

**DETERMINANTS OF SUCCESSFUL IMPLEMENTATION OF ROAD
CONSTRUCTION PROJECTS IN THE COUNTY OF MURANGA IN KENYA**

Rachel Njeri Mbugua

Msc. Project Management,
Jomo Kenyatta University of Agriculture & Technology

Dr. David Kiarie Mburu

Lecturer
Jomo Kenyatta University of Agriculture and Technology

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ABSTRACT

The general objective of this research was to examine determinants of successful implementation of road construction projects in the County Government of Murang'a. The study specific objectives were; determine the extent to which managerial skills affects successful implementation of road construction projects in the County Government of Murang'a; establish the effect of procurement procedures on successful implementation of road construction projects in the County Government of Murang'a; assess the effect of financial resources allocation on successful implementation of road construction projects in the County Government of Murang'a; establish the effect of project monitoring and controlling on successful implementation of road construction projects in the County Government of Murang'a and identify the moderating effect of government policy on successful implementation of road construction projects in the County Government of Murang'a. The study adopted a descriptive research design and the target population comprised of 132 staff involved in implementation of road construction projects in Murang'a County. The study applied a stratified random sampling technique to select 66 respondents as the sample size for the study. The main data collection instrument was a questionnaire containing close ended questions thus utilizing a nominal format. A pilot study was carried out to test the reliability and validity of the questionnaire. Descriptive statistics data analysis method was applied to analyze data aided by Statistical Package for Social Sciences (SPSS) to compute responses frequencies, percentage mean and standard deviation results. Finally Multiple Linear Regression model was employed to establish the significance of the independent

variables on the dependent variable. The findings were presented using tables and charts. The study concluded that financial resources is the major factor that determines most successful implementation of road construction projects with a coefficient 55.4%, followed by managerial skills, then project monitoring and controlling and lastly procurement procedures. The study suggested the following recommendations as a measure to improve on implementation of road construction projects. The study recommended for training and recruitment of professionally trained and competent project management staff. The management of the County Government should follow procurement methods in accordance with all the public procurement regulations especially during selection of contractors. The County Government should allocate enough financial resources for road construction projects. Contractor should be paid in time and effective financial management practices should be employed. Effective project monitoring and controlling methods should be employed and the government should enforce and ensure that all regulations that guide in road constructions are implemented.

Key Words; Government policies, Managerial skills, Project, Project implementation, Project management, monitoring and controlling

Background to the Study

Globally, successful completion of road construction projects is a critical issue that determines the state of public infrastructure in any country. Better roads leads to rapid economic growth and development of many countries. However, most road construction projects like other projects fail because of absence of clean indicators for monitoring and measuring project success. In developed nations such as USA and Canada, effective implementation of road construction projects have led to the existence of good road infrastructure which have contributed enormously towards increased country's economic growth and development (Boyne & Walker,2008).

However, just like other countries, at some time successful completion of road construction projects fail due to weather conditions and lack of proper drive that lead to failure to generate interests and support which should be gapped by proper bridging whereby every stake holder should be made sure to see why the project is important. In Japan, the first challenge of project implementation is ensuring that a project is delivered

within the defined constraints. The second, more ambitious, challenge is the optimized, allocation and integration of the inputs needed to meet those pre-defined objectives.

The project, therefore, is a carefully selected set of activities chosen to use resources, time, money, people, materials, energy, space, provisions, communication, quality, risk, to meet the pre-defined objectives (Mantel, 2012). Road construction projects are mostly part of public projects that are undertaken by governments to improve the living standards of the targeted beneficiaries who are mostly the countries citizens.

Chandra (2008) cites examples of public projects such as; investment in a public transport system like construction of a new railway line or expansion of the existing railway infrastructure, development of public housing, research and development, training, and so on that are expected to generate benefits over a period of time. Such public projects can be classified either as strategic investments to address long-term organizational goals with a significant impact on the overall direction of the concerned public entity, or tactical investments to implement a current strategy as efficiently or as profitably as possible (Bartik, 2009).

Project implementation activities are part and parcel of the day-to-day operations of any organization, be it private or public which was the primary focus of this study. Government policies influences many public organizations or Government institutions to engage in project activities like in the US Government involvement in public works projects was motivated by jobs creation policy while improving the nation's infrastructure. The policy was established by Title II of the National Industrial Recovery Act (NIRA), the Public Works Administration (PWA) was an expansive, Depression-era Federal government spending programme that not only aimed to expand job opportunities

but also enhance infrastructure which would ultimately stimulate economic growth.

In recognizing the essence of having a structured administration of public works projects, the US Government in 1933 set up a state agency called Public Works Administration (PWA) to provide oversight and to coordinate all public works projects. Equally, several other countries of the world, including France and Germany among others, have been driven by the motivation to address certain inadequacies, imbalances or gaps existing in the economy which the private sector alone could not otherwise effectively deal with (Corsten, 2009).

Empirical data demonstrated that organizations which implement their projects effectively perform better with higher productivity levels. A case in point was the Indigenous Honeybees Project in the Himalayas by the Government of Nepal, Gurung (2002) and other scholars including Brown and Hyer (2010) also hold this view contending that organizations with systematic project management processes are more effective and successful than those on the lower Project Management Maturity scale giving the example of Quadrant Homes Company. The company ranks high in terms of project management maturity. Arising from the foregoing, the current study seek to identify factors that influence successful public sector project implementation and best practices in public project implementation (Otieno, 2012).

Previous studies on public projects similar to road construction project have demonstrated that there exist a myriad challenges that impede their successful project implementation. According to Chandra (2008), poor planning has been a major constraint in successful completion of public projects in India culminating in projects becoming uneconomical as a result of time and cost over-runs.

The end result has been retarded economic development. This view was supported by Oladipo (2008) who evaluated local government projects in Nigeria where he identified key project impediments as poor project planning, inadequate quality manpower, inadequate finance and poor project monitoring. Alazwa (2010) pinpointed out that in Uganda and Tanzania the key challenges to successful implementation of road construction projects included; professional personnel, material management, financial management, project monitoring and controlling and government policies.

According to Kenya National Audit Office (KENAO) (2010), the ministry failed to successfully implement many road construction projects within the stipulated contractual period and initial budget. The contractors blamed this failure on delayed payments and unforeseen but necessary works associated with the project. This clearly pointed to poor financial management, project monitoring and controlling and government policies challenges amongst many others (Otieno, 2012). Existence of road projects successful completion challenges leads to poor road infrastructure in the country.

Road transport infrastructure in Kenya represents a significant portion of the government's total financial investment in fixed assets. The scope of road transport infrastructure comprises the entire road network in Kenya and includes all road facilities upon which road transport operates. Kenya has a public road network of 160,886 km of which 61,946km is currently classified while 98,940 km is unclassified. The Current Road Classification System, which was developed in the 1970s, has six road classes i.e. Classes A to E and a Special Purpose Road class. Each class is defined by the functional

criteria related to administrative level of centers the roads connect (Otieno, 2012).

The consequences of gaps in successful completion of road construction projects are unlimited ranging from wastage of the limited public resources, inadequate service delivery to the public to impeding economic development of the country with the ultimate result of perpetual high poverty levels among the world's majority populace (Chandra, 2008). Previous studies in Kenya have provided evidence of the existence of a serious problem of ineffective project implementation within the public domain. A case in point is the ministry of roads failed to realize its key strategic objectives by successfully implementing the northern and southern roads bypass in time. The project was not achieved within the contractual period and the contractor blamed it on delayed payments and change in government policies (Alazwa, 2010).

Successful completion of road construction projects is a critical issue that determines the pace of country's economic growth and development. Kenyan economy relies mostly on agriculture and thus lack of good roads leads to loss of farm produce and increased level of poverty by many farmers hence leading to declined economic growth. A study by Muli (2013) found out that existence of road construction projects implementation challenges has contributed to having over 80% of projects in the country to be behind schedule.

Further evidence of the problem in Kenya was exhibited by Kirungu (2011) in a study on factors influencing implementation of Donor Funded Projects. She observed that the Financial and Legal Sector Technical Assistance Project (FLSTAP) under the Ministry of Finance (The National Treasury) has faced challenges to do with implementation and therefore not able to achieve its goals within the stipulated timeframes.

She further cited a World Bank Report (2009) which indicated that the current average project funds absorption rate was less than 10% per annum which was attributed to a constrained procurement process. On his part, Omanga (2010) found out that 21% of road Projects in many Constituencies had either stalled or abandoned altogether.

Statement of the Problem

In many County governments like Murang'a County, implementation of road construction projects has been a major challenge. However, in some county governments like Machakos County, implementation of road construction projects has been a major success. In the year, 2013-2014, the Machakos County government invested Kshs 1.6 billion in over 30 road construction projects which were successfully completed. In Murang'a County, energy, transport and infrastructure departments had the highest expenditure of Kshs 885.95 million which was spent on gravelling of roads and water projects among other infrastructures (Ngunjiri, 2016). However, over 5000 Km of feeder roads graded, leveled and graveled still remains poor (Dikemebr, 2015).

In 2013, Murang'a County had 2,934.95 Km of road. Of these, 387.5 Km are bituminized, 1313.1 Km are graveled and 1234.3 Km is earth surface. In the year 2014, twenty of the completed road construction projects were poor and in the year 2014 out of 30 completed road construction projects only 16 were successfully completed as the rest 14 were poorly completed in terms of quality of the road and compliance with the projects time frame (Maina, 2015). A number of studies have been conducted on project management related issues; Kariungi (2014) did a study on determinants of timely

completion of projects in Kenya Power and Lighting Company;

Githenya & Ngugi (2014) assessed the determinants of implementation of housing projects in Kenya; Gaturu, & Muturi (2014) did a study on factors affecting the timeliness of completion of donor-funded projects in Kenya World Agro Forestry Centre and Kahura (2014) conducted a study on factors influencing effective and efficient delivery of road construction projects in Nairobi County. However, there lacked a specific study that had focused on determinants of successful implementation of road construction projects in the County Government of Murang'a. This study hence aimed to fill the missing knowledge gap by examining the determinants of successful implementation of road construction projects in the County Government of Murang'a.

Objectives of the study

- i. To determine the extent to which managerial skills affects successful implementation of road construction projects in the County Government of Murang'a.
- ii. To establish the effect of procurement procedures on successful implementation of road construction projects in the County Government of Murang'a.
- iii. To assess the effect of financial resources allocation on successful implementation of road construction projects in the County Government of Murang'a.

- iv. To establish the effect of project monitoring and controlling on successful implementation of road construction projects in the County Government of Murang'a.
- v. To identify the moderating effect of government policy on successful implementation of road construction projects in the County Government of Murang'a.

Literature Review

Managerial skills comprises of knowledge and competences that enables managers to have ability to make key decisions that support execution of project management functions in a way that leads to achievement of the project goals. Managerial skills includes; human skills that enables managers to be able to motivate and interact with the project implementation team, technical skills that gives managers ability to have knowledge and proficiency in execution of project management functions and conceptual skills that gives managers ability to understand concepts, develop ideas and implement strategies (Walker and Vines,2008). During project implementation managerial skills are determined by ability of the project managers to apply leadership skills, team work skills, communication skills. Lack of managers with project management skills makes it difficult for the project managers to develop and implement effective project implementation strategies that lead to management of project implementation challenges and successful implementation of road construction projects (Jaselskis &Ashley, 2007).

Procurement is the process of buying goods, works or services and procurement procedures are methods a company uses to acquire goods and services. Some of the most

common procurement procedures used in public projects in Kenya includes, open tendering, request for quotation and direct procurement (Phillip, 2008). Lack of accountability and transparency affects execution of procurement procedures in accordance to public procurement and disposal act 2005.

Poor execution of procurement procedures leads to award of tenders to unqualified contractors who lacks human resource capacity in implementation of road construction projects. This leads to construction of poor quality roads and delay in implementation of road construction projects. Procurement procedures are determined by procurement methods, accountability and level of compliance with public procurement act 2005.

Financial resources are funds required to finance implementation of road construction projects (Fugar, 2010). Delay in allocation of funds to various contractors leads to project delay and this affects completion of road projects within the set time frame. In addition, lack of allocation of enough funds makes it difficult for the contractors to procure high quality materials and hire qualified personnel to facilitate construction of quality roads. On the other hand use of poor financial management practices affects allocation of the required funds in each project activity and this stalls project implementation process. Poor financial management methods affects organizing and managing project resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints. The effect of financial resources on successful project implementations is determined by road funds allocation, contractor's payment and financial management practices (Okoth, 2007).

Project monitoring and controlling involves regularly measuring project implementation progress to ensure that the project is meeting its objectives and addressing current

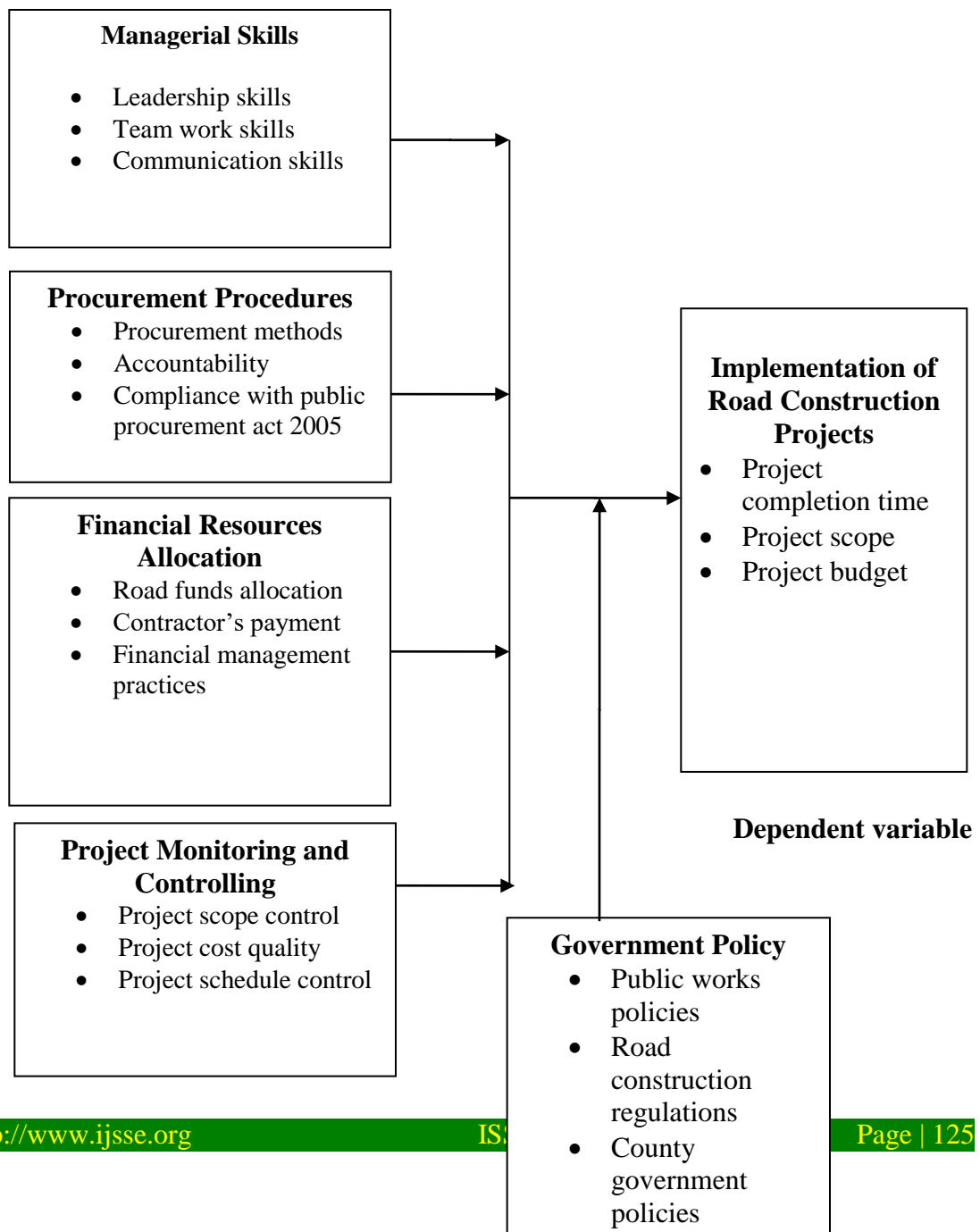
business needs (Jeffry, 2009). The project manager and other staff monitor progress against plans and take corrective action when necessary. The monitoring and control process consists of those processes performed to observe project execution so that potential problems can be identified in a timely manner and corrective action can be taken, when necessary, to control the execution of the project. Lack of effective project monitoring and controlling methods affects delivering of projects within the defined constraints and this affects successful implementation of road construction projects. The most important aspects of project monitoring and control in road construction projects include; project scope control; project cost control and project schedule control (Meredith, 2012).

Government policies play a crucial role in determining how road construction projects are successfully completed in the country. Procurement regulations determine the choice of contractors and the Kenya Roads Act 2007 determines the road state corporations to oversee the implementation of the road construction contract. The enactment of the new constitution has led to change of government policies on matters of allocation of road construction funds where counties have been given some mandate to oversee implementation of certain road construction projects. This has increased confusion between the county administration and the ministry of roads hence leading to delay or lack of implementation of various road construction projects (Eyiah, 2007).

Conceptual Framework

According to Orodho (2009) a conceptual framework describes the relationship between the research variables. Sekeran (2003) argues that a variable is a measurable characteristic that assumes different values among subjects. An independent variable is

that variable which is presumed to affect or determine a dependent variable (Dodge, 2009). A dependent variable is a variable dependent on another variable like the independent variable. A dependent variable is the variable which is measured in the research study (Kothari, 2006).



Independent Variables

Figure 1; Conceptual Framework

Moderating Variable

Critique of Literature

Review from the empirical literature demonstrates that, although many studies have been undertaken on project management and implementation, many studies have addressed different aspects of project management and have been undertaken in different regions. None of the studies have examined determinants of successful implementation of road construction projects in the County Government of Murang'a. A study by Reichelt & Lyneis (2009) found out that in UK and Germany managerial skills plays a significant role in enhancing effective execution of construction projects and ensures successful completion of many public construction projects especially in road sector. However the study was undertaken in developed nation and thus did not examine determinants of successful implementation of road construction projects in Kenya.

Fugar (2010) found out that managerial skills such as, human resource management skills, project management skills and leadership skills among many contractors in developing nations affected project implementation. However he failed to explain how managers in road construction should acquire and employ effective project managerial skills. Hubbard (2005) suggested in Africa, to ensure success of many construction projects, by using the management tools, the project managers would be able to plan and execute their construction projects to maximize the project's chances of success. The

study did not specify the management tools that are suitable to be adopted by contractors in road construction sector in countries like Kenya.

A study by Muli (2013) found out that in Kenya, most projects managers' lacks professional training in project management and this denies them capacity to execute project implementation activities effectively. However the study did not provide a solution on how project managers should be trained or how contractors should acquire professional trained project managers.

Finding from Phillip (2008) study showed that many developing nations in Africa lack transparent procurement methods and this hampers successful implementation of many public projects and road construction projects being the most affected. The study however did not explain how procurement procedures affect successful implementation of road construction projects. Okoth (2007) found out that application of ineffective procurement procedures that lacks transparency and do not strictly adhere to the stipulated guidelines in the procurement and disposal act leads to award of tenders to unqualified contractors who lacks capacity to implement road projects.

This study will show how procurement procedures affect successful implementation of road construction projects. Mwelwa (2009) study showed that delay in funds allocation to road contractors affects successful implementation of road construction projects in Kenya. This is mostly witnessed in cases where contractors are not paid in time or when the allocated funds by the government for road construction are misappropriated and not accounted for. Further studies are required to show how financial resources allocation affects successful implementation of road construction projects in the County

Government of Murang'a.

Waweru (2009) study found out that many road construction firms in Kenya lacks clean indicators for monitoring and measuring project success the study did not suggest how project monitoring and controlling should be improved to enhance successful implementation of road construction projects.

Research Gaps

Review from the empirical literature demonstrates that there lacks a specific study that has addressed determinants of successful implementation of road construction projects in the County Government of Murang'a. A study by Reichelt & Lyneis (2009) found out that in UK and Germany managerial skills plays a significant role in enhancing effective execution of construction projects and ensures successful completion of many public construction projects especially in road sector.

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Mwelwa (2009) study showed that delay in funds allocation to road contractors affects successful implementation of road construction projects Kenya. Waweru (2009) study found out that many road construction firms in Kenya lacks clean indicators for monitoring and measuring project success. It is hence evident that a rich gap in literature exists on determinants of successful implementation of road construction projects in the County Government of Murang'a. This study therefore aims to fill the missing gap in assessing determinants of successful implementation of road construction projects in the County Government of Murang'a with emphasis on managerial skills, procurement procedures, financial resources allocation and project monitoring and controlling.

Research Design and Methodology

The study adopted a descriptive research design. Descriptive research designs could be used in both quantitative and qualitative research projects Mugenda (2008).

The target population was a total of 132 staff working in road construction projects in Murang'a County. Questionnaires were preferred because according to Dempsey (2003) they are effective data collection instruments that allow respondents to give much of their opinions pertaining to the research problem. Descriptive statistics was preferred because it aids the study to meaningfully describe the population of study; descriptive statistics was used to compute data frequency, percentage, percentage mean and STD deviation results. Inferential statistics was also deemed appropriate since it assists in making

inferences about a population based on results of a representative sample. This aided the study to generalize the findings of the study to the population. The Statistical Package for Social Sciences (SPSS) version 23 was used to aid in data analysis. Whereby data Presentation was in the form of tabulated summaries and percentages presented using tables and charts. The analyzed data was then presented using frequency tables and bar graphs. Inferential statistics was used to analyze quantitative data through the use of Multiple Regression model to establish the significance of the independent variables on the dependent variable.

The following multiple regression model was used to test the significance relationship of independent variables against the dependent variable

$$Y = B_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon_i$$

Where:

Y= Successful Implementation of Road Construction Projects (Dependent Variable)

X₁ = Managerial Skills (Independent Variable)

X₂ = Procurement Procedures (Independent Variable)

X₃= Financial Resources Allocation (Independent Variable)

X₄= project monitoring and controlling (Independent Variable)

ε. = error term

B₀ = constant of regression

Correlation analysis was conducted to test the strength of relationship between the research variables and Analysis of Variance (ANOVA) was used to test the significance of the relationship between research variables.

Study Findings

The study conducted an analysis of response rate to determine the actual number of the respondents who answered and submitted back the questionnaires for data analysis. The response rate was (44) 67% of the total sample size and the non-response rate was (19) 33%. The response rate of 67% was accepted since it helped in gathering sufficient data that was generalized to reflect the opinions of respondents on determinants of successful implementation of road construction projects in the County Government of Murang’a.

Project Implementation

Table 1 shows the number of completed projects within time in the last five years in the County.

Table 1: Number of Completed Projects within Time in the Last Five Years

Projects	Years									
	2011		2012		2013		2014		2015	
1 to 3	6	14%	10	23%	7	16%	8	18%	6	14%
4 to 6	9	20%	8	18%	9	20%	9	20%	10	23%
7 to 10	10	23%	9	20%	12	27%	9	20%	9	20%
11 to 13	7	16%	8	18%	5	11%	7	16%	6	14%
14 to 17	5	11%	4	9%	6	14%	8	18%	8	18%
Over 17	7	16%	5	11%	5	11%	3	7%	5	11%

Respondents were requested to indicate the number of completed projects within time in

the last five years in Murang’a County. According to Table 1, the study established that majority (16%) of the respondents indicated that the number of completed projects over 17 projects in year 2011; 27% indicated the number of completed projects were between 7 to 10 in year 2013 while 20% showed that the number of completed projects were between 7 to 10 in year 2014.

Generally the findings indicate a low increase of the number of completed projects within five years across the years where the highest increase is recorded in year 2013.

Table 2; shows the number of implemented projects within scope in the last five years in the County.

Table 2: Number of Completed Projects within Scope in the Last Five Years

Projects	Years									
	2011		2012		2013		2014		2015	
1 to 3	8	18%	8	18%	4	9%	4	9%	6	14%
4 to 6	14	32%	10	23%	7	16%	8	18%	10	23%
7 to 10	11	25%	9	20%	9	20%	12	27%	8	18%
11 to 13	3	7%	5	11%	12	27%	5	11%	9	20%
14 to 17	5	11%	7	16%	8	18%	9	20%	6	14%
Over 17	3	7%	5	11%	4	9%	6	14%	5	11%

Respondents were requested to indicate the number of completed projects within scope in the last five years in Murang’a County. According to table 2; the study established that majority (32%) of the respondents indicated that the number of completed projects within scope is between 4 to 6 projects in year 2011; 27% indicated the number of completed projects within scope were between 7 to 10 in year 2014 while 20% showed that the

number of completed projects within scope were between 11 to 13 in year 2015.

Generally the findings indicate a low increase of the number of completed projects within scope across the years where the highest increase is recorded in year 2011.

Table 3; shows the number of projects implemented within budget in the last five years in the County.

Table 3: Number of Projects Implemented Within Budget in the Last Five Years in the County

Projects	Years									
	2011		2012		2013		2014		2015	
1 to 3	6	14%	7	16%	8	18%	6	14%	6	14%
4 to 6	7	16%	9	20%	9	20%	9	20%	9	20%
7 to 10	9	20%	10	23%	10	23%	10	23%	8	18%
11 to 13	10	23%	6	14%	5	11%	6	14%	9	20%
14 to 17	8	18%	7	16%	9	20%	9	20%	7	16%
Over 17	4	9%	5	11%	3	7%	4	9%	5	11%

Respondents were requested to indicate the number of completed projects within budget in the last five years in Murang’a County. According to Table 3, the study established that majority (23%) of the respondents indicated that the number of completed projects within budget in the last five years between 11 to 13 projects in year 2011; 23% indicated the number of completed projects within budget were between 7 to 10 in year 2014 while 20% showed that the number of completed projects within budget were between 11 to 13 in year 2015.

Generally the findings indicate a low increase of the number of completed projects within scope across the years where the highest increase is recorded in year 2011.

Regression Analysis

The study applied regression analysis to establish the statistical significance relationship between the independent variables and the dependent variable. The independent variables included; (X₁) managerial skills, (X₂) procurement procedures, (X₃) financial resources allocation and (X₄) project monitoring and controlling and the dependent variables (Y) was project implementation. Regression analysis is a statistics process of estimating the relationship between variables. Regression analysis helps in generating equation that describes the statistics relationship between one or more predictor variables and the response variable (Green & Salkind, 2003). The regression analysis results were presented using regression model summary table, Analysis of Variance (ANOVA) table and beta coefficients table. The model used for the regression analysis was expressed in the general form as given below:

$$Y = B_0 + B_1 * X_1 + B_2 * X_2 + B_3 * X_3 + B_4 * X_4 + e$$

The relationships between the dependent variable and independent variables, and the results of testing significance of the model were respectively interpreted. In interpreting the results of multiple regression analysis, the three major elements considered were: the coefficient of multiple determinations, the standard error of estimate and the regression coefficients. R squared was used to check how well the model fitted the data. R squared is the proportion of variation in the dependent variable explained by the regression model.

From the findings of the study it shows that the regression model in table 4, coefficient of determination (R²) is 0.751 and R is 0.867 at 0.05 significance level. This is an indication that the four independent variables notably; (X₁) managerial skills, (X₂) procurement

procedures, (X₃) financial resources allocation and (X₄) project monitoring and controlling significantly determined the dependent variables (Y) which was project implementation. The coefficient of determination (R², 0.751) indicates that 75.1% of the variation on project implementation is determined by, managerial skills, procurement procedures, financial resources allocation, project monitoring and controlling and government policy. The remaining 25.9% of the variation on project implementation is determined by other variables not included in the study model. This shows that the model has a good fit since the value is above 75%. This concurred with Graham (2002) that (R²) is always between 0 and 100%: 0% indicates that the model explains none of the variability of the response data around its mean and 100% indicates that the model explains all the variability of the response data around its mean. In general, the higher the (R²) the better the model fits the data.

Table 4; Regression Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.867 ^a	.751	.719	.28230

a. Predictors: (Constant), managerial skills, procurement procedures, financial resources allocation, project monitoring and controlling

The study further used one way Analysis of Variance (ANOVA) in order to test the significance of the overall regression model. Green & Salkind (2003) posits that one way Analysis of Variance helps in determining the significant relationship between the research variables. Table 5, indicates that the high value of F (22.973) with significant level of p-value 0.00 which is less than 5% level of significance is enough to conclude that all the independent variables significantly determined successful implementation of

road construction projects. This implies goodness of fit of the model and thus the variables can be carried on for further analysis to determine with significance the level of influence of each variable.

Table 5; Analysis of Variance (ANOVA)

<i>Model</i>		<i>Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	9.154	5	1.831	22.973	.000 ^a
	Residual	3.028	38	.080		
	Total	12.182	43			

a Predictors: (Constant), managerial skills, procurement procedures, financial resources allocation, project monitoring and controlling

b Dependent Variable: project implementation

Table 6, further presents the results of the test of beta coefficients which shows the extent to which each independent variable determines successful project implementation. As presented in table 4.53, (X₁) managerial skills coefficient of 0.171 was found to be positive at significant level of 0.005 and this indicates that managerial skills positively determines successful implementation of road construction projects. (X₂) procurement procedures Coefficient of 0.117 was found to be positive at significant level of 0.001 and this indicates that procurement procedures positively determine successful implementation of road construction projects.

(X₃) financial resources allocation coefficient of 0.554 was found to be positive at significant level of 0.000 and this indicates that financial resources positively determines successful implementation of road construction projects. (X₄) project monitoring and controlling coefficient of 0.143 was found to be positive at significant level of 0.000 and this indicates that project monitoring and controlling positively determines successful implementation of road construction projects. This clearly demonstrates that all the

independent variables significantly determine successful implementation of road construction projects and thus the regression equation was;

Table 6; Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.125	.262		1.096	.001
Managerial skills	.171	.114	.134	1.152	.005
Procurement procedures	.117	.179	.110	.656	.001
Financial resources allocation	.554	.168	.530	3.290	.000
Project monitoring and controlling	.143	.093	.054	.463	.000

a. Dependent Variable: Project implementation

$$Y = 0.125 + 0.554X_1 + 0.171X_2 + 0.143X_3 + 0.117X_4 + \varepsilon$$

The regression model above has established that taking all the independent variables into account notably; (X₁) managerial resources, (X₂) procurement procedures, (X₃) financial resources allocation and (X₄) project monitoring and controlling at Zero constant determines successful project implementation (0.125). The results presented also shows that taking all other independent variables at constant zero, a unit increase in managerial skills leads to a 0.171 increase in project implementation;

Improvement of procurement procedures practices leads to 0.117 increase in project implementation; a unit increase in financial resources allocation leads to 0.554 increase in

project implementation and a unit increase in monitoring and controlling leads to 0.143 increase in project implementation. The study findings thus implies that financial resources is the major factor that determines most successful implementation of road construction projects with a coefficient of 0.554, followed by managerial skills with a coefficient of 171, then project monitoring and controlling with a coefficient of .143 and lastly procurement procedures with a coefficient of 0.117. These findings concurs with finding by Edward (2012) where he identified allocation of enough financial resources and application of procurement procedures as per the procurement regulations plays a major role in determining successful completion of public projects including road construction projects in the country.

Summary of the Findings

The study found out that managerial skills affected successful implementation of road construction projects in the County Government of Murang'a. The study findings showed that leadership skills of the project implementation workforce influenced project completion time by enhancing timely decision making and problem solving during road implementation phase, by enhancing quality and quantity operations of road implementation objectives within time, and by increasing the number of roads completed on time. Leadership skills of project implementation workforce influenced project scope by enhancing decision making and problem solving during project implementation phase quality and by enhancing quantity operations of activities to meet project objectives. Leadership skills of project implementation workforce influenced utilization of projects budget by ensuring involvement of all stakeholders in funds allocation to the projects. These findings implies that leadership skills ensures involvement of all stakeholders in

funds allocation to the projects, ensures fast decision making in allocation of funds to the projects and ensures prioritization in funds allocation to the projects and also ensures that there is equity in budget allocation to the projects. The study findings showed that team work skills of project implementation workforce influenced project completion time by reducing risk of project delay and ensuring team participation in implementation of projects within time. This also translates to increased number of implemented projects within a given time frame.

Team work skills of project implementation workforce influenced project scope by ensuring all project activities are implemented ensuring team participation in project scope planning and increasing team productivity in implementation of road construction projects. Team work skills of project implementation workforce influenced project budget, by ensuring team participation in funds allocation to the projects, ensuring prioritization of funds allocation to the project's activities and by reducing the risks of funds misappropriation to the project's activities.

Communication skills of project implementation workforce influenced project completion time by ensuring project completion time is communicated during project planning, ensure continuous flow of information within project team reduces risks of project delay. Communication skills of project implementation workforce influenced project scope and budget by enhancing continuous flow of information within team members.

The study findings showed that procurement procedures affected successful implementation of road construction projects in the County Government of Murang'a. It was identified that the procurement methods influenced project completion time, project

scope and project budget. Procurement methods influenced project budget by ensuring that all project activities are considered in determining project completion time.

Procurement methods in the county influenced project scope by ensuring fact funding was done before planning a project's scope and by increasing the chances of covering all project activities

Procurement methods in the county influenced project budget by increasing chances of accurate funds allocation to a project and by ensuring bids and previous work is considered in project budgetary. Procurement methods affected accountability by ensuring that all project transactions and activities were open to all stakeholders and by ensuring that all projects are completed within schedule. It was noted that the compliance with public procurement act 2005 in the County influenced project completion time, by increasing chances of project completion within schedule and by ensuring that individual responsibility of delayed projects.

The study found out that financial resources allocation affected successful implementation of road construction projects in the County Government of Murang'a. The study noted that road funds allocation in the County influenced project completion time by increasing chances of project completion within schedule and by enhancing implementation of a project in planned phases and item costs of a project and by ensuring availability of funds within the project schedule. Road funds allocation in the County influenced affected project scope by ensuring that all activities of a project are implemented and by increasing chances that the scope of a project will be covered and mostly reduces the risk of project failure.

Road funds allocation in the County influenced project budget by ensuring that the budget includes all costs for various project activities and items, increases chances of accurate estimates for budgetary allocations and enhances project budgets for future similar projects. It was also noted that contractor's payment influenced project completion time by increasing the chances that a project will be completed in time, ensuring payments are made on time and completion of projects are within time and by increasing chances of project implementation within schedule.

The study noted that contractor's payment influenced project budget by increasing chances of accurate project budget by ensuring a project budget includes all contractor payments and determining the total cost of implementing a project. Financial management practices in the County affected project completion time by increasing chances of proper appropriation of funds in a project within the scheduled time, ensuring all finances are utilized as planned during implementation of a project and increasing chances of completing a project within the scheduled time.

The study noted that project monitoring and controlling determined successful implementation of road construction projects in the County Government of Murang'a. The study noted that project scope control in the County affected project completion time by ensuring that all project activities were implemented within scheduled time and by enhancing prioritization of project activities. The findings thus indicates that project scope control in the County affected project completion time by ensuring all project activities are implemented within scheduled time, ensuring that all project activities are progressively checked within the scheduled time and by reducing the risk of realizing project delay when it's too late. The study noted that project scope control in the County

affected project scope by ensuring that all activities in a project are implemented, enhancing prioritization of project activities and by ensuring that all projects are successfully implemented. The study revealed that project scope control in the County affected project budget by ensuring that there is continual update of the project budget as implementation continues, ensuring that the budget captures actual costs of the project activities and ensuring cost effective decision making during project implementation.

It was noted that project cost control in the County affected project completion time by ensuring successful completion of projects within time, reducing chances of project delay and by enhancing timeliness of project delivery. The findings thus further indicated that project cost control in the County affected project scope by ensuring project scope was within acceptable, increasing project efficiency and it was also noted that project cost control in the County affected project budget by ensuring all necessary cost estimates are included in the project budget, increasing chances that the project budget is adhered and by reducing the risk of either over or under costing of projects.

The study identified that project schedule control in the County affected project completion time by increasing chances that the project will be completed in time, ensuring that all project activities are completed within time and reducing the risk of project delay. Project schedule control in the County affected project scope by ensuring that all activities are included in the project scope, increasing chances of successful project. The study findings further thus indicated that project schedule control in the County affected budget by increasing effective dispensing of budgetary allocations to the

project activities, ensuring a project was implemented within the budget estimates and by increasing chances of project completion within budget.

The study revealed that government policy had a moderating effect on successful implementation of road construction projects in the County Government of Murang'a.

The study noted that public works policies affected project completion time by ensuring that projects are completed within schedule, reducing risk of project delay and insisting on continuous monitoring of project progress to ensure timely completion.

The study noted that public works policies in the County affected project scope by ensuring all project activities are included in the scope, increasing chances of comprehensively implemented projects and by reducing chances of project failure. The study findings thus indicated that public works policies in the County affected project budget by ensuring that all project costs are included in the project budget, ensuring that there is no over or under costing in the project budget and by reducing the risk of project's funds misappropriation.

The study findings indicated that road construction regulations in the County affected project completion time by ensuring all aspects of a project are assessed and included in the project scope, reducing the risk of implementing poor roads and ensuring that all projects are implemented within the law. Findings from the study indicated that road construction regulations in the County affected project budget by ensuring cost effective roads are constructed, ensuring roads are implemented within budget and by ensuring that all funds allocated to roads are utilized as budgeted. The study findings indicated that county government policies in the County affected project completion time by ensuring alignment of projects to county schedule of implementation, ensuring alignment of

National and county completion time of projects and reducing the risk of delay in completion of projects. The study noted that that county government policies in the County affected project scope by ensuring all activities identified are within the project's scope, increasing the chance of quality implemented projects and by increasing the chance of implementing sustainable projects. The study findings finally showed that county government policies in the County affected project budget by ensuring projects are within the county budget, ensuring implementation of cost effective projects and by ensuring effective and efficient budgeting of projects.

Conclusions of the Study

The study findings concluded that financial resources is the major factor that determines most successful implementation of road construction projects with a coefficient of 0.554, the followed by managerial skills with a coefficient of 0.171, then project monitoring and controlling with a coefficient of 0.143 and lastly procurement procedures with a coefficient of 0.117.

The study drew conclusion that managerial skills are determined by ability of the project managers to apply leadership skills, team work skills, communication skills. Lack of managers with project management skills makes it difficult for the project managers to develop and implement effective project implementation strategies that lead to management of project implementation challenges and successful implementation of road construction projects.

Poor execution of procurement procedures leads to award of tenders to unqualified contractors who lacks human resource capacity in implementation of road construction projects. This leads to construction of poor quality roads and delay in implementation of road construction projects. Procurement procedures are determined by procurement methods, accountability and level of compliance with public procurement act 2005.

Poor financial management methods affects organizing and managing project resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints. The effect of financial resources on successful project implementations is determined by road funds allocation, contractor's payment and financial management practices.

Lack of effective project monitoring and controlling methods affects delivering of projects within the defined constraints and this affects successful implementation of road construction projects. The most important aspects of project monitoring and control in road construction projects include; project scope control; project cost control and project schedule control.

Government policies play a crucial role in determining how road construction projects are successfully completed in the country. The enactment of the new constitution has led to change of government policies on matters of allocation of road construction funds where counties have been given some mandate to oversee implementation of certain road construction projects. This has increased confusion between the county administration and the ministry of roads hence leading to delay or lack of implementation of various

road construction projects.

Recommendations of the Study

The study suggested the following recommendations as a measure to improve on implementation of road construction projects. To improve on managerial skills and enhance successful implementation of road construction projects in the County Government of Muranga. The county government should recruit professionally trained and competent project management staff. The project implementation staff should be continuously trained on new and emerging practices in project management. Project managers should be trained on leadership skills, team work skills, communication skills. Lack of managers with project management skills makes it difficult for the project managers to develop and implement effective project implementation strategies that lead to management of project implementation challenges and successful implementation of road construction projects.

The management of the county government should follow procurement methods in accordance with all the public procurement regulations especially during selection of contractors. Road construction tenders should be awarded to qualified contractors with capacity and experience in implementation of road construction projects. The county government should allocate enough financial resources for road construction projects. Contractor should be paid in time and effective financial management practices should be employed. Effective project monitoring and controlling methods should be employed and the government should enforce and ensure that all regulations that guide in road constructions are implemented.

Suggestion For Further Studies

The study examined the determinants of successful implementation of road construction projects in the County Government of Muranga. The study therefore suggests further studies to be carried out in other county governments in order to examine determinants of successful implementation of road construction projects in those counties.

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APPENDIX I: QUESTIONNAIRE

Dear respondent. The research is for academic purpose only and will be treated with outmost confidentiality. This questionnaire seeks to gather information on determinants of successful implementation of road construction projects in the County Government of Muranga. Kindly spare your fifteen minutes to respond to this questions. *(This questionnaire has been provided as a word document that can be filled out in soft copy and returned via e-mail; or printed, filled out and mailed).*

SECTION 1: GENERAL INFORMATION

1.1 What is your highest academic qualification

Diploma University Degree Post Graduate PHD

1.2 Gender:

Male Female

1.3 Please indicate your age bracket.

20-30 years 31-40 years 41-50 years over 50 years

1.4 Please indicate the number of years you have been involved in implementation of road construction projects.

2-4 years 5-7 years 6-8 years over 9 years

SECTION 2: MANAGERIAL SKILLS

2.1 How do leadership skills of your workforce influence project completion time?

- a. Increases number of roads completed on time
- b. Reduces delay of road implementation
- c. Enhances quality and quantity operations of road implementation objectives within time
- d. They enhance timely decision making and problem solving during road implementation phase

2.2 How do leadership skills of your workforce influence project scope?

- a. Increases number of roads completed within scope []
- b. Enhances quality and quantity operations of activities to meet project objectives []
- c. They enhance decision making and problem solving during project implementation phase []

2.3 How do leadership skills of your workforce influence utilization of projects budget?

- a. Ensures there is equity in budget allocation to the projects []
- b. Ensures fast decision making in allocation of funds to the projects []
- c. Ensures prioritization in funds allocation to the projects []
- d. Ensures involvement of all stakeholders in funds allocation to the projects []

2.4 How do team work skills of your workforce influence project completion time?

- a. Ensures team participation in implementation of projects within time []
- b. Increases number of successfully implemented projects within time []
- c. Reduces risk of project delay []

2.5 How do team work skills of your workforce influence project scope?

- a. Ensures all project activities are implemented []
- b. Ensures team participation in project scope planning []
- c. Increases team productivity in implementation of road construction projects []

2.6 How do team work skills of your workforce influence project budget?

- a. Ensures team participation in funds allocation to the projects []
- b. Ensures prioritization of funds allocation to the project's activities []
- c. Reduces risks of funds misappropriation to the project's activities []

2.7 How do communication skills of your workforce influence project completion time?

- a. Enhances effective communication within various stakeholders []
- b. Ensures project completion time is communicated during project planning []
- c. Ensures continuous flow of information within project team []
- d. Reduces risks of project delay []

2.8 How do communication skills of your workforce influence project scope?

- a. Ensures all project activities are communicated []
- b. Ensures continuous flow of information within team members []
- c. Ensure communication of changes in a project's scope []

2.9 How do communication skills of your workforce influence project budget?

- a. Ensures all information about a project is gathered for funds allocation []
- b. Ensures stakeholder participation in project budgetary []
- c. Enhances flow of information within team members []

SECTION 3: PROCUREMENT PROCEDURES

3.1 How does procurement methods in the County influence project completion time?

- a. Ensures projects commence on time
- b. Ensures all stakeholders are involved in project planning
- c. Ensures all project activities are considered in determining project completion time

3.2 How does procurement methods in the County influence project scope?

- a. Ensures fact finding is done before planning a project's scope
- b. Increases chances of covering all project activities
- c. Reduces the risk of having delayed projects due to faults on the scope

3.3 How does procurement methods in the County influence project budget?

- a. Increases chances of accurate funds allocation to a project
- b. Ensures market forces of demand and supply are considered in project budgetary
- c. Ensures bids and previous work is considered in project budgetary

3.4 How does accountability in the County influence project completion time?

- a. Ensures all project transactions and activities are open to all stakeholders
- b. Ensures penalties for delayed implementation of projects
- c. Ensures all projects are completed within schedule

3.5 How does accountability in the County influence project scope?

- a. Ensures feasibility studies of all projects to be implemented are done
[]
- b. Increases chances of covering all activities of a project []
- c. Ensures individual responsibility of team members working on a particular project []

3.6 How does accountability in the County influence project budget?

- a. Ensures audit of all implemented projects []
- b. Ensures itemized approach in a project's budget []
- c. Ensures individual responsibility of a project's budget []
- d. Reduces risks of over costing on various project activities and items []

3.7 How does compliance with public procurement act 2005 in the County influence project completion time?

- a. Increases chances of project completion within schedule []
- b. Ensures road projects adhere to planned schedule []
- c. Ensures individual responsibility of delayed projects []

3.8 How does compliance with public procurement act 2005 in the County influence project scope?

- a. Increases effective fact finding in planning the scope of a project []
- b. Ensures all activities are included in a project's scope []
- c. Enhances individual responsibility of implemented road projects []

3.9 How does compliance with public procurement act 2005 in the County influence project budget?

- a. Ensures prioritization in funds allocation to a project []
- b. Increases individual responsibility of activity and item costs of a project []
- c. Reduces the risk of over budgeting of activities and items in a project []

SECTION 4: FINANCIAL RESOURCES ALLOCATION

4.1 How do road funds allocation in the County influence project completion time?

- a. Increases chances of project completion within schedule []
- b. Enhances implementation of a project in planned phases []
- c. Ensures availability of funds within the project schedule []

4.2 How does road funds allocation in the County influence project scope?

- a. Ensures all activities of a project are implemented []
- b. Increases chances that the scope of a project will be covered []
- c. Reduces the risk of project failure []

4.3 How does road funds allocation in the County influence project budget?

- a. Ensures the budget includes all costs for various project activities and items []
- b. Increases chances of accurate estimates for budgetary allocations []
- c. Enhances project budgets for future similar projects []

4.4 How does contractor's payment in the County influence project completion time?

- a. Increases the chances that a project will be completed in time
- b. Ensures payments are made on time and completion of projects are within time
- c. Increases chances of project implementation within schedule

4.5 How does contractor's payment in the County affect project scope?

- a. Ensures projects are implemented within scope
- b. Increases chances of covering all activities in a project
- c. Enhances productivity in project implementation

4.6 How does contractor's payment in the County affect project budget?

- a. Increases chances of accurate project budget
- b. Ensures a project budget includes all contractor payments
- c. Determines the total cost of implementing a project

4.7 How do financial management practices in the County affect project completion time?

- a. Increases chances of proper appropriation of funds in a project within the scheduled time
- b. Ensures all finances are utilized as planned during implementation of a project
- c. Increases chances of completing a project within the scheduled time

4.8 How do financial management practices in the County affect project scope?

- a. Increases chances that all costs in a project are included in the scope []
- b. Ensures dispensing finances to a project's activities is done in a timely manner []
- c. Ensures all financial liabilities of a project are included in the project's scope []

4.9 How do financial management practices in the County affect project budget?

- a. Increases efficiency of budget allocations []
- b. Ensures project budgets are within acceptable standards []
- c. Ensures project budget estimates are utilized as allocated in the project budget []

SECTION 5: PROJECT MONITORING AND CONTROL

5.1 How does project scope control in the County affect project completion time?

- a. Ensures all project activities are implemented within scheduled time []
- b. Ensures all project activities are progressively checked within the scheduled time []
- c. Reduces the risk of realizing project delay when it's too late []

5.2 How does project scope control in the County affect project scope?

- a. Ensures all activities in a project are implemented []
- b. Enhances prioritization of project activities []
- c. Ensures projects are successfully implemented []

5.3 How does project scope control in the County affect project budget?

- a. Ensures there is continual update of the project budget as implementation continues []
- b. Ensures the budget captures actual costs of the project activities []
- c. Ensures cost effective decision making during project implementation []

5.4 How does project cost control in the County affect project completion time?

- a. Ensures successful completion of projects within time []
- b. Reduces chances of project delay []
- c. Enhances timeliness of project delivery []

5.5 How does project cost control in the County affect project scope?

- a. Ensures project scope is within acceptable cost []
- b. Increases project efficiency []
- c. Enhances project activities []

5.6 How does project cost control in the County affect project budget?

- a. Ensures all necessary cost estimates are included in the project budget []
- b. Increases chances that the project budget is adhered []
- c. Reduces the risk of either over or under costing of projects []

5.7 How does project schedule control in the County affect project completion time?

- a. Increases chances that the project will be completed in time []
- b. Ensures that all project activities are completed within time []
- c. Reduces the risk of project delay []

5.8 How does project schedule control in the County affect project scope?

- a. Ensures all activities are included in the project scope []
- b. Increases chances of successful project implementation []
- c. Ensures timely delivery of project activities []

5.9 How does project schedule control in the County affect project budget?

- a. Increases effective dispensing of budgetary allocations to the project activities []
- b. Ensures a project is implemented within the budget estimates []
- c. Increases chances of project completion within budget []

SECTION 6: GOVERNMENT POLICY

6.1 How do public works policies affect project completion time?

- a. Ensures projects are completed within schedule []
- b. Reduces risk of project delay []
- c. Insists on continuous monitoring of project progress to ensure timely completion []

6.2 How do public works policies affect project scope?

- a. Ensures all project activities are included in the scope []
- b. Increases chances of comprehensively implemented projects []
- c. Reduces chances of project failure []

6.3 How do public works policies affect project budget?

- a. Ensures all project costs are included in the project budget []
- b. Ensures there is no over or under costing in the project budget []
- c. Reduces the risk of project's funds misappropriation []

6.4 How do road construction regulations affect project completion time?

- a. Ensures timely completion of projects []
- b. Ensures individual responsibility in project implementation []
- c. Increases the chance that projects are completed within schedule []

6.5 How do road construction regulations affect project scope?

- a. Ensures all aspects of a project are assessed and included in the project scope []
- b. Reduces the risk of implementing poor roads []
- c. Ensures projects are implemented within the law []

6.6 How do road construction regulations affect project budget?

- a. Ensures cost effective roads are constructed []
- b. Ensures roads are implemented within budget []
- c. Ensures funds allocated to roads are utilized as budgeted []

6.7 How do county government policies affect project completion time?

- a. Ensures alignment of projects to county schedule of implementation []
- b. Ensures alignment of National and county completion time of projects []
- c. Reduces the risk of delay in completion of projects []

6.8 How do county government policies affect project scope?

- a. Ensures all activities identified are within the project's scope []
- b. Increases the chance of quality implemented projects []
- c. Increases the chance of implementing sustainable projects []

6.9 How do county government policies affect project budget []

- a. Ensures projects are within the county budget []
- b. Ensures implementation of cost effective projects []
- c. Ensures effective and efficient budgeting of projects []

**SECTION 7: IMPLEMENTATION OF ROAD CONSTRUCTION PROJECTS
(TICK WHERE APPROPRIATE)**

7.1 What is the number of completed projects within time in the last five years in the County?

Projects	Years				
	2011	2012	2013	2014	2015
1 to 3					
4 to 6					
7 to 10					
11 to 13					
14 to 17					
Over 17					

7.2 What is the number of implemented projects within scope in the last five years in the County?

Projects	Years				
	2011	2012	2013	2014	2015
1 to 3					
4 to 6					
7 to 10					
11 to 13					
14 to 17					
Over 17					

7.3 What is the number of projects implemented within budget in the last five years in the County?

Projects	Years				
	2011	2012	2013	2014	2015
1 to 3					
4 to 6					
7 to 10					
11 to 13					
14 to 17					
Over 17					