
**INFLUENCE OF PROJECT PLANNING PRACTICES ON PERFORMANCE OF
KeRRA ROAD CONSTRUCTION PROJECTS IN MERU COUNTY, KENYA**

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ABSTRACT

The success of road construction projects is essential to the expansion and development of any economy. In terms of generating cash and jobs, road construction projects are significant for the economy. The goal of the study was to evaluate how project planning procedures affected the effectiveness of road construction projects in Meru County. The study's goals were to determine the effects of project communication planning on the performance of road construction projects in Meru County, to establish the effects of schedule planning on the performance of road construction projects in Meru County, and to determine the effects of project scope planning on the performance of road construction projects. The study employed descriptive research design and target 203 road construction officials in Meru County. A sample size of 133 respondents was used through proportionate simple random sampling. The tools of data collection for this study were a questionnaire and interview schedule where primary data was collected. The researcher conducted a pilot study to test for validity and reliability of the research instruments. Descriptive statistics and inferential analysis were used in the analysis with the help of the statistical package for social sciences (SPSS). The study found that there is a significant effect of project resource, schedule, communication and scope planning on the performance of KeRRA road construction projects in Meru County. The activities in the projects are arranged in order of what needs to be undertaken first for a smooth project undertaking and the specific activities are all defined. The study recommends that the total and individual expenses of the various project work packages should be monitored. Time schedules should be created using the previously generated work breakdown structure. The most convenient and effective mode of communication should be matched between the two environments and within each of the environments. The project scope should be utilized to estimate the project's cost, and the work breakdown structure should be linked to the project plan.

Keywords: *Project Planning, Resource, Schedule, Communication, Scope, Performance, Road Construction projects*

INTRODUCTION

Roads are an essential component of the transport infrastructure that supports humanity. They serve as vital connections between target audiences, factories, and distribution centers. They promote economic prosperity by the job prospects, as well as socioeconomic, health, and educational opportunities, all of which are beneficial in the battle against poverty. The accomplishment of road construction projects is essential to the expansion and improvement of any economy. They continue to be essential to the economy in terms of generating income and creating jobs. According to the World Bank (2016), transportation connectivity is a key factor in achieving balanced and inclusive growth in developing countries.

According to Viswanathan, Tripathi, and Jha (2020), the capacity to successfully complete road construction projects has become critical to government and commercial success. However, delays in road building are one of the many expensive, frequent, hazardous, and complicated issues that arise in the completion of road projects. The three restrictions apply to any road building project: time, money, and quality. Experiencing delays during road construction projects is frequent. Delays aren't usually the product of a single calamity. Delays may cost a company a lot of money. Irrespective of the magnitude or density of the project, it must have a detailed project plan (Yap, Chow & Shavarebi, 2019).

Project planning sets a reference for the implementation of activities by establishing a blueprint that directs the project team. Projects typically cover several different areas of operation, include numerous internal and external actors, and have multiple objectives. Since the 1980s, numerous practitioners and academics have acknowledged that the most crucial factors in organizational success are practices for human resource management (HRM), time management, resources utilization planning, and financial planning (Dvir, Raz, & Shenhar, 2003). The HRMPs are being updated in businesses today as they continue to expand on their strategic function. According to Wang and Li (2020), the most prevalent factors to project failures are contractor non-payment or late payments, which typically result in low-quality projects as a result of short cuts taken by contractors as a cost-cutting measure. As a result, it is vital for lending agencies to play a crucial role in tracking expenses to guarantee value for money as part of the planning process. Project planning is critical to the success of road building programs because it aims to reduce project costs by ensuring that allocated services are used to their full potential. It eliminates irrationality, duplication of effort, and departmental tensions. It also inspires building management to be innovative and creative.

According to Wu, Yang, and Zhou (2019), Chinese construction companies used careful planning and management procedures, proper cooperation between planners and contractors, and technological and skilled skills to finish projects on time and under budget. The importance of management engagement, adequate intelligence and communication networks, and professional personnel in the execution of successful infrastructure projects cannot be overstated. Construction delays, quality problems, and cost overruns are common obstacles in the UAE construction sector, according to Johnson and Babu (2020), with 50 percent of all projects finished ahead of budget. They discovered that such delays had a negative impact on project efficiency, safety, timeliness, and expense. The impact of this problem is significant, given the construction industry's contribution to the UAE's economy, which is anticipated to be 14 percent of GDP. Despite the building industry's importance to the UAE's economy, the

researchers discovered that its inefficiencies were highly costly and hampered industrial growth and development.

In Tanzania, Ndunguru, Niyonyungu and Yang (2020) on the quantification of the influence of factors causing time and cost overruns in Tanzanian construction projects discovered that delays and disturbances in construction projects were very frequent, resulting in cost and time overrun conflicts, high idle time, and negative social effects. According to Muzaale and Auriacombe, the script was the same in Uganda (2018). They discovered that much of the country's public works programs were experiencing delays despite the fact that the country's road network is in bad condition. In contrast, according to Oshungade and Kruger, South Africa seems to have made considerable strides in preventing road building delays (2017).

Road infrastructure growth was described as a core component in Kenya's Vision 2030 (GoK, 2007) for social and economic transition. According to Mbogo (2019), road building is critical to Kenya's growth, which may explain why it is one of the country's largest industries, contributing roughly 10% of the country's gross national product (GNP). The Kenya National Highways Authority (KENHA), Kenya Urban Roads Authority (KURA), and Kenya Rural Roads Authority (KeRRA) are the three national road agencies that were created by the Kenya Roads Act of 2007 and are responsible for the management, production, reconstruction, and maintenance of various types of roads. KENHA is in responsibility of the public roads in cities and municipalities that have national roads that are not protected by KURA, KeRRA is in charge of the rural roads, and KURA is in charge of the public roads in those towns and municipalities.

Statement of the Problem

As outlined in Kenya Vision 2030, successful road construction is a catalyst for economic growth (GoK, 2007). As a result, the Kenyan government has implemented a number of policies to improve the efficiency of road infrastructure projects. The Kenya Roads Act of 2007 was passed, and the Kenya National Highways Authority, Kenya Urban Roads Authority, and Kenya Rural Roads Authority were created (2007). These regulations were designed to provide a legal and administrative structure for road building, reconstruction, and repair. In addition, the government has made significant investments in road constructions. For example, in the 2016/2017 financial year, KeNHA proposed to build 13,138.72 kilometers of roads at a cost of KSh. 20,459,228,001, KeRRA on the other hand had a budget of KSh. 10,893,617,021 for maintaining 28,243 kilometers of road while KURA had planned to use Ksh.5,106,382,979 to maintain 2,338 kilometers of road (KRB, 2018).

Despite the government's continued investment in road construction, Wafula (2017) laments that about 55 percent of all road construction projects in the country face a variety of difficulties that prevent them from being completed on time, incurring cost overruns, or failing to meet the required quality requirements. According to a KPMG study from 2017, only 39.4 percent of road infrastructure projects built by local companies in Kenya were completed within the budgeted expense and timeline. Just 35% of projects conducted by local companies met the desired quality requirements, according to the survey. Over the period 2014 to 2017, Kenya only received a 36.9% average production ranking on road projects completed by local companies. According to the Kenya Urban Roads Board's (2018) survey, Kenya National Highways Authority receives nearly 30% of funds directed to the Ministry of Roads each year. However, the majority of road construction projects experience cost overruns, which result in the contract price going above what was initially anticipated.

According to a report by Gathoni and Karanja (2016), the majority of the building projects funded by the Constituency Development Funds (CDF) in the County were either poorly constructed (30%) or not completed at all (50%) and only 20% were completed and handed over. Simiyu (2018) investigated how project planning and execution affected the success of agricultural projects carried out by community-based groups in Bungoma County and discovered that both had an effect. Muute and James (2019) evaluated the project preparation procedures and building project efficiency in Nairobi City County. While analyzing the variables influencing the completion of government road infrastructure projects in Kenya: a case study of Meru County, Kithinji (2017) was unable to pinpoint the effect of project planning methods on the success of road building projects.

The studies that have been evaluated in the past have demonstrated a connection between project planning and project performance, however there is little empirical data on how project planning affects the road construction projects' success. The performance of the road building projects in Meru County has also been the subject of prior empirical investigations, although little is known about how project planning procedures affect this performance. This study sought to fill this knowledge gap by evaluating the influence of project planning practices on the performance of KeRRA road construction projects in Meru County.

Objectives of the Study

- i. To assess the influence of project resource planning on the performance of KeRRA road construction projects in Meru County.
- ii. To establish the influence of schedule planning on the performance of KeRRA road construction projects in Meru County.
- iii. To determine the influence of project communication planning on the performance of KeRRA road construction projects in Meru County.
- iv. To establish the influence of project scope planning on the performance of KeRRA road construction projects in Meru County.

Research Hypothesis

- i. **H₀**: There is no significant influence of project resource planning on the performance of KeRRA road construction projects in Meru County.
- ii. **H₀**: There is no significant influence of schedule on the performance of KeRRA road construction projects in Meru County.
- iii. **H₀**: There is no significant influence of project communication planning on the performance of KeRRA road construction projects in Meru County.
- iv. **H₀**: There is no significant influence of project scope planning on the performance of KeRRA road construction projects in Meru County.

LITERATURE REVIEW

Empirical Review

The performance of a road construction project is determined by the set timelines, its efficiency and effectiveness (Wang, Liu & Canel, 2018). Efficiency is measured by smooth operations amid team participants and how financial and time resources are managed and effectiveness is measured by the quality of work produced and whether the project's objectives are met. According to Nguyen and Watanabe (2017) the literature on project management describes

project success as meeting the timetable, operational effectiveness, objectives, and budget. Other project success metrics include client satisfaction, client improvement, market performance, environmental effects, minimal conflicts and disputes, and health and safety (Hasnain, Thaheem & Ullah, 2018).

A study in Palestine assessed the causes of delays in road building projects. In the study, Mahamid, Bruland, and Dmaid (2020) used a questionnaire survey to look into the timeliness of road construction projects in the West Bank of Palestine, in order to determine the causes of delays and the severity of those delays, as reported by contractors and consultants. The field survey comprised 34 contractors and 30 consultants in total. A total of 52 causes of delay were discovered during the research. The political situation, West Bank segmentation and restricted movement between areas, awarding project to lowest bid price, payment delay, and equipment shortage are the top five severe delay triggers, according to the survey.

In Sri Lanka, Mudiyanse (2020) examined the impact of resource planning on construction project delays. A questionnaire survey was used to poll contractors, consultants, and clients. The results of this study have been backed up by previous research on metrics like the "relative value index," which was used to rank the causes of delays. According to the findings of relative significance index values and rank values of clients' replies, contractors' responses, consultants' reactions, and overall assessment of responses, ineffective project scheduling is the most significant cause reason for construction project delays. Inadequate data collection prior to design as well as a lack of competence among supervisors and technical officers were other factors that influenced project delay.

In Wajir County, Kenya, Abdi (2020) examined resource management activities and the efficiency of road infrastructure projects. In this analysis, a descriptive survey design was used. The aim was to meet 193 project stakeholders, including 5 county officials from the County Transport and Infrastructure Department, 47 project managers, and 141 members of the project management committee, all of whom were involved in the county government's 47 major road projects. A key advantage of resource planning, according to the report, is that it aids organizations in efficiently completing task requirements.

Project schedule planning, according to Martens and Vanhoucke (2017), is the method of managing the project's timely completion. Indeed, schedule planning is a way of keeping track of and managing the amount of time spent on each task. Project scheduling, also known as time preparation, is an important aspect of the project execution process. Sanchez and Terlizzi (2017) describe schedule planning in a project as the duty of allotting enough time to the overall conduct of the project through the stages of its cycle using the procedures of time planning, time estimating, time scheduling, and schedule control (concept, growth, execution, and completion). Success in a project does not entail signing a contract and anticipating that it will be finished on schedule, within budget, and according to the project's scope. To be effective in a project, all aspects of project time/scheduling preparation must be correct.

Communication management practices in the Kenyan building industry in order to improve project controls were evaluated by Ongondo (2016). A mixed-methods approach was used, with questionnaire sample review and interviews with subject matter experts. The research identified six (6No.) problems that must be addressed with caution when handling connectivity during project execution. Level of decision-making process, change approval policy, quality &

frequency of project meetings, updating of project schedules, project vision, and progress monitoring mechanism are the issues listed in order of priority.

Theoretical Framework

Resource-Based View (RBV) theory

The Resource-Based View (RBV) theory of Barney (1991) notes that a firm is described as a collection of resources. The theory arose from strategic management research into how businesses generate value and, more importantly, how they can gain a market competitive advantage. In order to improve resource management and utilization and gain a competitive advantage, project managers should check to see if the resources they have available match the VRIN's needs. The RBV theory, according to Barney and Mackey (2016), is essential for project managers because it gives them the ability to define resource value, allocate resources in accordance with policy, and pinpoint the skills required for the business to be successful. Because project resource planning, scheduling, and management is an important part of project management, the RBV principle can be used in this study.

Theory of Constraints

The theory of constraints (TOC) is an overall management philosophy introduced by Eliyahu Goldratt in 1984. The theory of constraints basically states that a set of constraints prohibits any management system from achieving more of its objectives. Meeting all of the project's aims and objectives while adhering to its established limits is the major duty of project management. The three most frequent project restrictions are scope, time, and budget. Optimizing the allocation and integration of the inputs required to achieve predetermined objectives is the second and more difficult challenge. Every manageable structure is constrained, according to Goldratt (1990), who developed the theory of constraints. Road construction projects experience constraints such as cost, time and scope. All projects contain risks and restrictions that might make it difficult to complete a high-quality project. Perhaps the project manager may not have the necessary tools or a large enough crew. All of them are unique restrictions. After identifying the limitation, the following step is to address the problem in order to improve project performance which is contingent on the limitation.

Communication Accommodation Theory

Howard Giles (1970) enhanced this theory by elucidating how people change their behavior when interacting and chatting with others. He observed that humans either emphasize or suppress social distinctions, either verbally or through the use of signs. These prepositions by Howard are complex in describing facets of strategic communication, as it encompasses not only verbal but also nonverbal communication. The negotiation process is influenced by the characteristics of the people involved. Accommodation happens when one communicates with someone who has superior qualities, while people appear to diverge when they choose to emphasize their differences (Gallois & Giles, 2015). Communication is an essential part of road construction project management since project managers spend the majority of their time doing it to coordinate operations. They must gather a vast quantity of data and transmit it to all project teams in order to coordinate their efforts. Without this communication, there is a chance that various project participants or teams may duplicate efforts, important goals and targets will be overlooked, resources will be misallocated, and the project's scope will become larger than it was initially intended to. As a result, companies could stagnate or even shut down completely. As a

result, the theory directed the research into determining the impact of communication planning on the performance of road construction projects in Meru County.

Conceptual Framework

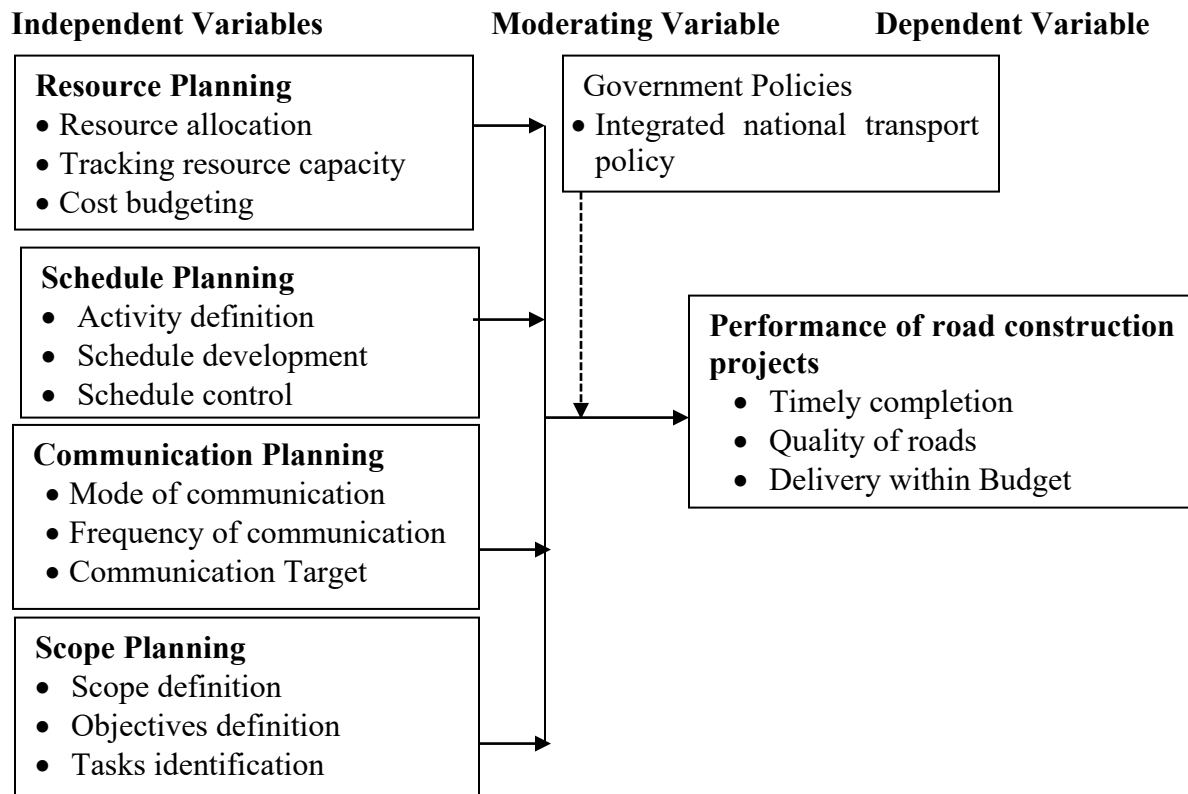


Figure 1: Conceptual framework

METHODOLOGY

The study employed a descriptive research design. Descriptive research described data and characteristics about the population or phenomena being studied. The questions who, when, where and how are answered by descriptive analysis (Atmowardoyo, 2018). The study targeted government road construction projects in Meru County. The county has nine constituencies with a total of 203 personnel involved in the road construction projects under KeRRA.

Krejcie and Morgan (1970) sampling formula was used to get the sample size as follows;

$$S = \frac{X^2 NP (1-P)}{d^2 (N-1) + X^2 P(1-P)}$$

s = required sample size.

X^2 = the table value of chi-square for 1-degree of freedom at the desired confidence level (3.841)

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

$d = \text{the degree of accuracy expressed as a proportion } (.05)$

$$S = (3.841)203(0.5)(1-0.5)/0.0025(202) + 3.841*0.5 (1-0.5)$$

$$194.93/1.465$$

$$S=133$$

The sample size was thus 133 participants. From the target population of 203 officials the study selected 133 respondents through a proportionate simple random sampling method. The two main tools used to collect primary data for this inquiry were a questionnaire and an interview schedule.

Data was analyzed through descriptive and inferential analysis. The data was coded into the SPSS for data analysis. The package generated both descriptive and inferential statistics. Descriptive statistics values such as mean, standard deviation, minimum and maximum were used. For the inferential statistics a regression analysis was used to predict the relationship between the dependent variable and the predictor variables and in testing study hypothesis.

FINDINGS

Project Resource Planning and Project Performance

Table 1: Project resource planning and performance road construction projects

	N	SD	D	N	A	SA	Mean	Std. Deviation
The project team identifies the resources required for the project and how much these the resources are needed	91	0	3	15	60	13	3.91	0.66
The allocation of the total estimate of cost to individual deliverables for the measurement of project performance is key	91	4	6	12	50	19	3.81	0.99
Resources are allocated to specific tasks according to their capacities	91	0	6	13	49	23	3.98	0.82
The capacity of the resources is tracked at any given time	91	0	4	21	53	13	3.82	0.72
We create a cost-management strategy in each project, which explains how cost variances are handled for the project to succeed	91	0	6	14	43	28	4.02	0.86
Cost budgeting is done for every resource required in the projects	91	1	1	0	47	32	4.07	0.97
Composite							3.94	0.84

The composite mean is 3.94 and the composite standard deviation is 0.84. With an average of 4.07 (std. dev= 0.97), respondents agree that budgeting is done for each resource needed in the project. The respondents agreed that resources are allocated to specific tasks according to their capacities as shown by a mean of 3.98(std. dev= 0.82). With a mean of 4.02 (std. dev= 0.86) the respondents agreed that they create a cost-management strategy in each project, which explains how cost variances are handled for the project to succeed. In addition, the respondents agreed that the project team identifies the resources required for the project and how much these

resources are needed as indicated by a mean of 3.91 (std. dev= 0.66). The respondents further agreed that the allocation of the total estimate of the cost to individual deliverables for the measurement of project performance is key as shown by a mean of 3.81 (std. dev=0.99). The participants also agreed that the capacity of the resources is tracked at any given time as depicted by a mean of 3.82 (std. dev=0.72).

The interviewees stated that effective and efficient manpower planning was critical in achieving project objectives because it ensured that the appropriate number and type of project team members were available at the appropriate time and location. They continued by saying that resource planning made sure that the proper tools and materials, as well as people who could carry out the project's tasks effectively and efficiently, were available when the projects were being carried out. The findings imply that project resource planning influences the performance of KeRRA road construction projects. The findings corroborate with Abdi's (2020) findings that the effects of resource planning on the project performance were positive and meaningful and that it aids organizations in efficiently completing task requirements and efficient resource allocation.

Project Schedule Planning and Project Performance

Table 2: Project schedule planning and performance of road construction projects

	N	SD	D	N	A	SA	Mean	Std. Deviation
Specific activities are all defined	91	2	7	2	52	28	4.07	0.92
All activities in the projects have duration estimates	91	0	0	20	52	19	3.98	0.66
The team management always tracks actual dates versus planned dates to control the schedules	91	2	19	4	42	24	3.74	1.13
Project schedules have to be well developed from the start to the end of the project	91	2	0	14	75	0	3.78	0.55
Project managers provide documentation and map tasks to be completed	91	0	1	18	55	17	3.97	0.67
Activities in the projects are arranged in order of what needs to be undertaken first for a smooth project undertaking	91	0	0	15	46	30	4.16	0.69
Composite							3.95	0.77

The composite mean was 3.95 and the standard deviation was 0.77. The results agree that the activities in the project are ordered in the order of what must be done first in order for the project to run smoothly, as indicated by the mean value of 4.16 (standard deviation = 0.69). With a mean of 4.07 (std. dev= 0.92), the respondents agreed that specific activities are all defined. The respondent's further agreed that project managers provide documentation and map tasks to be completed as illustrated by a mean of 3.97 (std. dev=0.67). A mean of 3.98 (standard deviation, 0.66) indicates that the respondents were in agreement that all activities in the projects have estimated durations. In addition, the participants agreed that the team management always tracks actual dates versus planned dates to control the schedules as depicted by a mean of 3.74 (std. dev=1.13) and that project schedules have to be well developed from the beginning to completion of the project as depicted by a mean of 3.78 (std. dev= 0.55).

From the interviews, project scheduling gives a clearer picture of how the project should be carried out, which is accomplished by embedding schedules into project activities, such as the start and finish dates for tasks and the resources required to complete them. In addition, the interviewees noted that a well-thought-out road construction schedule not only establishes the pace of the job, but also the manner in which it is completed. It also aids in the definition of the materials their use methodologies, and sequences in which the materials are used. The findings show that project schedule planning influence the performance of KeRRA road construction projects in Meru County. Similarly, Martens and Vanhoucke (2017), revealed that project schedule planning is a way of keeping track of and managing the amount of time spent on each task. From the study, the team management always tracks actual dates versus planned dates to control the schedules and the project managers provide documentation and map tasks to be completed.

Project Communication Planning and Project Performance

Table 3: Project communication planning on performance of road construction projects

	N	SD	D	N	A	SA	Mean	Std. Deviation
Key information is communicated to all stakeholders in the entire project	91	0	2	16	73	0	3.78	0.47
Information is disseminated to stakeholders frequently	91	0	3	10	71	7	3.90	0.56
Mobile phones, emails, and in-person meetings are often used in project communications	91	0	4	4	66	17	4.05	0.64
Effective communication is crucial to project success	91	0	4	4	74	9	3.96	0.56
Project communication helps in keeping up a shared understanding of what is happening	91	0	0	14	60	17	4.03	0.58
Communication across all the stakeholders and team members is critical for project activities	91	2	8	1	66	14	3.90	0.84
Composite							3.94	0.61

The respondents agreed with a mean of 4.05(std. dev=0.64) that mobile phones, emails, and in-person meetings are often used in project communications. The respondents agreed that project communication helps in keeping up a shared understanding of what is happening as indicated by a mean of 4.03 (std. dev=0.58). With a mean of 3.90 (std. dev= 0.56), the respondents agreed that information is disseminated to stakeholders frequently. The respondents also agreed that effective communication is crucial to project performance as indicated by a mean of 3.96(std. dev=0.56) and that communication across all the stakeholders and team members is critical for project activities (mean=3.90, std. dev=0.84). The respondents further agreed that key information is communicated to all stakeholders in the entire project as illustrated by a mean of 3.78 (std. dev=0.46). The average standard deviation was 0.61 and the average mean was 3.94.

The study found from the interviews that the most common types of communication methods are oral and written. At the road construction sites, face-to-face and telephone communication is used and is much more effective since it is timely. Communication between the contractor and

KeRRA is mostly written which includes emails, letters and reports which are also used due to their easy referencing. The respondents further noted that electronic communication is widely used in road construction projects where mobile devices and the internet are used. The findings reveal that project communication planning influence the performance of KeRRA road construction projects. Effective communication is crucial to project success since project communication helps in keeping up a shared understanding of what is happening. Corresponding to the findings Yap, Abdul-Rahman & Wang (2018) support that project communication entails the sharing of information to ensure that all project stakeholders are on the same page.

Project Scope Planning and Project Performance

Table 4: Project scope planning and performance of road construction projects

	N	SD	D	N	A	SA	Mean	Std. Deviation
Description of project scope assists in defining main project work elements, deliverables and specifications	91	2	4	8	77	0	3.77	0.61
Breakdown of work structure provides required guidelines for comprehensive cost estimates and control	91	0	2	19	57	13	3.89	0.63
The identification of project goals and objectives is very key in guiding the whole project	91	0	5	13	61	12	3.88	0.70
The project scope helps identification of the projects boundaries and tasks allocations	91	1	3	6	60	21	4.04	0.75
In project scope planning roles and responsibilities of the project, teams are identified and listed	91	0	6	13	48	24	4.04	0.79
Scope planning enables project managers to assign resources so that the project can be completed in time	91	0	4	21	54	12	3.79	0.73
Composite							3.90	0.70

The results indicate that the participants agreed that the project scope helps identification of the projects boundaries and tasks allocations as illustrated by a mean of 4.04 (std. Dev=0.75) and that in project scope planning roles and responsibilities of the project teams are identified and listed as indicated mean of 4.04 (std. dev=0.79). The results also show that respondents, with a mean of 3.89 (standard deviation: 0.63), agreed that the breakdown of the task organization gives essential instructions for thorough cost estimation and control. According to respondents, who rated the project's goals and objectives with a mean of 3.88 (standard deviation: 0.70), this is a crucial step in directing the entire project. The respondents also concurred that project managers can allocate resources through scope planning in order for the project to be completed on time, as shown by a mean of 3.79 (std.dev=0.73), and that project scope descriptions help project managers define the key project work elements, deliverables, and specifications, as indicated by a mean of 3.77 (std.dev=0.61). The aggregate mean was 3.90 with an aggregate standard deviation of 0.70.

The study found that a well-defined project scope ensures that a project is completed on time, on budget, and to the highest quality standards. The respondents added that they inspect the progress

of the road construction projects in line with the outlined objectives in the project scope to ensure that the contractors adhere to the stipulated standards and timelines in each of the project activities. The findings deduce that project scope planning affects KeRRA road construction projects. Similarly, Ronoh (2020) discovered a connection between project success and project scope preparation. The findings correspond to the findings by Park, Lim, and Yoo, (2019) that scope control practices are essential for the project provider from a project phase standpoint, and also important for the customer.

Project Performance

Table 5: Performance of KeRRA road construction projects

	N	SD	D	N	A	SA	Mean	Std. Deviation
Project deadlines are adhered to	91	0	6	14	43	28	4.02	0.86
The projects' quality requirements are meet	91	0	10	8	52	21	3.92	0.87
The projects are completed within the set budget	91	2	6	3	52	28	4.08	0.89
The resources meant for the projects are well utilized	91	1	0	19	52	19	3.95	0.73
The stakeholder satisfaction is a key consideration for all road construction projects in the county	91	3	11	2	43	32	3.99	1.09
The projects' objectives are met at the completion of the projects	91	2	0	14	75	0	3.79	0.52
Composite							3.96	0.83

The results show that the respondents agreed with a mean of 4.08 (std.dev=0.89) that the projects are completed within the set budget. The respondents agreed that stakeholder satisfaction is a key consideration for all projects in the county as presented by a mean of 3.99 (std.dev=1.09). The respondents further agreed that project deadlines are adhered to as depicted by a mean of 4.02 (std.dev=0.86) and that the resources for the projects are well utilized as illustrated by a mean of 3.95 (std.dev=0.73). In addition, with a mean of 3.92 (std.dev=0.87) the respondents agreed that the projects' quality requirements are met and that the objectives of the project are meet at the completion of the projects as shown by a mean of 3.78 (std.dev= 0.55). The overall mean was 3.96 (std.dev=0.83).

The respondents noted that as government representatives, they ensure that the contractors provide the required quality of roads. They also ensure that the projects are executed at the right timelines. However, they also noted that at times challenges occur when the contractors fail to adhere to the stipulated material requirements which leads to poor quality of the road being constructed. Correspondingly, project performance is deemed good, according to Gichamba and Kithinji (2019), when it meets technical criteria and satisfies stakeholders such as end users, project team members, parent organization managers, and donors or financiers.

Regression Analysis

To determine the links between project resource, schedule, communication, and scope planning and project performance, the researcher used a linear regression analysis. The p values were used in testing the study hypothesis.

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.666 ^a	.444	.418	.26080

a. Predictors: (Constant), Scope, Communication, Schedule, Resource

The percentage of variance in the dependent variable that is explained by each independent variable is expressed by the coefficient of determination. The results showed that, at a 95 percent confidence level, there was a variance of 41.8 percent in the performance of the KeRRA road construction projects due to changes in project resource, schedule, communication, and scope planning. This value of adjusted R squared was 0.418. This demonstrates that adjustments to project planning procedures could explain for 41.8% of variations in the performance of KeRRA road building projects. According to the results, there was a substantial association between the research variables, as indicated by the correlation coefficient, R, which is displayed by the value of 0.666.

Table 7: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.669	4	1.167	17.163	.000 ^b
	Residual	5.849	86	.068		
	Total	10.519	90			

a. Dependent Variable: Performance

b. Predictors: (Constant), Scope, Communication, Schedule, Resource

An analysis of variance was also used in the study to determine the model's fitness. Table 7 presents the findings. The ANOVA demonstrates that at a 5% level of significance, the test for the model represented by the F computed 17.163 is statistically significant (0.000), which is less than (0.05). The overall model was significant since the calculated F was higher than the F critical value (value = 2.4778).

Table 8: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	.756	.127		5.952	.000
	Resource Planning	.516	.088	.633	5.875	.000
	Schedule Planning	.486	.100	.388	4.872	.000
	Communication Planning	.286	.049	.534	5.830	.000
	Scope Planning	.343	.108	.346	3.169	.002

a. Dependent Variable: Performance

$$Y = 0.756 + 0.516 X_1 + 0.486 X_2 + 0.286 X_3 + 0.343 X_4 + \varepsilon$$

According to the regression equation above, the performance of the KeRRA road construction projects would be 0.756 if project planning procedures were held constant at zero. A percent upsurge in resource planning results in higher KeRRA road construction projects performance by 51.6%. P value= 0.000 thus the null hypothesis that there is no significant effect of project resource planning on the performance of KeRRA road construction projects in Meru County is rejected and the alternative hypothesis is accepted. Therefore, there is a significant effect of project resource planning on the performance of KeRRA road construction projects in Meru County.

A percent upsurge in schedule planning results in higher KeRRA road construction projects performance by 48.6%. P value= 0.000 thus the null hypothesis that there is no significant effect of project schedule planning on the performance of KeRRA road construction projects in Meru County is rejected and the alternative hypothesis is accepted. Therefore, there is a significant effect of project schedule planning on the performance of KeRRA road construction projects in Meru County.

A percent upsurge in communication planning results in higher KeRRA road construction projects performance by 28.6%. P value= 0.000 thus the null hypothesis that there is no significant effect of project communication planning on the performance of KeRRA road construction projects in Meru County is rejected and the alternative hypothesis is accepted. Therefore, there is a significant effect of project communication planning on the performance of KeRRA road construction projects in Meru County.

The performance of the KeRRA road construction projects increases by 34.3 percent for every percentage increase in scope planning. Value of P = 0.002 As a result, the alternative hypothesis is accepted and the null hypothesis, that there is no substantial impact of project scope planning on the performance of KeRRA road construction projects in Meru County, is rejected. Therefore, there is a significant effect of project scope planning on the performance of KeRRA road construction projects in Meru County.

Conclusions

There is a substantial effect of project resource planning on the performance of KeRRA road construction projects in Meru County. The cost budgeting is done for every resource required in the projects and resources are allocated to specific tasks according to their capacities. The contractors create a cost-management strategy for each project, which explains how cost variances are handled for the project to succeed. The project team also identifies the resources required for the project and how much the resources are needed. There is a substantial effect of project schedule planning on the performance of KeRRA road construction projects in Meru County. The activities in the projects are arranged in order of what needs to be undertaken first for a smooth project undertaking and the specific activities are all defined. The management team always tracks actual dates versus planned dates to control the schedules.

There is a substantial effect of project communication planning on the performance of KeRRA road construction projects in Meru County. The most common types of communication methods are oral and written. At the road construction sites, face-to-face and telephone communication is used and is much more effective since it is timely. Communication between the contractor and KeRRA is mostly written which includes emails letters and reports which are also used due to their easy referencing. There is a substantial effect of project scope planning on the performance

of KeRRA road construction projects in Meru County. The project scope helps identification of the project's boundaries and tasks allocations where roles and responsibilities of the project teams are identified and listed. The scope planning enables project managers to assign resources that enable execution of the project.

Recommendations

For the best use of resources, the total and individual expenses of the various project work packages should be monitored. To ensure that the project is finished on time and under budget, this study contends that material management should be a top focus for successful road construction project planning.

This study suggests that the schedule should be created using a previously created job breakdown structure. Similarly, this study suggests using an appropriate sequence of activities to create a realistic and achievable schedule.

The road construction sector has two sets of environments; one is KeRRA which is the government agency and the other one is the construction site which is composed of the contractor and the team executing the road construction project. As such the most convenient and effective mode of commination should be matched between the two environments and within each of the environments.

The project scope should be utilized to estimate the project's cost, and the work breakdown structure should be linked to the project plan. Estimating individual activity costs based on execution conditions will aid in generating accurate overall cost estimates.

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