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Influence of Time Management on Implementation of Road Construction Projects in Kilifi County, Kenya

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ABSTRACT

Purpose: Major road construction projects across Kilifi County have experienced delays in delivery due to a majority of contractors, both local firms and government agencies, failing to adhere to agreed-upon completion dates.it is in the backdrop of these problems that influenced the researcher to establish the influence of time management on the implementation of road projects in Kilifi County. The main purpose of this study was to examine the influence of time management on the implementation's road constructions projects in Kilifi County.

Methodology: The study adopted cross sectional research design and collect data using questionnaires from 120 engineers/project managers, supervisors/inspectors and technicians/foremen from 12 organizations including five construction companies involved in urban road construction projects in Kilifi County, five service providers whose utility facilities run along road construction corridors in Kilifi County, and two state corporations charged with the management of road construction in Kenya. Data was analysed using both descriptive and inferential statistics with the help of IBM SPSS Statistics. Descriptive analysis involved the use of frequencies, percentages, mean and standard deviation in order to summarize the results of the various study variables. Inferential analysis involved the application of Pearson correlation and regression analysis to determine the nature of relationship between time management and implementation of road projects in Kilifi County.

Results: The study found out that activity sequencing positively and significantly affects road constructions projects in Kilifi County ($r = 0.688$, $P=0.000 < 0.01$). The study further determined that a unit improvement in activity sequencing would lead significantly lead to improvement in road project implementation ($\beta = 0.127$, $t = 2.037$, $P=0.044 <0.05$). It was also determined that resource estimation positively and significantly affects implementation of road constructions projects in Kilifi County ($r = 0.721$, $P = 0.002 < 0.01$). the analysis also showed that a unit improvement in resource estimation would lead to a unit improvement in road project implementation ($\beta = 0.218$, $t = 2.741$, $P = 0.005<0.05$). The study also determined that activity control significantly and positively predicts implementation of road constructions projects in Kilifi County ($r = 0.909$, $P= 0.000< 0.01$). The regression analysis showed that a unit improvement in activity control would significantly lead to an improvement in implementation of road construction projects in the county ($\beta = 0.173$, $t =3.045$, $P = 0.003<0.05$). Finally, the study found out that institutional capacity affects road projects implementation ($r = 0.558$, $P=0. .003 < 0.01$). It was

also determined that institutional capacity has moderating influence on the relationship between time management and road project implementation ($\beta = 0.185$, $t = 4.302$, $P=0.000 < 0.05$).

Unique contribution to theory, policy and practice: The study recommended that for effective time management during implementation of road construction projects, there should be stakeholder involvement as this will facilitate ideas and perspective. Stakeholder involvement in time management and planning, will better their correspondence, improve accuracy of information, increase credibility and acceptance findings and finally improve the quality road constructions projects in Kilifi County.

Keywords: *Road construction projects, time management, implementation, activity sequencing, resource estimation, activity control and institutional capacity*.

1.0 INTRODUCTION

Projects are investments by individuals, organizations, and governments that create new valuable assets to be used for both the public good and private benefit (Winch, 2012). According to Fewings (2005), a project encompasses different actions, with definite points to start and finish, undertaken by an organization or an individual to achieve specific goals within time schedule, quality and defined cost. Most construction projects, as noted by the World Bank (2014), often experience delays in achieving completion deadlines and exceed the initially outlined contract amounts. At times, such overruns lead to the abandonment of projects and considerable losses to the stakeholders. Conceptually, construction projects ought to run without disruptions, mainly due to delays. According to Oyewobi and Ogunsemi (2010), project managers are charged with the responsibility of establishing mechanisms to discourage laxity within the project team that may result in delays or stalling of a construction project.

However, construction projects, including roads and other infrastructures across both developing and developed countries, which are faced with a similar major challenge of delays in delivery within a planned schedule (Chism & Armstrong, 2010). Nyamwaro (2011) opines that despite the desire of every investor to have assurances on the project time and cost, to avoid challenges and the effects of delays, various factors affect the delivery of construction markets. For instance, Chism and Armstrong (2010) posit that project owners in the USA eliminate or scale down capital construction projects mainly due to uncertainty over costs, lack of financing, and concerns over delays that may significantly impact the road projects' feasibility. Similarly, conflicts exist within the UK construction industry between the projects' objectives concerning the time, cost, and quality appropriateness, according to a study by Fapohunda and Stephenson (2010). The study identified the essence of project managers possessing, among other skills, project time management skills that enable them to provide an effective project schedule and ensure the actual delivery is within the timeline.

In Kenya, the building and construction industry has experienced significant growth, mainly due to foreign investors' keenness to own a stake in the Kenyan sector since the country is considered a gateway to other markets in East and Central Africa (Kenya National Bureau of Statistics, 2012). Consequently, various significant cities, including Nairobi, Mombasa, Kisumu, Nakuru, and their environs, continue to experience booming construction projects, especially major infrastructural

projects like roads and railway. The projects are mainly sanctioned by the national or county government, institutions, or private companies and individuals.

Locally, about 93% of all passengers and cargo in the country are transported through roads but only 63,575KM out of 177, 800KM of road network are classified, in addition only 70% (44,100KM) of the classified roads are in good condition. In Kenya, roads management falls under the Ministry of Roads, through County government department of infrastructure and transport, Kenya Rural Roads Authority, Kenya Wildlife Services and Kenya National Highway Authority (Maina, 2013). Kenyan road construction sector has been characterized with numerous challenges including abortive works, demolition of business and residential houses and completion delays hence causing cost overruns. For instance, the completion date for Thika Superhighway cost escalated from 26.44 billion to 34.45 billion due to a delay of more than 2 years (World Bank, 2014).

According to Mbogo (2011), infrastructure projects like roads in Kenya are essential for the achievement of developmental and societal goals, with the construction industry contributing about 6.1 % of the gross national product. Additionally, he observes that a complex nature characterizes the construction industry since it encompasses various parties, including clients, shareholders, regulators, consultants, and contractors. As such, construction projects in Kenya are also affected by delays in delivery (The World Bank, 2014). Some of the significant citations for the delay included terrible weather conditions due to the El-Nino rains of 2011-2012, lack of community involvement, political instability due to differences in the coalition government, economic fluctuations, and inferior technology used by local subcontractors.

In Kilifi County, the majority of road contractors have shown interest in the sector, but 90% of the contractors in the sector are Small-Scale contractors (Ministry of Planning, 2010). A significant characteristic of construction companies in Kilifi County is that they privately owned enterprises with low financial and capital capability, besides lacking essential managerial skills to effectively address various challenges they have to encounter continually, especially in a developing country like Kenya (Chilipunde, 2010). As a result, major construction projects, including roads and bridges, are stalled for a long time with significant losses to all stakeholders. According to Waihenya (2011), the Kenyan coast, particularly Kilifi County, has experienced delays in the implementation of construction projects such as roads, bridges, sewage, electricity, and water projects since the infiltration by the Arabs and the Portuguese. The coastal region has been dependent on developmental ideas of their masters, lives in comfort zones, and lacks public and political support for developmental projects. Waihenya (2011) observes that construction projects across the coastal region, particularly Kilifi County, experience challenges related to lack of laborers, outdated technology, limited financial resources, and lack of political support.

In their writing, Memon et al. (2015) stipulates that to eliminate challenges associated with time overruns and delays projects completion in the global construction industry, time management is significant and essential. Time overruns entail the slow progress of construction projects that result in unmet planned schedules and significant impacts on all parties involved in the road project. Delays in the achievement of completion dates affect the profit margins of contractors who have to incur more expenses on labor and plant management, besides losing opportunities to embark on new projects (Memon, *et, al*., 2015). Therefore, effective time management skills are essential and

critical for the successful implementation and completion of road construction projects within the projected schedule.

1.1 Statement of the problem

Major construction projects across Kilifi County have experienced delays in delivery due to a majority of contractors, both local firms and government agencies, failing to adhere to agreed-upon completion dates. Although various factors contribute to the poor performance of contractors to deliver projects on time, including lack of political will, poor management of financial resources, and lack of modern technology, lack of time management skills play a critical role in delaying completion of projects (Chilipunde, 2010). Infrastructure contractors fail to complete projects within schedule due to, among other reasons, lack of time management skills, mismanagement of financial resources, and political interference. Additionally, construction projects become more expensive and experience delays in delivery due to low levels of technology used by local contractors. Wambugu (2013) posits that reasons such as non-availability of materials, amendments in project design, awaiting approval of drawings and Bill of Quantity, delays in receiving ordered material, as well as variations in orders lead to delays in the completion and implementation of road construction projects, particularly within schedule. According to Memon, *et al*. (2015), time control is of the essence for project managers for efficient construction projects' performance since it eliminates risk factors that may lead to schedule delays. There are various time management techniques and software that project managers employ to enhance time control through planning and scheduling multiple activities at different phases of the project construction process. The time management techniques provide project managers and clients with a list of dates that certain aspects of the project will be completed.

Timely completion of urban roads construction projects especially in Kilifi County such as Malindi Township roads to Bitumen delayed by 9 months, Mavueni-Kaloleni-Mariakani road dragged for more than seven years, Bachuma Gate-Maji ya Chumvi which is a section of Mombasa road, was constructed at a slow rate, 3 KM road between Kisumu Ndogo-HGM-Ngala stalled after upgrading 0.9 KM and finally, Eden Rock construction stopped after 70% of the work was done. The delays in the construction of various roads in the county has caused protest among residents and transporters (Kanda, Muchelule & Mamadi, 2016)

Despite the availability of different time management techniques to be employed to eliminate delays in the implementation and completion of road construction projects, there is limited information regarding the impact of time management on construction projects. In the past, numerous studies have focused on the causes of delays in project delivery, time management techniques, among others. For instance, a survey by Musa (2012) focused on the effects of total quality management on the performance of construction companies in Kenya, whereby he found that human resource management and resource management significantly impact contractors' performance. On the other hand, Bundi (2011) researched the challenges of managing procurement services within the construction industry in Kenya, whose findings identified inadequate allocation of financial resources and political interferences as the major hindrances to completion of projects within schedule. Similarly, a study by Nyamwaro (2011) that focused on challenges facing the implementation of construction projects indicated poor communication and a lack of knowledge in modern technology as significant hindrances. Despite a large number of studies focusing on the

construction industry in Kenya, particularly the causes of delays in the completion of construction projects, no study has been focused on the effects of time management on construction projects in Kenya. Thus, this research aims at bridging the knowledge gap by evaluating the impact of applying time management skills on construction projects, with a focus on selected projects within Kilifi County.

1.2 Purpose of the study

The main purpose of this study was to examine the influence of time management on the implementation's road constructions projects in Kilifi County. The following specific objectives guided the study:

i. To assess the extent to which activity sequencing influence the implementation of road construction projects in Kilifi County.
ii. To determine how resource estimation, influence the implementation of road construction projects in Kilifi County.
iii. To establish the extent to which activity control influence the implementation of road construction projects in Kilifi County.
iv. To examine the moderating effect of institutional capacity on the influence of time management on the implementation's road constructions projects in Kilifi County.

1.3 Research Hypothesis

The study aimed at answering the following research questions:

H_{01}: Activity sequencing does not significantly influence the implementation of road construction projects in Kilifi County

H_{02}: Resource estimation does not significantly influence the implementation of road construction projects in Kilifi County.

H_{03}: Activity control does not significantly influence the implementation of road construction projects in Kilifi County.

H_{04}: Institutional capacity does not significantly moderate the influence of time management on the implementation of road construction projects in Kilifi County.

2.0 LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Goal Setting Theory

This theory was formulated by Locke and Latham (1990). The theory of goal setting in project management is used to create goals that are specific, measurable, accurate, realistic, and timely. The model asserts that projects have varying goals that require the support of project owners, project managers, and team members. According to (Locke & Latham, 1990) the goal setting theory examines the notion of people that is driven by objectives to reach a certain state using unique strategies. The efficiency of a goal is determined by proximity, specificity, and difficulty. In any given situation, a goal acts as a reflection of the time between the personality of a person

or project and the end means. A project with specific goals leads to excellent performance, which is characterized by feedback and progressive approaches.

In a road construction projects, goals are set by the project manager and client. Road construction manager ensures that all difficulties have been addressed after the client has specified projects values and goals. The specificity nature of road projects goals is essential in the conflict resolution and decision-making process. For the project satisfaction to be achieved project goals must be integrated with the project stakeholders (Locke & Latham, 1990). According to Locke and Latham (1990) goals lead to increased commitment with an effective rationale. In the case of construction projects, goals are influenced by the abilities, experiences, success, and knowledge of the different project activities. The application of the goal setting theory will be significant because it will give a vivid picture of how time management affects the success of construction projects. The model is relevant to the study as it examines the importance of timely goals in a construction project. The theory will also be significant in identifying the need to effective time management techniques on construction projects.

2.1.2 The Bucket of Rocks Theory

Bucket of rocks theory also known as the pickle jar theory was originated by Simon Willson in 2002. The theory offers insights on how time should be managed in project management depending on the level of importance of each activity. The theory depicts that a person puts big rocks in a bucket and then adds pebbles, sand, and water. The adding of pebbles, sand, and water symbolizes it is essential to give priority to important matter first. The theory provides a visual expression, which is used to determine more important and less important things in a project. In a construction project, there is a need to group different activities based on their importance and urgency. For instance, in the bucket, the big rocks are placed at the bottom to create space for pebbles, sand, and water. In the case of a construction project, project owners and project managers need to evaluate their commitments towards achieving success within the provided timelines. The Bucket of Rocks Theory is ideal to this study as it explains the need to make effective division of activities through scheduling and listing. It can also guide project managers in the sequencing of project activities for early completion of the project.

2.1.3 Theory of Constraints

Theory of constraints was formulated by Goldratt and Cox (1984) but was later advanced by Boyd and Gupta (2004), it acts as the unifying theory in the field of operations management. It views organizations and processes as a management paradigm that is limited in goal achievement by a number of constraints. The theory uses a focusing process in the identification of constraints to restructure processes and organization around it. It is based on the assumption that processes are vulnerable because the weakest part or person can always break or damage it's at least adversely affect the outcome. Ceniga and Sukalova (2014), identified the following as the weakness of this theory: practical application, frequent absence and changes of control related to priority, lack of customer engagement, high level of organizational structure and large numbers of relevant inventories. Gupta and Boyd (2018) criticized the theory on the ground of its sub-optimality and its inferior to competing approach.

This theory can be applied in this way by identifying external and internal factors that pose a serious challenge hampering road construction implementation. It can help project managers to quickly identify and respond to these challenges adequately and make the correct plan. Critical chain project management in road constructions projects through theory of constraints can result in improved communication between project stakeholders, timeliness of road construction order and standardization activities related to road construction.

2.2 Empirical Literature Review and Research Gaps

The table 1 outlines a summary of empirical literature review and research gap.

Table 1: Summary of Empirical Literature Review and Research Gap

Authors(year)	Title of the study	Findings	Knowledge Gaps
Mandala (2015)	Studied the relationship between performance of road construction projects and stakeholder involvement in Bondo, Sub-county in Siaya County.	The study determined that stakeholder involvement in project implementation and monitoring, evaluation, identification, initiation and planning had a significant influence on the performance of road construction projects in Bondo Sub County.	The study was limited to roads in Bondo Sub-county which is a rural county. Therefore, the study was conducted in a different context from the one this study focuses on.
Vilventhan and Kalidindi (2016)	Interrelationships of factors causing delays in the completion of urban roads construction projects.	The study found that a significant source of delay in the projects is the relocation of services, especially in road construction projects. One of the critical factors that caused delays was recognized as difficulty in identifying subterranean services due to absence of data on subterranean services.	This study was conducted in India and therefore fails to capture factors influencing relocation of services in the Kenyan Context. Hence, this study will seek to fill the gap in knowledge.
Macharia (2018)	Factors influencing completion of road construction projects in Embakasi, Nairobi County	It was established that resource availability had a statistically significant and positive influence on completion of road construction projects in Embakasi, Nairobi County.	The study was limited in scope because it focused on Embakasi Sub-County. This study will be conducted to bridge the gap in knowledge by focusing on road construction projects in Nairobi County.
Ndungu, (2008).	Roles of participatory communication in community projects in Dagoretti Constituency, Nairobi County.	The study revealed that the success of participatory communication can be determined by the role played by participatory communication.	The study was limited in scope because it focused on Dagoretti constituency. This study will be conducted to

		Public involvement cannot be felt unless they have information that can help them monitor the project from initiation to completion.	bridge the gap in knowledge by focusing on road construction projects in Nairobi County.
Nduati (2017)	Relationship between completion of Kenya Rural Roads and institutional factors in Ruiru Sub-County, Kenya	The study established that institutional factors including management structure, resource availability, technological advancements and bureaucracy had statistically significant influence on completion of Kenya Rural Roads Authority projects in Ruiru Sub-County, Kenya	The study focused on rural roads under Kenya Rural Roads Authority. The current study focuses on urban road projects under the Kenya Urban Roads Authority.

2.3 Conceptual framework

Bryman and Bell (2015) postulates that a conceptual framework is a model that classifies the variables of the research into independent variables, dependent variable and moderating variable and interlinks their relationship. For this study the dependent variable is implementation of road projects while the independent variables are activity sequencing, resource estimation and activity control and moderating variable is institutional capacity. The conceptualized connection between the main factors is as shown in Figure 1.

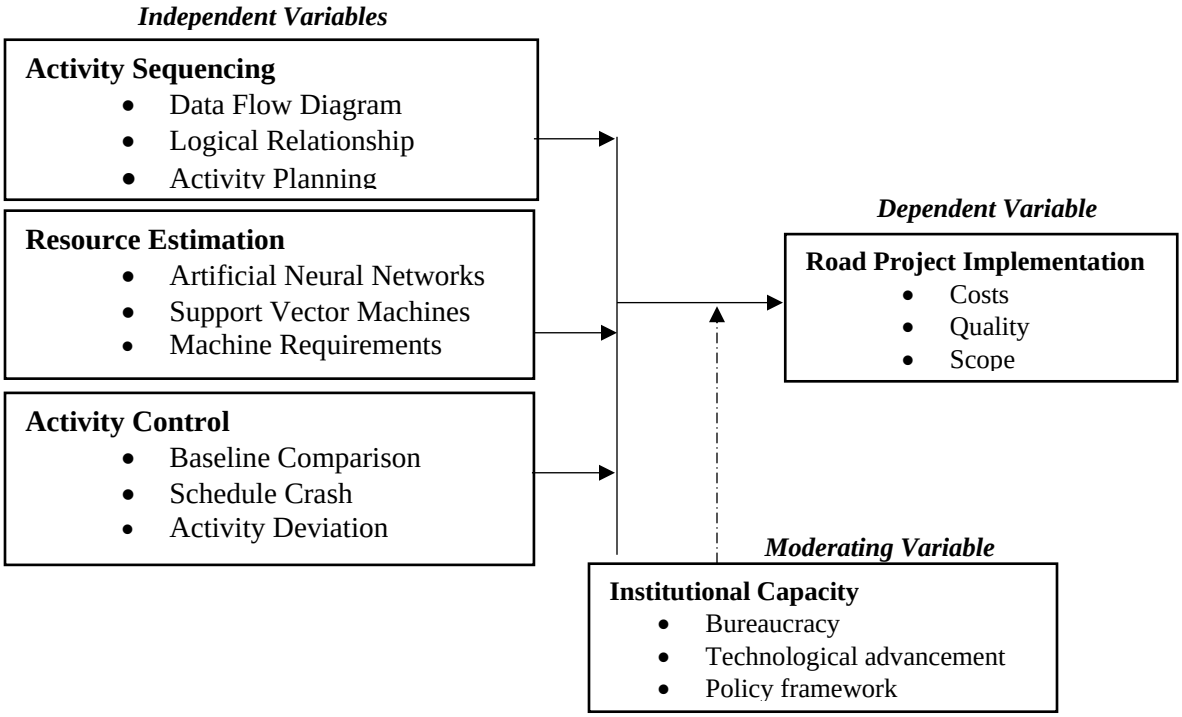

Figure 1: Conceptual Framework

3.0 RESEARCH METHODOLOGY

The study adopted cross sectional research design and collect data using questionnaires from 120 engineers/project managers, supervisors/inspectors and technicians/foremen from 12 organizations including five construction companies involved in urban road construction projects in Kilifi County, five service providers whose utility facilities run along road construction corridors in Kilifi County, and two state corporations charged with the management of road construction in Kenya. Data was analysed using both descriptive and inferential statistics with the help of IBM SPSS Statistics. Descriptive analysis involved the use of frequencies, percentages, mean and standard deviation in order to summarize the results of the various study variables. Inferential analysis involved the application of Pearson correlation and regression analysis to determine the nature of relationship between time management and implementation of road projects in Kilifi County.

4.0 FINDINGS AND PRESENTATION

4.1 Response Rate

Table 2: Response Rate

Response	Frequency	Valid Percent
Returned Questionnaires	93	77.5%
Unreturned Questionnaires	27	22.5%
Total	**120**	**100%**

One hundred and twenty (120) questionnaires were distributed by the researcher to 5 construction companies, 5 service providers and 2 government corporations but only 93 questionnaires were returned, which were completely filled, this represented a response rate of 77.5%. Mugenda and Mugenda (2013), stipulates that a response rate of greater than 50% is good, while a response of more than 60% is very good for the study and a response rate of more than 70% is excellent. Zikmund, Babin, Carr and Griffin (2013), also adds that a 50% response rate is adequate, 60% is good and 70% and above is very good, hence a response rate of 77.5% in this case was found excellent for the study. Nyabanga (2017) in his study of constructions projects in Kisii County, used a response rate of 86% while Ongweno, Muturi and Rambo (2016), in their study of determinants of road completion in Kisumu County, used a response rate of 71.6%.

4.2 Pilot Study Results

Pilot study was conducted on 12 employees of Synhydro Limited, to establish the reliability and validity of the research instrument.

4.2.1 Validity of the Research Instrument

The study used KMO and Bartelett's tests to measure sampling adequacy and spherecity of the four independent variables in order to determine the validity of the research instruments. Hair, Black, Babin and Anderson (2010), emphasis the need for KMO and Bartlett test in research in order to test construct validity and to determine variability among the variables.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.648
Bartlett's Test of Sphericity	Approx. Chi-Square	82.825
	Df	7
	Sig.	.000

Table 2 showed KMO measure of sampling adequacy with a value of test statistic as 0.648, which was above a threshold of 0.5 as recommended by Hair, *et, al.* (2010), hence a slight acceptability of the of factor analysis. Bartlett's test of spherecity indicated (X^2 =82.825; df=5; p= 0.000), which implied that there is a statistically significant relationship between the study variables since p-value < 0.05, hence activity sequencing, resource estimation, activity control and institutional capacity were significant predictors of road projects implementation.

4.2.2 Reliability of the Research Instrument

A measure of internal consistency was employed through Cronbach Alpha to determine the reliability of the research instruments. Cronbach Alpha values range from 0 to 1, with a threshold of an alpha of 0.7, considered appropriate as proposed by Hair *et al*. (2010).

Table 4: Cronbach Alpha

Variables	Number of Items	Cronbach Alpha
Roads Project Implementation	6	0.762
Activity Sequencing	6	0.811
Resource Estimation	6	0.817
Activity Control	6	0.721
Institutional Capacity	5	0.734
Overall Alpha	**29**	**0.748**

The analysis showed that all the variables had an alpha of more than 0.7 as recommended by Hair *et al* (2010), with an overall alpha of 0.748, hence the research instrument was considered reliable, since all the constructs of the measurements had an alpha of more than 0.7. Road project implementation had an alpha of 0.762, activity sequencing had an alpha of 0.811, resource estimation had an alpha of 0.817, activity control had an alpha of 0.721and finally institutional capacity had an alpha of 0.734. Wambui, Ombui and Kagiri (2015), in their study of project completion in Nairobi County determined an alpha of 0.819.

4.3 Descriptive Statistics on the Study Variables

In this section the researcher carried out a descriptive statistic on the dependent variable (project road implementation), independent variables (activity sequencing, resource estimation and activity control) and moderating variable (institutional capacity). The following scale was used: *5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1= Strongly Disagree.*

4.3.1 Road Project Implementation

Table 5: Road Project Implementation

Opinion Statements	Mean	Std. Deviation
Services relocation works have significantly contributed to delays in the completion of the road project	4.2043	.05870
Services relocation works have significantly contributed to cost overruns in the road project	4.0645	.95333
Services relocation works have adversely affected the attainment of deliverables in the road project	3.9032	.88544
Services relocation works have had a negative impact on the quality of the road project	3.0430	1.03119
Poor financial resource planning contributes to budget constraints hampering project implementation	3.5312	.6894
Project implementation phase ensures transparency with regard to funds	3.4617	1.0561
Valid N = 93		
Average	**3.7013**	**.77903**

Majority of the respondents strongly agreed that services relocation works have significantly contributed to delays in the completion of the road project with (M=4.2043; SD=.05870), they also strongly agreed that services relocation works have significantly contributed to cost overruns in the road project with (M=4.0645; SD=0.95333). The respondents agreed that services relocation works have adversely affected the attainment of deliverables in the road project with (M=3.9032; SD=0.88544) and they agreed that poor financial resource planning contributes to budget constraints hampering project implementation with (M=3.5312; SD=0.6894). The respondents also agreed that the project implementation phase ensures transparency with regard to funds with (M=3.4617; SD=0.6894) and they agreed that service relocation works have had a negative impact on the quality of the road project with (M=3.0430; 1.03119). The overall mean of 3.7013 and standard deviation of 0.77903, implied that majority of the respondents agreed that there were several factors related to time management affecting road project construction, this supports the findings of Aeon and Aguinis (2017), where it was established that in construction projects, the need of time management reflects success and failure of the project.

4.3.2 Institutional Capacity

On the moderating variable, the respondents were asked to indicate the extent in which they agree with the various statements on the moderation role of institutional capacity on the relationship between factors and project completion.

Table 6: Institutional Capacity

Opinion Statements	Mean	Std. Deviation
The management structure of the organization has many lines of authority which leads to delays in decision making on services relocation works	3.5161	1.35625
The management structure of the organization hinders smooth and quick flow of information within the organization and with external stakeholders	3.3656	1.38928
Lengthy and cumbersome bureaucracies in the organization impede quick response to rapid change in requirement for the services relocation	3.6237	1.29308
Technology advancement in the organization ensure efficient and effective management of services	3.9032	.83490
The organization has policies and strategies in place for effective execution of services relocation works	3.4731	.97347
Valid N=93		
Average	**3.5763**	**1.16940**

Table 6, showed that the respondents agreed that technology advancement in the organization ensure efficient and effective management of services with (M=3.9032; SD=0.83490) and they also agreed that lengthy and cumbersome bureaucracies in the organization impede quick response to rapid change in requirement for the services relocation with (M=3.6237; SD=1.29308). The respondents agreed that management structure of the organization has many lines of authority which leads to delays in decision making on services relocation works with (M=3.5161; SD=1.35625), the analysis further determined that the organization has policies and strategies in place for effective execution of services relocation works with (M=3.4731; SD=0.97347). Finally, the analysis showed the respondents agreed that the management structure of the organization hinders smooth and quick flow of information within the organization and with external stakeholders with (M=3.3656; SD=1.38928). The overall mean of 3.5763 and standard deviation of 1.16940, implied that the respondents agreed that institutional capacity had a moderating effect on the relationship between time management and road projects implementation and there was a high variation from the mean since standard deviation was > 1. This supports the findings of Nduati (2017), who established that different organizational variables may influence the ability of an organization responsible for supervising road construction projects to ensure efficient and effective relocation of services, which may result in delays in road construction and cost overruns.

4.3.3 Activity Sequencing

On the first independent variable the respondents were also asked to indicate the extent in which they agree with the various statements on activity sequencing.

Table 7: Activity Sequencing

Opinion Statements	Mean	Std. Deviation
Sequencing of the activities allows the finalization of activities for project implementation	2.9032	1.10399
Project managers always presents the activities of the project in a network diagram	3.3548	.95149
Activity sequencing creates logical relationship among tasks	3.2043	1.09900
The organization has a software used in the activity sequencing for project implementation	4.0753	.08400
The organization has adequate techniques and tools used in project management sequence	2.9355	.96466
Activity sequencing allows project managers to plan their time	3.5631	.73521
Average	**3.3339**	**.94906**

Table 7 showed that the respondents strongly agreed that the organization has a software used in the activity sequencing for project implementation with (M=4.0753; SD=0.084). The respondents also agreed that activity sequencing allows project managers to plan their time with (M=3.5631; SD=0.73521) and they agreed that project managers always present the activities of the project in a network diagram with (M=3.3548; SD=0.95149). The respondents also agreed that activity sequencing creates logical relationships among tasks with (M=3.2043; SD=1.099). They were neutral on the statement that the organization has adequate techniques and tools used in project management sequence with (M=2.9355; SD=0.96466) and they were further neutral that sequencing of the activities allows the finalization of activities for project implementation with (M=2.9032; SD=1.10399). On the overall mean of 3.3339 and standard deviation of 0.94906, implied that the respondents agreed that activity sequencing affects road projects implementation and there was a weak variation from the mean since standard deviation was < 1. These findings cognate with the study of Alvarez (2016), who established that time schedule to be achievable and be realistic, activity sequencing must be accurate to support future development.

4.3.4 Resource Estimation

On the second independent variable, the respondents were asked to indicate the extent in which they agree with the various statements on resource estimation.

Table 8: Resource Estimation

Opinion Statements	Mean	Std. Deviation
Service lines within the road reserves are identified early and their resource requirements incorporated in the budget and resource schedule of the road project	3.6559	.90283
Human resource requirements in terms of skilled and unskilled manpower are always factored in the project plans to efficiently handle services relocation works	3.4946	.98493
The financial requirements for the services relocation works are determined, sources identified, and proper management systems put in place to ensure accountability	3.5269	.98457
The project team engage services of experts in the relocation works	3.5161	1.35625
Machinery requirements for services relocation works are determined and secured in a timely and cost-effective manner	3.3656	1.38928
The organization has various techniques and tools used in resource estimation	2.8371	1.24011
Average	**3.3994**	**1.142995**

It was determined that the respondents agreed that service lines within the road reserves were identified early and their resource requirements incorporated in the budget and resource schedule of the road project with (M=3.6559; SD= 0.90283) and they also agreed that the financial requirements for the services relocation works are determined, sources identified, and proper management systems put in place to ensure accountability with (M=3.5269; SD=0.98457). The respondents also agreed that the project team engage services of experts in the relocation works with (M=3.5161; SD=1.35625) and they agreed that human resource requirements in terms of skilled and unskilled manpower are always factored in the project plans to efficiently handle services relocation works with (M=3.4946; SD=0.98493). The analysis further showed that the respondents agreed that machinery requirements for services relocation works are determined and secured in a timely and cost-effective manner with (M=3.3656; SD=1.38928) and they were neutral that the organization has various techniques and tools used in resource estimation with (M=2.8371; SD=1.24011). The overall mean of 3.3994 and standard deviation of 1.142995, which implied that respondents agreed that resource estimation affects road project implementation and there was a strong variation from the mean since the standard deviation was > 1. These findings corroborate the findings of Invensis (2017), who postulates that resource estimation provides the foundation for road construction projects and it influences the costing procedure of the road construction life cycle.

4.3.5 Activity Control

On the final independent variable, the respondents were asked to indicate the extent in which they agree with the various statements on activity control.

Table 9: Activity Control

Opinion Statements	Mean	Std. Deviation
Project managers use feedbacks to monitor the project	3.7692	1.06281
Project managers constantly motivates team members to complete their tasks properly	3.7949	1.39886
Actions are usually taken to reschedule and expedite activities on time	4.1538	.93298
Activities required for project completion are usually broken down into phases to ensure timely project completion	3.8718	1.00471
Preparation of the Gantt chart allows activity control during project implementation	4.1795	.82308
Activity control allows project manager to check for deviations from the expected activity output	3.2134	.67921
Average	**3.8304**	**.98361**

The analysis showed that the respondents strongly agreed that preparation of the Gantt chart allows activity control during project implementation with (M=4.1795; SD=0.82308) and they further strongly agreed that actions were usually taken to reschedule and expedite activities on time with (M=4.1538; SD=0.93298). The respondents also agreed that activities required for project completion are usually broken down into phases to ensure timely project completion with (M=3.8718; SD= 1.00471) and they agreed that project managers constantly motivate team members to complete their tasks properly with (M=3.7949; SD=1.39886). They also agreed that project managers use feedbacks to monitor the project with (M=3.7692; SD=1.06281) and they finally agreed that activity control allows project manager to check for deviations from the expected activity output with (M=3.2134; SD=0.67921). with the overall mean of 3.8304 and standard deviation of 0.98361, generally implied that the respondents agreed that activity control affects road project implementation and there was a small variation from the mean since standard deviation was < 1. The above findings support PMI (2014), who established that activity control allows corrective actions to be taken such as time schedule compression to allow completion of activities earlier than planned.

4.4 Pearson's Correlation

To establish the strength and direction of relationship between the study variables, the Pearson correlation (r) was used. According to Kothari (2014), the r values ranges from -1 to +1, with +1, indicating a perfect positive correlation, while 0, indicating no correlation and finally -1 indicating a perfect negative correlation.

Table 10: Correlation Coefficient

Variables		Y	X1	X2	X3	M
Y	Pearson Correlation	1				
	Sig. (2-tailed)					
X1	Pearson Correlation	.688**	1			
	Sig (2-tailed)	.000				
X2	Pearson Correlation	.721**	.681**	1		
	Sig (2-tailed)	.002	.001			
X3	Pearson Correlation	.909**	.644**	.699**	1	
	Sig (2-tailed)	.000	.000	.003		
M	Pearson Correlation	.558**	.428**	.444**	.515**	1
	Sig (2-tailed)	.003	.009	.006	.004	
	N	93	93	93	93	93

*** Correlation is significant at 0.01*

Y= implementation of road construction projects, X1 = activity sequencing, X2 = resource estimation, X3 = activity control, M = institutional capacity

The correlation matrix indicated that there was a strong positive significant correlation between activity sequencing and road project implementation (r = 0.688, P=0.000 < 0.01). This means that there is a strong significant relationship between activity sequencing and road project implementation, this supports the study by Alvarez (2016). Resource estimation positively road project implementation. The correlation of resource estimation and road project implementation was also very strong and positively significant (r = 0.721, P = 0.002 < 0.01). This finding corroborates the study by Invensis (2017) who found that activity control positively predicts road project implementation. The relationship is very strong and positive; meaning enhancing activity control would lead to positive achievement in road project implementation. The correlation of activity control and trade facilitation was positively significant (r = 0.909, P= 0.000< 0.01), this supports the report by PMI (2014), and the correlation of moderator variable (institutional capacity) and road project implementation was also positively significant and the relationship was above moderate (r = 0.558, P=0. .003 < 0.01). This was in tandem with the findings of Nduati (2017 as shown in Table 10. In a nutshell, the findings implied that the independent variables (activity sequencing, activity control and resource estimation) together with the moderator (institutional capacity) positively influence road projects implementation.

4.5 Hierarchical Regression Analysis

After testing the regression assumptions and preliminary analysis of relationship through Pearson correlation, hierarchical regression model was used. To test whether institutional capacity (M) moderated activity sequencing (X1), resource estimation (X2), and activity control (X3) on road project implementation (Y) the interactions were tested. The predictor variables were converted to Z scores with a mean of zero and standard deviation of one, in other words they were standardized to avoid multi-collinearity problem created through formation of an interaction term as recommended by Aiken and West (2011).

4.5.1 Coefficient of Determination

The results for the model summary are as presented in Table 11.

Table 11: Model Summary

Model	R	R Square	Adjusted R Square	Std Error of Estimate	R Square Change	F Change	df1	df2	Sig F Change
1	.922[a]	.851	.840	.387	.840	169.0	3	89	.000
2	.926[b]	.857	.851	.380	.011	37.18	1	88	.001
3	.936[c]	.876	.869	.353	.018	9.280	1	87	.000
4	.938[d]	.880	.872	.347	.003	17.02	1	86	.002
5	.914[e]	.836	.822	.315	.050	5.82	1	85	.000

Durbin-Watson Statistics: 1.832

From the model summary, results of time management practices and their interactions with institutional capacity on road project implementation are shown. The findings' independent variables (activity sequencing, resource estimation and activity control) explained 84% (R^2 = 0.840) of the variance on road projects implementation which was statistically highly significant. This indicated that the three independent variables predicted road project implementation. Introduced institutional capacity on the other hand in model 2 explained only 85.1% (R^2 = 0.851) of the variance on road project implementation which contributed an addition of 1.1%. This indicates an overlap by the independent variables that constitute time management practices and institutional capacity which is a moderator on the prediction of road project implementation

As indicated in model 3 interaction of Z score institutional capacity Z score activity sequencing explained 86.9% (R^2 = 0.869) of the variance on road project implementation which resulted in R^2 change of 1.8% (0.018) which was statistically significant. In practice, activity sequencing interacts with institutional capacity that are favourable to the road contractors'' interest is affected positively enhancing road construction implementation. In addition, interaction of Z score institutional capacity * Z score resource estimation explained 87.2% (R^2 = 0.872) of the variance in road construction implementation. This contributed an addition R^2 of 0.3% (0.003) which was statistically significant as shown in model 4. However, interaction of Z score institutional capacity *Z score activity control as shown in model 5 explained 82.2% (R2 =0.822) of the variance in road project implementation resulting in R^2 change of 5.0% (0.050) which was highly statistically significant.

4.5.2 Analysis of Variance

Table 12: ANOVA Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	218.53	3	72.84	169.0	.000[b]
	Residual	38.379	89	.431		
	Total	256.909	92			
2	Regression	220.148	4	55.037	131.82	.000[c]
	Residual	36.742	88	.418		
	Total	256.89	92			
3	Regression	224.091	5	44.818	122.54	.000[d]
	Residual	31.819	87	.366		
	Total	255.91	92			
4	Regression	225.377	6	37.56	105.52	.000[e]
	Residual	30.612	86	0.356		
	Total	255.989	92			
5	Regression	230.387	7	32.912	111.34	.000[f]
	Residual	25.126	85	0.296		
	Total	275.513	92			

The results shown in Table 12 as indicated by the model showed good model fit as illustrated by overall test of significance with F-test values of 169.0, 131.82, 122.54, 105.52 and 111.34 respectively with p value 0.000 < 0.05 (level of significance) were statistically highly significant. In other words, activity sequencing, resource estimation and activity control and their interaction with institutional capacity were statistically significant predictors of road project implementation. The moderator resource estimation was not related to either the independent variable or interaction term rather it interacted with the independent variables to modify the form of the relationship between independent variable, moderating variable and interaction terms.

4.5.3 Regression Coefficient Without Moderation

Table 13: Regression Analysis Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	β	Std. Error	Beta	T	Sig.
(Constant)	1.083	0.266		4.071	0.000
ZX1	0.127	0.062	0.114	2.037	0.044
ZX2	0.218	0.077	0.336	2.741	0.005
ZX3	0.173	0.057	0.122	3.045	0.003

Y= implementation of road construction projects, ZX1 = activity sequencing composite, ZX2 = resource estimation composite, ZX3 = activity control composite

In the first step, the effect of activity sequencing, resource estimation and activity sequencing on road project implementation was established. The multiple regression results presented in Table 13 indicated that activity sequencing (β = 0.127, t = 2.037, P=0.044 <0.05), resource estimation (β = 0.218, t = 2.741, P = 0.005<0.05) and activity control (β = 0.173, t =3.045, P = 0.003<0.05) were positive and statistically highly significant predictors of road project implementation.

Hierarchical Regression Results of Institutional Capacity on Road Project Implementation

Table 14: Hierarchical Regression Results of Institutional Capacity on Road Project Completion

	Unstandardized Coefficients		Standardized Coefficients		
	β	Std. Error	Beta	T	Sig.
(Constant)	1.083	0.266		4.071	0.000
ZX1	0.127	0.062	0.114	2.037	0.045
ZX2	0.218	0.077	0.336	2.741	0.007
ZX3	0.173	0.057	0.122	3.045	0.003
ZM	0.185	0.043	0.167	4.302	0.000

Y= implementation of road construction projects, ZX1 = activity sequencing composite, ZX2 = resource estimation composite, ZX3 = activity control composite, ZM = institutional capacity composite

Hierarchical regression results presented in Table 14, indicated step two of the hierarchical regression where institutional capacity (β = 0.185, t = 4.302, P=0.000 < 0.05) was found to be positive and statistically significant predictor of road project implementation. According to Wright, Strubler and Vallano, (2011) when a moderating variable (institutional capacity) is introduced to a regression model and a significant relationship with dependent variable (road project implementation) is determined, the moderator hypothesis is supported. In other words, if the interaction terms were found to be insignificant, the moderator hypothesis would not be supported.

Hierarchical Regression Results of Institutional Capacity and Activity Sequencing

Table 15: Hierarchical Regression Results of Institutional Capacity and Activity Sequencing

	Unstandardized Coefficients		Standardized Coefficients		
	β	Std. Error	Beta	T	Sig.
(Constant)	1.083	0.266		4.071	0.000
ZX1	0.127	0.062	0.114	2.037	0.045
ZX2	0.218	0.077	0.336	2.741	0.007
ZX3	0.173	0.057	0.122	3.045	0.003
ZM	0.185	0.043	0.167	4.302	0.000
ZX1*ZM	0.121	0.018	0.121	6.722	0.000

*Y= implementation of road construction projects, ZX1 = activity sequencing composite, ZX2 = resource estimation composite, ZX3 = activity control composite, ZM = institutional capacity composite, ZX1*ZM = interaction term*

The interaction of institutional capacity and activity sequencing was entered, the hierarchical regression coefficient of interaction (β = 0.121, t =6.722, P= 0.000<0.05) was positive and statistically highly significant as shown in Table 15. This confirmed that institutional capacity moderated the effect of activity sequencing on road project implementation.

Hierarchical Regression Results of Institutional Capacity and Resource Estimation

Table 16: Hierarchical Regression Results of Institutional Capacity and Resource Estimation

	Unstandardized Coefficients		Standardized Coefficients		
	β	Std. Error	Beta	T	Sig.
(Constant)	1.083	0.266		4.071	0.000
ZX1	0.127	0.062	0.114	2.037	0.045
ZX2	0.218	0.077	0.336	2.741	0.007
ZX3	0.173	0.057	0.122	3.045	0.003
ZM	0.185	0.043	0.167	4.302	0.000
ZX1*ZM	0.121	0.018	0.121	6.722	0.000
ZX2*ZM	0.081	0.025	0.078	3.241	0.002

*Y= implementation of road construction projects, ZX1 = activity sequencing composite, ZX2 = resource estimation composite, ZX3 = activity control composite, ZM = institutional capacity composite, ZX1*ZM = interaction term, ZX2*ZM = interaction term*

In this step the interaction of institutional capacity and resource estimation was entered. Hierarchical regression coefficient of the institutional capacity and resource estimation (β = 0.080, t = 3.131, P =0.000<0.05) was positive and statistically highly significant as shown in Table 16. This confirmed that institutional capacity moderated the effect of resource estimation on road project implementation.

Hierarchical Regression Results of Institutional Capacity and Activity Control

Table 17: Hierarchical Regression Results of Activity Control and Road Project Implementation

	Unstandardized Coefficients		Standardized Coefficients		
	β	Std. Error	Beta	T	Sig.
(Constant)	1.083	0.266		4.071	0.000
ZX1	0.127	0.062	0.114	2.037	0.045
ZX2	0.218	0.077	0.336	2.741	0.007
ZX3	0.173	0.057	0.122	3.045	0.003
ZM	0.185	0.043	0.167	4.302	0.000
ZX1*ZM	0.121	0.018	0.121	6.722	0.000
ZX2*ZM	0.081	0.025	0.078	3.241	0.002
ZX3*ZM	0.214	0.028	0.211	7.388	0.000

*Y= implementation of road construction projects, ZX1 = activity sequencing composite, ZX2 = resource estimation composite, ZX3 = activity control composite, ZM = institutional capacity composite, ZX1*ZM = interaction term, ZX2*ZM = interaction term, ZX3*ZM = interaction term*

In the fifth step the interaction of institutional capacity and activity control was entered. Hierarchical regression coefficient of the interaction between institutional capacity and activity control ($\beta = 0.214$, $t = 7.388$, $P= 0.000<0.05$) was positive and statistically highly significant, as depicted in Table 17. This confirmed that institutional capacity moderated the effect of activity control on road projects implementation.

4.6 Hypothesis Testing

Table 18: Hypothesis Summary

Null Hypothesis	P-values	Decision
H_{01}: Activity sequencing does not significantly influence the implementation of road construction projects in Kilifi County	0.000	Rejected
H_{02}: Resource estimation does not significantly influence the implementation of road construction projects in Kilifi County.	0.045	Rejected
H_{03}: Activity control does not significantly influence the implementation of road construction projects in Kilifi County.	0.007	Rejected
H_{04}: Institutional capacity does not significantly moderate the influence of time management on the implementation of road construction projects in Kilifi County.	0.003,0.000, 0.002, 0.000	Rejected

To test four hypotheses statements, hierarchical multiple regression was conducted using the SPSS at 95% confidence level to determine the p-values for the independent variables; activity sequencing, resource estimation and activity control and the moderating variable; institutional capacity. P-values were compared with 5% (0.05) significant level, such that when p-value was more than the significance level, the model was considered null hypothesis was rejected.

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of the findings

5.2.1 Activity Sequencing and Road Project Implementation

On the first objective, it was determined that activity sequencing positively and significantly affects road constructions projects in Kilifi County ($r = 0.688$, $P=0.000 < 0.01$). The study further determined that a unit improvement in activity sequencing would significantly lead to improvement in road project implementation ($\beta = 0.127$, $t = 2.037$, $P=0.044 <0.05$). The study also determined that sequencing of the activities allows the finalization of activities for project implementation and project managers always present the activities of the project in a network diagram. The study also revealed that activity sequencing creates logical relationships among tasks and the organization has a software used in the activity sequencing for project implementation. It was further determined that the organization has adequate techniques and tools used in project management sequence and activity sequencing allows project managers to plan their time.

5.2.2 Resource Estimation and Road Project Implementation

On the second objective, the researcher found out that resource estimation positively and significantly affects implementation of road constructions projects in Kilifi County ($r = 0.721$, $P = 0.002 < 0.01$). The analysis also showed that a unit improvement in resource estimation would lead to a unit improvement in road project implementation ($\beta = 0.218$, $t = 2.741$, $P = 0.005<0.05$). The study also found out that service lines within the road reserves are identified early and their resource requirements incorporated in the budget and resource schedule of the road project and human resource requirements in terms of skilled and unskilled manpower are always factored in the project plans to efficiently handle services relocation works. The study further determined that the financial requirements for the services relocation works were determined, sources identified, and proper management systems put in place to ensure accountability and the project team engage services of experts in the relocation works. Further on this objective, the study determined that machinery requirements for services relocation works are determined and secured in a timely and cost-effective manner and the organization has various techniques and tools used in resource estimation.

5.2.3 Activity Control and Road Project Implementation

On the third objective, it was revealed that activity control significantly and positively predicts implementation of road construction projects in Kilifi County ($r = 0.909$, $P= 0.000< 0.01$). The regression analysis showed that a unit improvement in activity control would significantly lead to an improvement in implementation of road construction projects in the county ($\beta = 0.173$, $t =3.045$, $P = 0.003<0.05$). The study further found out that project managers use feedback to monitor the project and project managers constantly motivate team members to complete their tasks properly. The study also determined that actions were usually taken to reschedule and expedite activities on time and activities required for project completion are usually broken down into phases to ensure timely project completion. The study determined that preparation of the Gantt chart allows activity control during project implementation and activity control allows project managers to check for deviations from the expected activity output.

5.2.4 Moderating Influence of Institutional Capacity on Time Management and Road Project Implementation

On the final objective, it was preliminarily determined that institutional capacity affects road projects implementation ($r = 0.558$, $P=0. .003 < 0.01$). It was also determined that institutional capacity has moderating influence on the relationship between time management and road project implementation ($\beta = 0.185$, $t = 4.302$, $P=0.000 < 0.05$). It was also determined that institutional capacity has a interaction effect on various practices of time management in Kilifi County; activity sequencing ($\beta = 0.121$, $t =6.722$, $P= 0.000<0.05$), resource estimation ($\beta = 0.080$, $t = 3.131$, $P =0.000<0.05$) and finally activity control ($\beta = 0.214$, $t = 7.388$, $P= 0.000<0.05$). The study also determined that the management structure of the organization has many lines of authority which leads to delays in decision making on services relocation works and the management structure of the organization hinders smooth and quick flow of information within the organization and with external stakeholders. The study further found out that lengthy and cumbersome bureaucracies in the organization impede quick response to rapid change in requirements for the services relocation and technology advancements in the organization ensure efficient and effective management of

services relocation works. The study finally found out that the organization has policies and strategies in place for effective execution of services relocation works.

5.3 Conclusion

Based on the analysis and study findings, this research concludes that time management practices in road projects such as activity control, activity sequencing and resource estimation significantly and positively predicts road projects implementation in Kilifi County. In addition, the institution capacity also affects and predicts road project implementation. The study also revealed that time management practices above can be moderated with institutional capacity significantly and these factors partially affect implementation of road construction projects in the county. The study also concludes that Services relocation works had significantly contributed to delays in the implementation of the road project and it further significantly contributed to cost overruns in the road project. The study also concluded that services relocation works had adversely affected the attainment of deliverables in the road project and it had a negative impact on the quality of the road project. The study finally concluded that poor financial resource planning contributes to budget constraints hampering project implementation and project implementation phase ensured transparency with regard to funds.

5.4 Recommendation of the Study

Based on the study analysis, summary of findings and conclusion of the study, this research recommends that for effective time management during implementation of road construction projects, there should stakeholder involvement as this will facilitate ideas and perspective. Stakeholder involvement in time management and planning, will better their correspondence, improve accuracy of information, increase credibility and acceptance findings and finally improve the quality road constructions projects in Kilifi County. This research further recommends that skill level on time management should be improved to meet the needs road construction projects in the County and this should be augmented to meet the needs of the projects. An ongoing investment in developing such employees' capacity in time management during the construction of road projects is necessary. The study further recommends that the various road construction authorities in the county should allocate enough resources needed for construction of the road projects, they should also reduce the bureaucratic procedures associated with the implementation of these projects. The study further recommends that monitoring and evaluation should agree on a practical arrangement to support finance the associated activities.

Good communication between various stakeholders in the construction organizations team is fundamental to road project completion. This will facilitate a collaborative environment in the road construction and not an adversarial one, hence reducing time wastage in the implementation process. Integrating technology such as application simulation techniques using various projects softwares into the road construction projects could be one of the best ways that contribute to road projects implementation and early completion. When road project team members see their test results and work progress immediately, they are more likely to be motivated and interested towards the outcome of the road construction projects project.

The study further recommends monitoring and evaluation of road construction projects should be done using information and communication technologies as this will facilitate effective time

management in the implementation process by the road construction authorities and companies in the County. This paper finally recommends that government authorities should offer the necessary goodwill and support to enhance implementation and completion of road construction projects, especially through elimination of unnecessary bureaucratic procedures. Unnecessary influence and interference from political leaders on road projects implementation and completion should be deterred.

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