ROLE OF SUPPLY CHAIN RISK MANAGEMENT ON PROCUREMENT PERFORMANCE IN COUNTY GOVERNMENTS IN KENYA

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Abstract: **County Governments in Kenya have undertaken projects that have failed to meet the intended objectives largely due to increased risk and uncertainty in supply chain. The general objective of this research project is to establish the role of supply chain risk management on procurement performance; case study of Kericho County Government. The objectives of the study were: to determine how supply chain risk identification, supply chain risk assessment, supply chain risk mitigation and supply chain risk monitoring influences procurement performance. Descriptive research design was adopted where target population of 400 respondents drawn from both technical and support departments. Sample size of 120 respondents was utilized using stratified random sampling design. Questionnaires were used as the research instrument. Quantitative data was presented in tables and multiple regression analysis was used in development of the research model. The outcome of the research points out that the independent variable has good explanatory power and significant. The study recommends that: County Governments should develop mechanisms for identification of risks; develop and implement appropriate mechanisms for analysis and evaluation of risks; undertake risk mitigation planning to mitigate against risks and; ensure appropriate risk control and monitoring management strategies are developed and implemented.**

Keywords: **supply chain risk identification, supply chain risk assessment, supply chain risk mitigation and supply chain risk monitoring.**

1. INTRODUCTION

Risk management is a complex phenomenon and changes tune with time, as such organizations are encourages to embrace strategic risks mitigation approaches to enhance organizational performance (Chapman & Ward, 2007). In supply chain context, if risks mitigation strategies are not robust, implementation of programmes, services and process flows are adversely affected (Tang & Nurmaya,2010). Outsourcing is a risk mitigation strategy and dominant model in supply risks transfer (Chapman & Ward, 2007). Diabat et.al. (2011) argues that inter-linkages between risk assessment and risk mitigation strategies are captured into the categories of core operation of the organization, macro level risks, supply and demand related risks and risks associated with information communication technology. Kerzner, (2009), argues that procurement risk management follows four phases: identifying items that can create potential losses, evaluating the probable risks, developing appropriate risk mitigation strategies and execution of risk prevention plans. As such, therefore, having systematic risk management for early detection of risks reduces development of exigence plans to cover for any eventuality.

Statement of the problem

As the operations of procurement practices expands, coordination among the key sections becomes complex. The ability to manage risks throughout the entire procurement spectrum becomes a central action point to mitigate against consequences

(Maytorena et al. 2017). Kericho County Government, since the advent of devolution, has realized a significant implementation of projects in all departments. However, many projects have failed to meet the intended objectives as envisaged largely due to increased risk and uncertainty in its execution. Despite previous studies on role of risks management on national government projects performance, none has focused on the role of supply chain risk in the County Government perspective in Kenya with bias of the Kericho County Government. A number of procurement projects estimated at about 68 percent that have been undertaken since the advent of devolution, have experienced some execution challenges despite adoption of procurement risk management strategies as indicated in the KPMG report of 2017. African Development Bank Report of 2017 puts that almost 52% of such development projects did not meet the intended objectives and some leading to lack of value for money in County Government projects. With such information in mind, there has been shortage of empirical evidence and studies on the subject of the research. This study seeks to fill the gap by establishing the role of supply chain risk management in county Government context in the performance of procurement in Kenya.

Objectives

  i.   To determine how supply chain risk identification influences procurement performance in County Government in Kenya.

 ii.   To find out how supply chain risk assessment influences procurement performance in County Government in Kenya.

iii.   To establish how supply chain risk mitigation influences the procurement performance in County Government in Kenya.

 iv.   To determine how supply chain risk monitoring influences procurement performance in County Government in Kenya.

2.   THEORETICAL REVIEW

Prospect theory

Prospect theory emphasizes that chances for loss have more emotive bearing than equivalent amount of profits. As such decision makers will focus more on the loss made by an institution other than the gains (Eskesen et. al, 2004). Decision makers factors a lot of effort on the value of each decision consequence by its decision weight. Decision pertaining risks are often arrived by insights of the occurrence of a certain decision point. Decision makers at times, out of their discretion, provide decision weights of low probabilities more than high and medium probabilities (Smith, 2006). For decision makers to make informed decisions, accurate and reliance of data ought to be available to guide in understanding a certain phenomenon under discussion. This will be used as a precedence in assessing risk events.

In reviewing procurement risks, one should be able to plan for a team of professionals to champion risk management processes; identify events for detecting the risks; assessing the identified risks; develop appropriate strategies for risk-response; detecting and identify how the risks have changed (Tversky & Kahneman, 1979). For a sound risk management strategy, organizations should develop robust risk identification and responses approaches; this is partly due to the fact that if procurement risk is not adequately addressed, it may affect procurement projects adversely in terms of planned expenses, project schedule and quality of works. It is also notable that increased project duration and poor quality of delivered projects leads to increased costs in procurement projects.

Network Theory

Network theory provides a model that apply to procurement risk assessment and broadly review some limitations that may result to coverage of events with some uncertainties. Identification of current and future risks is key in determining the status of risk emanating from the supply chain process. Many approaches consider the current status, while the future status which also has an impact on assessing the procurement risk management system is not taken into consideration (Meampol & Ogunlana, 2006). Routine supply chain processes are mostly based on compliance and timelines and less focus on assessment of risks, as such network theory call for incorporation of risk assessment when making such decisions. This theory further calls for a collaborative approach in managing risks in procurement involving all key players in decision making process and looking into the futuristic risks instead of focusing on what can happen at the moment. This theory, calls for the involvement of the procurement managers and other team of professionals to undertake and implement the risk management tasks.

Dynamic Risk Management Theory

The model can be described as follows; at time zero, the levered firm decides whether to start a contract and how to implement. In the course of operation, an entity can go under forcing its debtors to recover the loss and the shareholders reap nothing calling for write off and terminate or repudiate contracts. The entity may choose to meet its debt burden and pay all the expenses incurred and then makes a decision based on the amount of risks involved. The entity may choose to adopt risk management, and consider decisions such as to terminate the contract early enough, bearing in mind that, initiation and the termination of the contracts bears transactions risks in terms of cost (Klapper, et.al., 2001).

Dynamic risk management model is continuous framework and seeks to guide decision makers on ways to address difficult decisions such as right timing to initiate risk management contracts and frequency of variation of contracts. This theory helps procuring entities in making key decisions at the inception of the projects, taking into consideration the cost benefits analysis. The decisions on whether to continue with the projects or terminate it rests with the risk's mitigation strategy employed (Klapper, et.al., 2001).

Stakeholder Theory

The proponent of the Stakeholder theory was Freeman in 1984.The theory relies majorly on institutional policy and legal mandate, its effects and stakeholder interests. Sound corporate risk management practices may lead to effective utilization of resources and better governance (Leo & Huberts ,2000). This theory plays a vital role in making better insights into governance issues and making rational decisions for better and prudent risk management. It is against this backdrop that the need for undertaking risk management approaches in the procurement processes is underscored to ensure improvement in value of the procured projects.

The stakeholder theory emphasizes the need for implementing supply chain risk monitoring in procurement performance undertaken prudently in a transparent manner in order to ensure projects meet value for money component. This theory plays a key role in risk monitoring by offering a broad look into the importance of public confidence and financial soundness of bidders to procurement project. This theory plays a key role in risk management by offering a broad look into the importance of meeting supply chain user needs and value for money in procurement processes.

Conceptual Framework

A conceptual framework is a tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny. It helps sets principles taken to structure inquiry and used to provide a thesis presentation. It helps the research to explain the relationship among interlinked concepts such as the explainer and explanatory variables (Kombo, 2006). It will be conceptualized within the dependent-independent variable components and their indicators. The figure 1 below; highlights the relationship between the dependent and independent variables.
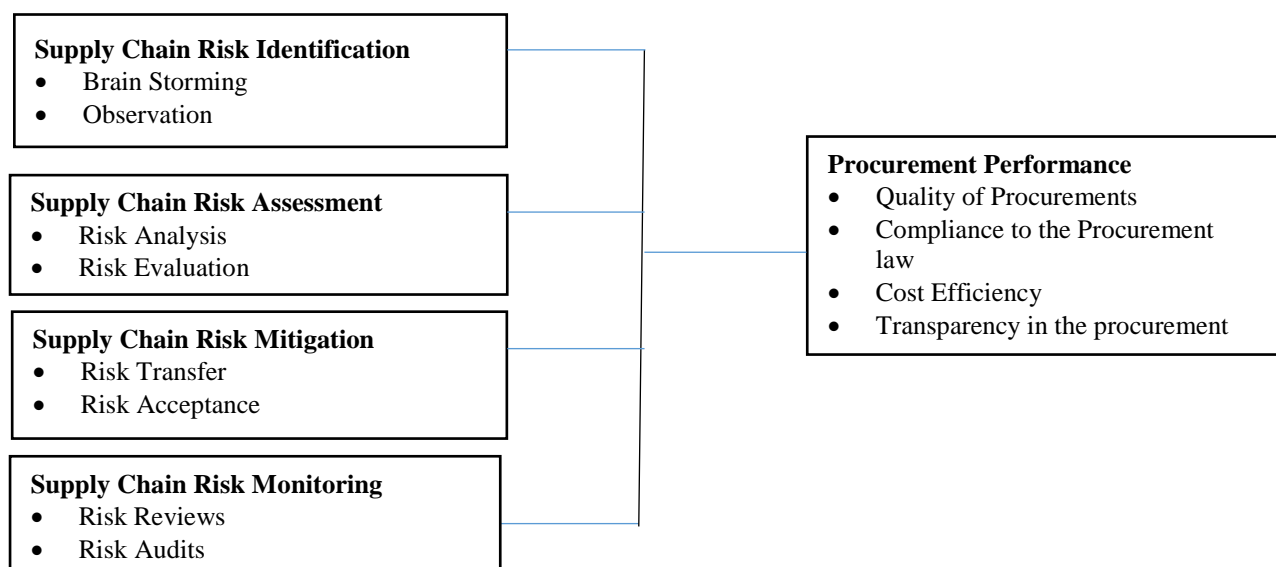

Figure 1: Conceptual framework

Critique of Existing Literature

It is notable from the literature review that there is no common acknowledgement on the different types of supply chain risks amongst the different players in procurement performance. The model of supply chain risk management is not fully acknowledged by practitioners of procurement profession in the County Government (Gkritza & Labi, 2008). Similarly, there is no common view by the key stakeholders and players in matters supply chain risks. The literature available has narrowed on the phases or stages for risk management and the function of risk management in general procurement operation. It is notable that most literature acknowledges that supply chain risk management, however, matters on how to implement risk management strategies is not very clear. Further, most literature deems procurement process as a process that is well legislated, organized and standardized just like the production process and manufacturing. However, public procurement processes are often affected by the long duration which in the process increases the probabilities of risk and uncertainty events, affecting both cost and schedule of delivery. When there are time over-runs where there is time lag, projects may take so many years to complete, the projects may require additional overheads in terms of contingency sum which may make it expensive to the implementing agency. Whereas substantial literature is available on how to calculate risk, there is very little acceptance of the fact that extended process durations brings about risks that cannot be adequately analyzed and quantified (Eskesen et al, 2004).

The general production process often works without knowledge of the clientele. Products are generally developed then marketed. However, in procurement and the entire supply chain, the client is known and determines project success. The procuring entity or client dictates a number of parameters such as: the location; quality; size and purpose of a procurement need and here is where the first source of risks emanates. Most literature ignore this challenge of the source of risk and the fact that acceptance of risk is paramount and may cause project failure. While such matters on risk management are appreciated, there is no theory on how to ensure that the procurement process is well integrated.

Research Gap

Khan and Ahmad, (2001), argue that sources of risk may be internal or external to the organization that should be the target in the identification of risks. The threats may come from unidentified categories outside the known ones such as shareholders, customers and regulatory and legislative bodies such as the government (Wallace & Blumkin, 2007), because risks mutate. According to Smith, (2006), risk control is the process of minimizing or decreasing the frequency of organization exposure to uncertain events using least cost. Soyemiet Ceric, (2003), risk managers should put in place a working management information system to help monitor levels of risk and facilitate timely review of positions of risk plus their exceptions.

Empirical research on risk identification, assessment, mitigation and monitoring focuses on risks in international and national procurement projects, the available research fail to provide framework for procurement risk management from county government procurement perspective. Literature reviewed on role of procurement risk management on organizational performance indicates that effective procurement risk management positively impact performance. The review indicates that risks emanating from procurement practices are part of projects. The degree of risk depends on complexity, schedule and budget, and location. There is a need to adopt and execute procurement risk management strategies in functional areas in supply chain. Researchers and professionals have done a lot on matters procurement risk management, however, very little work has been done on examining the effects of supply chain risk management on the procurement performance (Chapman & Ward, 2007).

3. SUMMARY OF LITERATURE REVIEW

Research indicates that organizations performance is influenced by a combination of factors facing the organization, assessment of the existing studies, noted that indicate the reasons of concerns with risk management. Carbone & Tippet, (2004), provided that the main reason for risk management by organizations is for existence, assures the continuity of the firms, and thus ensures organizations meets its goals for existence and hence ensuring that the firm is protected from getting into losses that might emanate from risks. From the available research, it is clear that decisions made by those in position of influence often affect the risks and performance of supply chain. Proper risk management strategy often affects the goals of organizational existence, stakeholder's interests and interests of those in authority. As such this will influence the development of a risk management program in the all-functional areas of the organization to meet organizational policies.

4. RESEARCH METHODOLOGY

The research design used in this study was descriptive research design. The target population comprised of 400 respondents who was drawn from procurement and other user's departments from Kericho County Government. The sample choice for the study targeted a sample of 120 which forms the unit of analysis, respondents drawn from the Procurement, Infrastructure, Finance and Accounting, Internal Audit and Administration sections from Kericho County forms the unit of observation. The use of 120 respondents in the study was adequate grounded on the commendations of Mugenda and Mugenda (2009), who indicated that a descriptive study should include at minimum thirty percent 30% of the entire population. Sample size of 120 represents 30% of the population was deemed appropriate. The sample obtained from the population was representative of the same population. This was accomplished by using stratified random sampling approach. The researcher used questionnaires as the research instrument to gather the relevant information needed related to the study. Primary data was collected through issuance of questionnaires to staff in the Procurement, Finance and Accounting, Internal Audit, Infrastructure and Administration. The study carried out a pilot test to test the validity and the reliability of the research instruments in gathering the appropriate data required for purposes of the study. The research gathered from the respondent's quantitative data. The research used correlation analysis to measure the relationship between variables to reduce problems associated with multi-collinearity. The researcher utilized regression analysis, analysis of variances (ANOVA) and measures of central tendency to analyze data. Data was then summarized and presented by the use of tables and percentages.

Model

Analysis of data used multiple regressions to test the research questions

$Y=\beta 0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4 +\epsilon$

Where,

Y= County Procurement Performance

X_1: Supply Chain Risk Identification

X_2: Supply Chain Risk Assessment

X_3: Supply Chain Risk Mitigation

X_4: Supply Chain Risk Monitoring

5. RESULTS AND DISCUSSION

Correlation Analysis

As indicated in the table 1 below, supply chain risk identification is associated positively with procurement performance at correlation factor of 0. 654.While the dependent variables-supply chain risk assessment, supply chain risk mitigation and supply chain risk monitoring- are positively associated with the procurement performance at 0.562, 0.653 and 0.677 respectively. Further, the analysis indicates that there no perfect correlation between the variables, hence the variables are suitable for regression analysis. These results are consistent with Kamoni P., (2018) who noted that there are significant associations between the procurement risk management and procurement performance, but the extent of the determinant's influence varies from the most effective to the least effective determinants.

Table 1: Correlations Analysis

		SCRI	SCRA	SCRMI	SCRMO	PP
SCRI	Pearson Correlation	1	.523*	.509**	.562**	.654**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	110	110	110	110	110
SCRA	Pearson Correlation	.523*	1	.417*	.442*	.562**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	110		110	110	110
SCRMI	Pearson Correlation	.509**	.417*	1	.537**	.653**

	Sig. (2-tailed)	.000	.000		.000	.000
	N	110	110	110	110	110
SCRMO	Pearson Correlation	.562**	.442*	.537**	1	.677**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	110	110	110	110	110
PP	Pearson Correlation	.654**	.562**	.653**	.677**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	110	110	110	110	110

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

6. REGRESSION RESULTS

Regression analysis undertaken to determine the degree of reliance of independent variable (supply chain risk identification, supply chain risk assessment, supply chain risk mitigation and supply chain risk monitoring in explaining the variation in the dependent variable (procurement performance).

Supply Chain Risk Identification

The analysis of regression was undertaken to determine whether the independent variable, Risk identification can be relied on in explaining the variation in the dependent variable, on the procurement performance. The Results in Table 2 indicate that the adjusted r^2 was 0.717 indicating that the independent variables, risk identification explained 71.7% of the influences procurement performance of County Government in Kenya.

Table 2: Supply Chain Risk Identification Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.848ᵃ	.719	.717	.18848

a. Predictors: (Constant), Supply Chain Risk Identification

Supply Chain Risk Assessment

The regression was undertaken to determine whether the independent variable- risk assessment- can be relied on in explaining the change in the dependent variable, on the county procurement performance. Results in Table 4.3 indicate that the adjusted r2 was 0.880 indicating that the independent variables, risk assessment explained 88% of the performance of procurement in County Government in Kenya.

Table 3: Supply Chain Risk Assessment Regression Model Summary

Model	R	R squared	Adjusted R Squared	Std. Error of the Estimate
1	.940ᵃ	.884	.880	.11396

a. Predictors: (Constant), Supply Chain Risk Assessment

Supply Chain Risk Mitigation

The regression undertaken to determine whether the independent variable, procurement risk mitigation can be relied on in explaining the change in the procurement risk mitigation, on the procurement performance. Results in Table 4 indicate that the adjusted r2 was 0.650 indicating that the independent variables, risk mitigation explained 65% of the procurement performance of County Governments in Kenya.

Table 4: Supply Chain Risk Mitigation Regression Model Summary

Model	R	R Square(r^2)	Adjusted R Square	Std. Error of the Estimate
1	.808ᵃ	.653	.650	.20947

a. Predictors: (Constant), Supply Chain Risk Mitigation

Supply Chain Risk Monitoring

The regression was done to determine whether the independent variable, risk monitoring can be relied on in explaining the change in the dependent variable-supply chain risk monitoring, on the procurement performance of County Government in Kenya. Results in Table 5 indicate that the adjusted r2 was 0.911 indicating that the independent variables, risk monitoring explained 91.1% of the procurement performance of County Government in Kenya.

Table 5: Supply Chain Risk Monitoring Regression Model Summary

Model	R	r^2	Adjusted r^2	Standard. Error of the Estimate
1	.956a	.915	.911	.09366

a. Predictors: (Constant), Supply Chain Risk Monitoring

7. REGRESSION ANALYSIS MODEL SUMMARY

A multiple linear regression analysis was specifically done to investigate the effect of the independent variables on the dependent variable. The input into the regression model was obtained using the average scores for the four independent supply chain variables (risk identification, risk assessment, risk mitigation and risk monitoring). The dependent variable-procurement performance– where measure of procurement quality was used. The standard error of the regression model is 0.16 as indicated in Table 6. Results in Table 4.6 indicate that the adjusted r2 was 0.792 indicating that the independent variables explained 79.2% of the procurement performance of County Government in Kenya. This indicates that the model had good explanatory power.

Table 6: Regression Analysis Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.894a	.800	.792	.16144

a. Predictors: (Constant), Assessment, Identification, Mitigation, Monitoring

Analysis of variances is important allows the researcher to determine if the difference in means values are by chance or if they are indeed significantly different. The regression output in Table 4.6 presents the source of variance, mean of variances and the f value. In statistics, p-value between 0.000 and 0.005 are normally accepted to be significant in statistical inference. In this case, p-value is 0.000b and this provide sufficient evidence to conclude that the regression model fits the better the data obtained in this research. The results indicate that the overall model was significant and could provide important results. This indicates that the model could provide some predictive significance and was a good fit.

Table 7: Analysis of Variance of the Regression

ANOVAa						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	10.936	4	2.734	104.905	0.000b
	Residual	2.737	105	.026		
	Total	13.673	109			

a. Dependent Variable: Performance

b. Predictors: (Constant); Identification, Assessment, Mitigation, Monitoring

Further, the regression output on significance of the independent variables is presented in Table 8

Table 8: Significance of Independent Variables

Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	692	.033		.000	.000
	Identification	0.737	.045	.837	16.252	.001
	Assessment	0.898	0.048	0.799	17.230	.002
	Mitigation	0.583	.052	.725	11.189	.004
	Monitoring	0.981	.040	.917	24.402	.003

a. Dependent Variable: Performance

In statistics, a t-statistic of 2 and above as well as p-value between 0.000 and 0.005 are normally accepted to be significant in statistical inference. Risk identification, risk assessment, risk mitigation and risk monitoring were all found to be statistically significant as all their t-statistic values were above 2 and also as the range of their p-value was between 0.000 and 0.005. The results in the regression coefficient to the model $Y = .692 + .737X_1 + .898X_2 + .583X_3 + .981X_4$. The model coefficient was significant at 5% level of confidence because the significance of X_1, X_2, X_3 and X_4 were 0.001, 0.002, 0.004 and 0.003 respectively. Similarly, the constant term was significant at .000.

The results in Table 8 indicate that risk identification positively influences procurement performance of County Government. Further, it tells that supply chain risk identification is a starting point of any risk management program since an organization cannot manage what it does not know and plays a vital role in influencing performance of procurement in County Government. On the other hand, once risks have been identified, evaluation follows before incorporating risks mitigation aspects and ensures implementation of risks for the organizations success.

Risk assessment had important and positive effect on the procurement performance of Counties in Kenya. This implies that risk assessment enables the management to divide supply chain management risks that are threatening the existence of the project from those which can cause slight damages. Therefore, procurement risk assessment must be assessed, analyzed and evaluate which includes identification of the probability distributions of outcomes for each material risk. This will call for prioritization of risks which includes the determination of the contribution of each risk to the aggregate risk profile, and appropriate prioritization which in turn will enhance performance of procurement projects.

Further, risk mitigation has a significant and a positive effect on procurement performance of County Government in Kenya. This implies that risk can be managed through selection of one or a combination of available risk management techniques for mitigating loss exposure through risk control and risk financing which in turn enhances the procurement performance of County Government in Kenya. Therefore, should adopt risk mitigation process to minimize or reduce the frequency of the firm's exposure to uncertainty.

Risk monitoring had significant and a positive outcome on procurement performance of County Government in Kenya. This implies that when an appropriate risk monitoring strategy is put in place, it means that appropriate product model in line with estimated risk is achieved which in turn influence performance of infrastructure projects. Risk monitoring can create a pointer on what is going wrong and discover mistakes at early stage. Effective monitoring of supply chain risks requires robust reporting and review structure to ensure that appropriate controls and responses are in place. The research shows that there exists adequate support and linkages in the literature provided by various scholars on the dependent and independent variables of this research.

8. CONCLUSION

This study established that risk identification significantly and positively influences procurement performance of County Government in Kenya. The study also established that supply chain risk assessment had a significant and positive impact on the county procurement performance. The study further established that role of supply chain risk mitigation was major and a positive in performance procurement of County Government in Kenya. Finally, risk monitoring had significant and a positive effect on procurement performance of County Government in Kenya as established in the study

9. RECOMMENDATION

Risk identification was noted to have a considerable effect on the supply chain performance of County Government in Kenya as established in the study. The study recommends that the County Government should ensure procurement risk identification process is integrated with other program based management processes.

It was also recommended that County Government of Kericho should develop and implement appropriate mechanisms for analysis and evaluation of risks to enhance procurement performance. The County should continuously assess their proposed risk assessment practices to gauge their practicability in the current fast changing operational environment.

The study further recommends that risk mitigation planning which includes activities to be undertaken to mitigate against risks should be put in place by County Governments. Risk mitigation process should entail planning of the activities that recognizes, evaluates, and pick out options to set risk at minimum tolerable levels. Risk mitigation planning should be intended to enable program success.

The study finally recommended that County Governments should ensure appropriate risk control and monitoring management strategies are developed and implemented. County Government should embrace proper reporting structures that gives feedback on the proposed supply chain risk mitigation strategies employed to track its success or failure and development of risk controls mechanisms for effectively identification, assessment and development and implementation of appropriate risk mitigation measures to increase performance of procurement projects.

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