 0.05. A similar trend was noted for social-cultural risks which was significant as reflected in their coefficient of (b_3= − 0.300, p= 0.048 which is less than 0.05). However, for environmental risks, the coefficients were (b_2= − 0.282, p= 0.094) which means that it is not significant since the p-value is greater than 0.05. Moreover, the coefficients for inflationary risks (b_4= 0.179, p= 0.314) is not significant since the p-value is greater than 0.05.

IV. Discussion

Political risks in the implementation of the LMC project in Kiharu constituency rated at a mean of 3.77. This confirms assertion by Carvalho and Rabechini (2014) who indicated that high political risks exist in most projects management. Politicians in the area have been influencing the local people's perception towards the project and they often interfere with government projects. There is also a lot of politics in the procurement process of the materials for the LMC project. Regression results show that political risks had a significant negative effect on LMC project performance whereby, an increase of the risks by one unit reduces the performance of the project by 0.404 units. The findings concur with Ogot (2014) whose findings also revealed that political risks adversely affected project performance.

The aggregate mean for environmental risks in the LMC project in Kiharu constituency was 4.22. This is congruent to Liu and Deng (2015) who found that high environmental risks existed in projects. The risks are largely constituted by topography of the constituency which is hilly with several noticeable valleys, frequent weather changes across the year which is often a concern, and seasons of consistent high rainfall during the year. However, regression analysis results indicated that environmental risks had insignificant negative effect on project performance. The findings disagree with Wallace, Keil and Rai (2004) who indicated that environmental risks directly and significantly impact project performance.

Social–cultural risks in the LMC project in Kiharu constituency on average rated at a mean of 3.13. The only major socio-cultural risk confirmed by respondents was the existence of a language barrier between the indigenous people and the workers involved in the project. They were however neutral on the statement that the cultural practices of the indigenous people in the area posed a threat to non-locals in the area. This disagrees with the findings by Muchogu (2016) who indicated that cultural practices scared away non-local contractors, which led to delayed implementation of projects in Zimbabwe. Regression analysis results revealed that socio-cultural risks had a significant negative effect on LMC project performance whereby, a unit increase in social-cultural risks was found to reduce the project performance by 0.300 units. The findings concur with Hasani, Tularam and Regan (2017) who found that socio-cultural risks had a significant negative impact on project performance.

Inflationary risks in the LMC project in Kiharu constituency were aggregated at a mean of 3.97. Inflationary risks in the LMC project are attributed to inflation which is a major issue in most times of the year. As a result price of the project materials are usually high in most times due to the inflation and the cost of labour in the area to increase greatly. The findings concur with Assefa et al. (2014) who indicated that country inflationary policies led to increase in project costs. Even so, regression results indicated that inflationary risks had insignificant effect on project performance. The findings however disagree with Bromilow (2014) who indicated that inflation risks had a significant negative impact on performance.

V. Conclusion

The study concludes that there are political risks involved in the LMC project in Kiharu constituency, which causes a significant negative effect on the project performance. It is also concluded that although environmental risks exists in the LMC project in Kiharu constituency, they have an insignificant negative effect on the project performance. On socio-cultural risks, the study concluded that existent socio-cultural risks in the LMC project in Kiharu constituency have a significant negative effect on the project performance. However, on inflationary risks involved, the study concluded that although they exist in the LMC project, they do not have a significant effect on the project performance. In a nutshell therefore, the study concluded that political, environmental, socio-cultural, and inflationary risks are evident in LMC project in Kiharu constituency but only political and socio-cultural risks have a significant negative effect on the project performance while environmental and inflationary risks have insignificant effect on the project performance.

References

[1].   Assefa, Y., Rivera, O. P. & Vencatachellum, D. (2013). Macro and micro determinants of project performance. *African Evaluation Journal*, 2(1), 1-9

[2].   Bromilow, F. (2014). The impact of inflation and industrial strife on the construction industry in Australia. *Engineering Costs and Production Economics Journal*, 5 (3-4), 179-192.

[3].   Carvalho, M., M. & Rabechini, R. (2014). Impact of risk management on project performance: The importance of soft skills. *International Journal of Production Research*, 53 (2), 321-340.

[4].   Gogtay, N. J. & Thatte, U. M. (2017). Principles of correlation analysis. *Journal of the Association of Physicians of India*, 65, 78-81.

[5].   Hasani, M., Tularam, G. & Regan, M. (2017).Impacts of Cultural Risk Factors on Project Success in the UAE Construction Industry. *International Congress on Modelling and Simulation,* Hobart: Australia.

[6].   Kahoreria, W. R. Bett, S. & Wanjala, K. (2019). Power connectivity and performance of Kenya Power and Lighting Company in Western Kenya. *The International Journal of Science & Technoledge*, 7(10), 61-67.

[7].   Kenya Power, (2014). *The Last Mile Connectivity Project: Project Phase 1-Location of Transformers per County*. Retrieved from:<http://kplc.co.ke/img/full/Ttw4b0FDZWjQ_LAST%20MILE%20LAUNCH%20-%20EMAIL%20.pdf> (Accessed on 14th March 2019).

[8].   Kimiti, F. M. & Moronge, M. (2018). Influence of project management practices on implementation of county governments projects in Kenya: A case of Nakuru County. *The Strategic Journal of Business & Change Management*, 5(2), 58-82.

[9].   Liu, S. & Deng, Z. (2015). How environment risks moderate the effect of control on performance in information technology projects: perspectives of project managers and user liaisons. *International Journal of Information Management*, 35(1), 80-97.

[10].   Ogot, Y. O. (2014). *An investigation of political, economic and environmental risk factors that affect successful implementation of public private partnership projects in the Kenyan road sub-sector* (Unpublished MBA Thesis). United States International University, Nairobi.

[11].   Pourrostam, T. & Ismail, A. (2011). Significant factors causing and effects of delay in Iranian construction projects. *Australian Journal of Basic and Applied Sciences*, 5(7), 45-450.

[12].   Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, 6(2), 1-5.

[13].   Wallace, L., Keil, M. & Rai, A. (2004). How software project risk affects project performance: An investigation of the dimensions of risk and an exploratory model. *A Journal of the Decision Sciences Institute*, 35 (2), 289-321.