PROJECT INITIATION PRACTICES AND PERFORMANCE OF GOVERNMENT CONSTRUCTION PROJECTS IN KENYA

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Project Initiation Practices and Performance of Government Construction Projects in Kenya

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DECLARATION

This thesis is my original work and has not been presented for degree in any other university.

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This thesis has been submitted for examination with our approval as University Supervisors

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DEDICATION

This study is dedicated to my daughter Rosaleen Njoki and my son Jesse Ngugi, my family and friends for their support, encouragement and patience during my study period at the university.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
ANP	Analytical Network Process
ICT	Information communication and technology
KAA	Kenya Airport Authority
KENHA	Kenya National Highways Authority
KERRA	Kenya Rural Roads Authority
KFS	Kenya Ferry Services
KPA	Kenya Ports Authority
KMA	Kenya Maritime Authority
KNBS	Kenya National Bureau of Statistics
KURA	Kenya Urban Road Authority
KRC	Kenya Railway Corporation
NACOSTI	National Commission for Science, Technology and innovation
NCA	National Construction Authority
NCCG	Nairobi City County Government
NHC	National Housing Corporation
NGOs	Non-Governmental Organizations
NPMS	National Project Management System
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
SMEs	Small Medium Enterprises

SPSS   Statistical Packages for Social Sciences

TOC   Theory of Constraints

DEFINITION OF OPERATIONAL TERMS

Practice   Is a precise type of professional or management activity that contributes to implementation of a process and that may employ adoption of a plan, technique and tools (Atout, 2020).

Project Feasibility Study Feasibility study is used to determine the viability of an idea, such as ensuring a project is legally and technically feasible as well as economically justifiable (Kerzner, 2018).

Project Initiation Practices It involves the creation of guidelines to assist in project management through identification of key components of projects and determination of essential steps to achieve the set project objectives (Justin et al., 2016).

Project Management   The practice of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria at the specified time (Kerzner, 2018).

Project Performance   Is the standards at which a project is delivered as it was stipulated in the contract between the client and the service deliverer (Gitamo, 2018).

Project Team   It is a small or large number of people with complementary skills who are committed to achieve the project objectives (Chan et al., 2021).

Project   It is a short-term task carried out to produce products or services that are distinct within a definite ending point, and unique means and are

carried out in line with the strategic objectives of the organization (Owuori et al., 2020).

Resource Mobilization   It is the acquiring of financial resources, mapping human resources, acquisition of physical resources, community involvement and participation, accountability and transparency, financial accounting and management (Densford et al., 2018a).

Risk Identification   It is the process of determining risks that could hypothetically prevent the project, innovativeness or investment from accomplishing its objectives (Tamošaitienė, 2018).

Scope Definition   Project scope is the part of project planning that involves determining and documenting a list of specific project goals, deliverables, features, functions, tasks, deadlines, and ultimately costs (Majumder et al., 2022).

ABSTRACT

Construction projects failures are increasingly reported around the globe and achieving success of construction projects is becoming extremely difficult in today's turbulent environment. Despite the current developments in project management processes and tools, project success rate has failed to significantly improve due to challenges that are traceable to factors that should have been addressed at project initiation stage. The purpose of this study was to examine the relationship between project initiation practices and performance of government construction projects in Kenya by focusing on five objectives; to establish the relationship between risk identification, scope definition, project feasibility study, project team selection and performance of construction projects and the moderating role of resource mobilization. The study was guided specifically by four theories; prospect, theory of constraint, theory of change and project management competency theory. The study adopted a conceptual framework to illustrate the relationship between the independent variable (project initiation practices) and dependent variable (performance of construction projects). The study used a cross sectional research design and research Positivism philosophy. The unit of observation was the project managers while the unit of analysis was the construction projects in the ministry of transport, infrastructure, housing and urban development. The target population was 320 government construction projects. Simple random sampling was used to select 178 construction project that formed the sample size. Data was collected using semi- structured questionnaire. After the data was collected, it was subjected to editing, handling blank responses, coding categorizing and keyed into statistical package for social science computer software for analysis version 24. The study adopted descriptive statistics and inferential statistics. The data was presented using tables, charts and graphs. The response rate of the study was 88.2%. The study found that there was significant corresponding change in project performance for every change in all the five variables jointly. Based on the findings, it can be concluded that risk identification, project scope definition, project feasibility study, project team selection and resource mobilization had a positive and significant relationship with performance of construction projects in Kenya. Further it was established that resource mobilization had an influence on project performance and it is very essential during project commencement meaning it was good moderator to moderate the relationship between project initiation practices and project performance. The study recommends that project managers and all the stakeholders need to embrace risk identification during the project initiation stage as a way of ensuring that any risks that could occur and affect the successful implementation of the projects are reported and mitigated early enough. Further the project managers ought to embrace definition of project scope right at the initial stages of the project by deriving well-articulated project objectives and setting clear derivable which aligned to the objectives of the project. In addition, the study also recommends the need to undertake a project feasibility study before a project commences and is also a need to conduct an effective process of selecting the project team to ensure the right project team is selected. The study recommended that future research should be carried out to focus on other categories of projects, which are also essential in economic growth and development.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The aim of this study was to determine the influence of project initiation practices on the performance of government construction projects in Kenya. Specifically, this chapter covered the background of the study, the statement of the problem, the objectives of the study and the research hypothesis that this study was seeking to answer. The justification of the study and scope of the study was also presented in the chapter. The background of the study was presented using the funnel approach entailing the global, African and the Kenyan perspectives.

From its roots in the management, and particularly the control, of large-scale industrial and military projects, there have been increasing calls for project management to better reflect the lived reality and actual approaches of project managers (Marić, 2019). According to Turner (2020) areas of concern are how the organization decides to initiate projects, and how it ensures that the projects that are chosen are the right ones. Cha et al. (2018) notes that improved framing of project initiation decisions requires a better understanding of the link between projects and organizational strategy, including an understanding of the influence of political processes on initiation decisions and of the broader context in which project results will be implemented.

Zhou et al., (2019) argued that the development of the project idea is the most critical stage associated with the project, and the one likely to have the highest influence on project success or failure. According to Turner (2020) project initiation, which he calls 'project scoping' consists of recruiting the project manager, eliciting the true needs of the client, documenting the client's needs, negotiating with the client about how those needs will be met, writing project overview statement, gaining senior management approval to plan the project. The initial strategic conception of a project represents possibly the most critical decision, and is likely to have the greatest impact on project success or failure (Shenhar et al., 2016). This proclamation also recognizes the role of the project as a vehicle for creating strategic value, which therefore means that a

project needs to be initiated with an appreciation for the context in which it will be executed (Dixit et al., 2019).

According to Mesly (2017), understanding the initiation of projects requires first exploring and defining the domain of project management. Notably problematic in investigating the decision-making process surrounding the initiation of projects is the ability to clearly articulate where the boundaries of the project lie. Venczel et al., (2021) argue that despite the current developments in project management processes and tools, project success rate has failed to significantly improve due challenges that are traceable to factors that should have been addressed at project initiation stage. Poor project initiation practices may contribute to the shaky foundation of many projects, which make them slacken in terms of completion rates regarding the intended and actual completion period (Ngunjiri, 2018). Therefore, focusing on project initiation practices is essential in unlocking the project success.

1.1.1 Project Initiation Practices

The project initiation practices have been linked to have a significant influence on project performance in both developing and developed world. In the global context Bahadorestani et al. (2020) undertook a metadata analysis to examine the role of project initiation in project performance. The study found that in Finland, the purpose of project initiation process included assessment of the project's feasibility and suitability from diverse project stakeholders. In Europe for instance, during project initiation, preparatory studies as may be required are initiated by the donor agency. Relevant project ideas are developed into project plans. This phase is also often called the Project Formulation Process, referring to the process of formulating specific project plans (Tereso et al., 2019). The stress during the formulation phase is on ascertaining the feasibility, sustainability and quality of the suggested intervention and project plan. Beneficiaries and other stakeholders participate in the detailed specification of the project idea that is then assessed for its feasibility (whether it is likely to succeed) and sustainability (whether it is likely to generate long-term benefits) (Khan et al., 2020). In Australia during project initiation the specifications of the

projects are defined, project objectives are established and agreed on, the project teams are formed and major responsibilities are assigned to them (Bahadorestani et al., 2020).

The influence of project initiation practices on project performance in the African context is not different from the global context. In Rwanda, Justin et al. (2016) examined the role of project initiation on project success within Rwandan health services. The study conceptualized project initiation as the creation of sound guidelines for project management and determination of steps to follow in implementation of those projects. In this context, amongst the aspects that are identified include timelines and persons in charge of diverse steps in project management aspects. The study found a week but positive correlational relationship between project initiation and project success.

In Nigeria, Igwe and Ude (2018), found that project initiation and planning is no longer a special-need management but is rapidly becoming a standard way of doing both private and public sector businesses. This is because the growth of any developed or developing nation is hinged upon successful project planning and implementation of development projects and infrastructures. For the projects to be successfully implemented and completed, they must be adequately planned, budgeted for and funded. Funding is normally done by government or donor agencies through the allocation of scarce resources (Igwe & Ude, 2018).

In a study based in Zambia, Mkuni, (2016) sought to examine the role of project initiation in the completion of road construction projects in the country. The study conceptualized the project initiation process as the process of defining project objectives, scope, intended purpose and expected deliverables. The study indicated that project initiation aspects that influenced project performance included stakeholders involved in project initiation aspects. Politicians influence project initiation process leading to the undermining of viability of projects in Zambia (Mkuni, 2016).

In the local context, Maunda and Moronge, (2016) evaluated the influence of life cycle management on completion of public projects in Kenya and found a positive correlation between project initiation phase and project performance. The study

recommended that during the project initiation phase there is need to carry out problem identification, funding and costing to increase the completion of public projects.

According to Iha, (2014) who conducted a study on the factors influencing project initiation in respect to the bible translation projects in Kenya he conceptualized that project initiation lay down the foundation for everything that fall in place systematically as per the structure of the project. He further argued that project initiation phase involves the definition of the key aspects of the project and product scope.

According to Ong'ondo et al. (2019), project initiation is a critical phase in project management. It starts with a joint meeting of project stakeholders to clearly understand objectives, deliverables and criteria of project success during project selection, the need and viability for the project is defined and justified. At this stage, the desired outcomes and benefits are specifically outlined, quantified and agreed upon. The project plan is drafted detailing activities to be executed to meet the triple constraints as well as the expected goals and benefit.

Ndungu and Karugu (2019) conducted a study on the Influence of community participation in completion of development projects; a case of Korogocho slums, Nairobi County. The study found that project initiation phase influenced project implementation through stakeholder attendance of project initiation meetings and participation in the project initiation phase. According to Staples, (2019) project initiation practices play an essential role in helping guide stakeholders, sponsors, teams, and the project manager through other project phases. The project management institutes estimate that as of 2017, organizations were wasting an average of $97 million for every $1 billion invested, due to poor project performance (Staples, 2019).

According to Matu et al., (2020) many project failures can be traced back to mistakes or omissions that were done during the initiation phase. According to Tereso et al., (2019) project initiation practices include; definition of the problem, identification of the project timeline, identification of the project stakeholders both internal and external stakeholders, determination of the steps to take to achieve the project objectives, scope

definition, project team selection, carrying out a project feasibility study and project risk identification.

This study focused on four project initiation practices; risk identification, scope definition, project feasibility study and project team selection. The choice of the four variables was justified by looking at the previous studies that had be conducted on project initiation practices and project performance. According to Bahadorestani et al. (2020) who conducted a meta-analysis to explain the role of project initiation in project performance found out that project feasibility study is an important aspect of project initiation aspect that impact on the project performance.

Mkuni (2016), also conducted a study on the role of project initiation on completion of projects and established that scope definition, and risk identification were key project initiation aspects that influenced project performance. According to Safapour et al. (2019) successful projects are usually the result of careful planning and the talent and collaboration of a project's team members. The choice of the moderating variable was justified since according to Mwakajo and Kidombo, (2017) resource mobilization has an influence on project performance and it is very essential during project commencement hence the choice of resource mobilization to moderate the relationship between project initiation practices and project performance was a good choice.

1.1.2 Construction Projects

The construction industry has been growing at steady pace globally. According to Emmett and Langston (2019), the global construction grows at a rate of USD 0.3 trillion annually. Hence the growth is projected at USD 10.3 trillion in 2018 compared to USD 7.4 Trillion in 2010. Globally the construction industry suffers from many problems and complex issues in performance such as cost, time and safety.

While in many locations around the world collapsing of construction projects have been caused by terrorist attacks, gas leak explosions, earthquakes and global environmental changes Bank, In Africa and in many developing countries the collapsing of construction projects has been attributed to week foundations,

substandard construction materials, poor material mixing by construction workers and poor testing of building strength (Safapour et al., 2019).

The construction industry in Kenya is driven primarily by two key infrastructure sectors; transportation and building or housing. In Kenya the construction industry is growing and is a crucial sector for the growth of the economy. According to the report of Kenya National Bureau of statistics (KNBS, 2018) and the Kenya Economic Outlook (2018) the construction sector grew by 8.6% in 2017. In the same period, the Gross Fixed Capital Formation increased by 15.9% for dwellings and 13.6% for other buildings other than dwellings respectively compared to 2016. According to Kibaara (2018), the national construction authority predicted the growth of construction firms in terms of capability and capacity to efficiently execute the large-scale projects anticipated within the vision 2030 national development plan. However, the construction Projects undertaken in Kenya are substandard and only the contractors reap heavily from the shoddy work they do and most people are not pleased with the quality of the projects done (Oyalo & Bwisa, 2018).

The number of construction projects collapsing have been increasing for instance a six-storey building collapsed in Tassia in Embakasi in 2019, a road collapsed in Nakuru county in May 2020, Sigiri Bridge collapsed in Budalangi in 2017, in April 2015 a building collapsed in Embakasi. Any time there is a problem of construction projects failure, abandonment, or collapse, everyone looks up to the engineers who accept the blame but could do not un- ravage the menace(Bawane, 2017). However, the answer to project success, failure, abandonment of construction projects lies in efficient project initiation practices (Damoah & Kumi, 2018).

A lot of questions have been raised concerning the poor performance of construction projects in Kenya. Hence this study aimed at studying the relationship between project initiation practices and performance of government construction projects in Kenya. To establish whether good project initiation practices can be the solution to the poor performance of construction projects in Kenya.

6

1.2. Statement of the Problem

The construction industry has experienced exponential growth and it has a big impact on the economy of all countries (Emmett & Langston, 2019). In spite of the high importance of the sector, construction projects failures are increasingly reported around the globe with 30% of projects been cancelled midstream, while 50% of the completed projects end up to 190% over budget and 220% late (Ballesteros-Perez et al., 2020).

In Kenya the construction industry has been faced by enormous challenges in quality assurance because of the alarming rate of collapsing structures due to poor workmanship, unqualified project team and use of substandard materials (Building Audit report, 2015). According to Ngunjiri, (2018) most construction projects are started by political elite hence no time is taken to analyse the project nor do a feasibility study. Instead, the projects are pushed by politicians for their political gain thereby undermining their quality. According to NCA report of 2018, 66% of the construction projects collapse after completion while 34% of the projects collapse during construction. Government projects suffer heavily in cost and time overruns compared with privately funded projects in management and project delivery. The Africa construction trend report (2017) by Deloitte, indicated that 87 per cent of Kenya's public sector projects experience time delays while 48 per cent suffer cost overruns. According to the economic survey conducted by Kenya National Bureau of statistics (2018) the value of construction projects completed in 2018 decreased from ksh 3.8 billion in 2017 to 2.3 billion and 52% of the projects were not completed within the projected budget and 33% were not completed within the planned schedule while 22% of the projects had errors identified during the project initiation phase yet they were implemented. The underperformance of government projects represents a significant and substantially avoidable loss of economic value and stakeholder dissatisfaction (Makokha, 2020).

Mkuni, (2016) conducted a study on the role of project initiation on completion of projects and established that scope definition, and risk identification were key project initiation aspects that influenced project performance. Moreover, the concept of

resource mobilization has been left out in most of the studies despite evidence by Lynn (2019) and Kpognon (2022) showing that resources mobilization is an essential determinant of the extent to which project initiation effectively contributes to the success of the project. Similarly, Bierbaum and Schmitt (2022) alluded that project initiation can be intensive in enhancing project performance if the appropriate resources are put in place through a project management team that is capable of mobilizing these resources. Recent studies however have not featured-in the aspect of resource mobilization. The current study, therefore, sought to fill these gaps by examining the relationship between project initiation practices on performance of government construction projects in Kenya and the moderating effect of resource mobilization.

1.3 Objectives of the Study

1.3.1 General Objective

The general objective of the study was to examine the relationship between project initiation practices and performance of government construction projects in Kenya.

1.3.2 Specific Objectives

i. To establish the relationship between risk identification and performance of government construction projects in Kenya.

ii. To determine the relationship between scope definition and performance of government construction projects in Kenya.

iii. To assess the relationship between project feasibility study and performance of government construction projects in Kenya.

iv. To establish the relationship between project team selection and performance of government construction projects in Kenya.

v. To examine the moderating effect of the resource mobilization on the relationship between project initiation practices and performance of government construction projects in Kenya.

1.4. Hypotheses of the Study

The study seeks to be guided by the following statistical hypotheses:

H_{01}: There is no significant relationship between risk identification and performance of government construction projects in Kenya.

H_{02}: There is no relationship between scope definition and performance of government construction projects in Kenya.

H_{03}: There no significant relationship between project feasibility study and performance of government construction projects in Kenya.

H_{04}: There is no relationship between project team selection and performance of government construction projects in Kenya.

H_{05}: Resource mobilization does not moderate the relationship between project initiation practices and performance of government construction projects in Kenya.

1.5 Justification of the Study

The study is important especially in the face of the implementation "big four" agenda that include construction projects. The study was seeking to establish how project initiation practices influence the performance of government construction projects in Kenya. The study informed various stakeholders on the appropriate project initiations practices and their impact on project performance. The beneficiaries of this study were the, Ministry of Transport, Infrastructure, Housing and Urban Development, county government, National Housing Corporation and researchers and scholars.

1.5.1 Ministry of Transport, Infrastructure, Housing and Urban Development

The National government of Kenya is determined to transform the country into a newly industrializing middle- income economy providing high – quality life to all its citizens by the year 2030 and the construction industry will be a key contributor to economic growth. Hence the findings of this study provided the government with insights on

project initiation practices and their impact on project performance. Hence this study enabled the government to position itself and establish ways in which it can effectively initiate construction projects in Kenya.

1.5.2. County Governments

This study gave insight to the project initiation practices that affect performance of government construction projects in Kenya. The county governments are also tasked with the responsibility of initiating construction projects in the counties under the devolved government. Hence the county governments can use the findings of the study to improve on the critical project initiation areas that hinder performance of projects. To this end, the findings of this study assisted the county government in identifying the appropriate initiation practices and how such practices impact on the project performance.

1.5.3 Researchers and Scholars

The findings of the study may be used as a source of reference for other researchers. In additional academic researchers, may need the study findings to stimulate further research in this area and as such form a basis of good background for further researches. Researchers benefited from both the theoretical literature review and the findings of this study which aimed at examining the influence of project initiation practices on performance of government construction projects in Kenya.

1.5.4. National Housing Corporation

This study provided necessary information to the National Housing corporation on the project initiation practices that affect performance of housing projects and give recommendation on the ways to initiate project successfully hence the National Housing corporation can use the findings of the study to improve the way it initiates housing projects. The National Construction Authority can utilize the findings from the study to improve on the framework for policy formulation and regulation.

1.6 Scope of the Study

The study aimed at examining the relationship between project initiation practices and performance of government construction projects in Kenya. The study focused on government construction projects since data is readily available and the government projects are more prone to mismanagement (Robert, 2021). The study focused on the Ministry of Transport, Infrastructure, Housing and Urban development which is responsible for policy initiatives and undertaking construction projects with respect to roads, aviation, maritime, rail, housing and urban development. The study focused on the construction projects undertaken by the key government agencies within the Ministry of Transport, Infrastructure Housing and Urban Development. The key government agencies within the ministry include; Kenya Railway Corporation, Kenya Ports Authority, Kenya Airport Authority, Kenya Ferry Services, Kenya Rural Roads Authority, Kenya Urban Roads Authority, Kenya National Highway Authority and National Housing Corporation. The target population was 320 construction projects that had been implemented from 2017 to 2021 by the key agencies in the Ministry of Transport, Infrastructure, Housing and Urban development.

Conceptually, there are numerous project initiation practices that are considered important but the study was restricted to risk identification, project scope definition, project team selection, project feasibility study and the moderating role of level of resource mobilization. The study was conducted during the academic year 2019/2020 and 2020/2022.

1.7 Limitations of the Study

The study used the questionnaires. The problem is that the respondents may have failed to respond to the questionnaires effectively by giving false information that would have affected the results. A letter from the university was included to assure respondents that the data was for academic purposes. The limitation of the respondents not giving accurate information due to respondents 'divided attention to questionnaires and the desire to safeguard the reputation of the organization was delimited by informing the respondents of the magnitude and importance of the data to be collected as well as the ethical requirements expected of them upon consenting to participate in

the study. It was difficult for the researcher to access some records that had factual information on the government construction projects. This led to over reliance on the respondent's feedback but the researcher encouraged the respondents to respond to the open ended questions which at least gave factual information and formed a basis for triangulation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covered the theories that were used in the study. The theories reviewed were linked based on their relevance to the study. This chapter also presented the conceptual framework and the operationalization of the study variables. Empirical studies on the subject were reviewed and critique of the existing studies was conducted. A summary of literature was also done as well as the study research gaps.

2.2 Theoretical Review

According to Bwisa, (2015) a framework is a logical structure of meaning that guides the development of a study by providing the shape and support while a theoretical framework is a group of ideas providing guidance to a research project as it interrelates theories involved in the research question. A theory is set of constructs, prepositions and definition of an organized view of phenomena by pointing the relationship among variables with the purpose of examining the phenomena. The theoretical foundation for this study was informed by; prospect theory, theory of Constraints, theory of change and project management competency theory.

2.2.1. Prospect Theory

The prospect theory was developed by Kahneman and Tversky in 1979. It is helpful in making decision in the project environment especially risky conditions (Scholten & Read, 2014). The idea of prospect theory is that people make assessments based on what they may gain or lose as the result of making a choice. It is designed to aid organizations and individuals to understand, explain and predict choices in a world of uncertainty.

It explains how choices are framed and evaluated in the decision-making process. It focuses on two parts of decision making, the framing phase and the evaluation phase (Clark & Lisowski, 2017). The framing phase describes how a choice can be affected

by the way it is presented to a decision maker. The evaluation phase consists of two parts, the value function and the weighing function, where the value function is defined in terms of gains and losses relative to the reference point. According to prospect theory, the possibility of losing an existing position will generate a level of resistance that will outweigh the energy and resources a person might expend in order to gain a new position. It states that when people are faced with a risk in which they have limited information, and do not apply rigorous analytical processes, their choices will often be driven by how the information about the situation is framed either by themselves or others (Gou et al., 2021).

This theory emphasis on providing information regarding the risks facing projects since the project stakeholders will make decisions based on the information they have this can be achieved by identify risks before a project commences. Risk identification is the process of determining risks that could hypothetically prevent the project, innovativeness or investment from accomplishing its objectives (Tamošaitienė, 2018). Therefore, risk identification is important in managing projects that are exposed to risks in order to ensure that the objectives of the projects are achieved within the constraints of the project. The prospect theory is significant in risk identification. This theory was helpful in explaining the influence of risk identification on project performance.

2.2.2 Theory of Constraints

The theory of constraints was developed by Guru Eliyahu M. Goldratt in 1984. Eliyahu developed the theory of constraints to help organizations decide what to change, find a desirable new condition and how to trigger the change.

It is used to establish how managers can effectively manage organizations based on the assumptions of system thinking and constraint management (Quesado & Branco, 2017). The theory assume that people can think, they are good and systems are simple (Kweyu, 2013). It is based on five steps which include: identifying the system's constraints that limit progress toward the goal, exploiting the most important constraint, subordinating everything else to the decision made by managing the system's policies, processes and resources to support the decision, elevating the

14

constraint by adding capacity or changing the status of the original resources to increase the overall output of the constraining task or activity, and going back to step one and identify the next most important constraint (Gupta & Boyd, 2008).

Projects are difficult to manage because they involve uncertainty, and involve three different and opposing commitments i.e. due date, budget, and content (Gupta & Boyd, 2008). Triple constraints criteria (time, scope and cost) in project management have been accepted as a measure of project success. The constraints of projects are; scope (a measure of quality), cost and time - have their respective effects on projects' performance but since these elements have some correlation, one constraint bears an effect on the other two, eventually affecting projects deliverables to a greater extent (Orouji, 2016).

This theory was useful in this study since it focuses on the project success parameters; time, cost, scope as constraints around which the project management organization is structured. The theory is linked to the scope definition objective since it explains the importance of considering scope in order to achieve project success. Project managers should take time to define project scope by defining project boundaries, listing the features and concluding the set of project deliverables. According to Verzuh, (2015) inadequate definition of the scope at the start of the project led to project failure. A properly defined and managed scope leads to delivering a quality product, in agreed cost and within specified schedules to the stake-holders.

2.2.3 Theory of Change in Project Management

Theory of Change traces its origin from the 1950s with Kirkpatrick's famous model of learning and has since undergone major transformations in the way it is used. The Kirkpatrick model was used to examine the impact of training on students (Waddell et al., 2015). In its early conceptualization in 1995, Weiss defined the theory of change as a "theory of how and why it works". It is based on the approach of planning, implementing or evaluating change at an individual, organization or community level (Ruesga, 2010). The theory of change articulates explicitly how a project or initiative is intended to achieve outcomes through actions, while considering its context.

15

The theory of change is used to articulate how expected outcomes will be achieved by exploring the real-world setting in which the project is being executed, the starting situation, and risks or opportunities that may influence achieving change, the actions to be taken and the steps of change expected to take place. It can be developed and used at various points in the lifecycle of a project from planning an idea through the implementation, delivery and review (Zheng & de Carvalho, 2016).

In this study the theory of change was used to exemplify the concept of project feasibility study on project performance. It explains the significance of a feasibility study and how it can improve planning and prevent the project from drifting, and highlight gaps in knowledge or thinking that is lacking in clarity.

The theory of change provides and understanding of why a project does or does not work and allows a project manager see where in the chain things are not working. The focus of a project feasibility study is to determine if a proposed project will work or not or if the project will be affected by changes in the project environment. The goal of a feasibility study is to emphasize on potential problems that can occur if one pursues a project and determine if, after considering all significant factors, the project is a good idea.

2.2.4 Project Management Competency Theory

The theory was established by McClelland and McBer in the 1980s. According to this theory competency as the underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation. The theory's objective and goal was to explain the roles of competency in project management and its effects on projects performance. Project management competency was necessary skills, knowledge, and attitudes that had effect to the activity and was to be measured by comparing with the set standards (PMI, 2017).

According to Lindeman and Sarosi (2020) project implementers had to be competent in their duties to enhance successful performance in projects. According to Njue (2021), project managers and project team members were needed to have ability to choose the project implementation tools, techniques and capabilities that facilitated the

performance of the projects, the project team had to apply knowledge, skills and management techniques successfully to achieve the set goals of the projects (Ochenge, 2018). It is critical for project managers to identify the key skills that are need by project team before they select them to work on a project. The theory is relevant on the association between competence of project team and performance of projects. This theory will be linked to the objective of project team selection since it emphasizes on the need to identifying the key competencies needed by project team to enhance project performance. According to(Wu et al., 2017) the project team has an impact on project success since the skills, ability and experiences have a positive and significant influence on project performance. In additional an effective project team and the communication and collaboration of all project participants, and can also promotes the owners to improve project management capacity and define a clear and reasonable project goal.

2.2.5 Resource Based Theory

The resource based theory was established by Penrose's in the year 1959 when he viewed organization as a pool of resources. Resources in a firm can be either internal or external to the firm and may be acquired or already owned by the firm (Arbab Kash et al. 2014). Penrose (2009), proposed a model on the effective management of firms' resources, diversification strategy, and productive opportunities. The Resource-based View (RBV) is a strategic management theory that is widely used in project management, it examines how resources can drive competitive advantage. Competitive advantage is the ability to create more value than rivals, and therefore generate higher returns on investment. Sustainable competitive advantage requires enduring benefits through capabilities that are not easily imitated (Killen et al., 2012). Project management resources and capabilities that have been customized to a specific environment and developed over time are not easily imitated. Such capabilities are constantly associated with better performance, leading to viewing PM as strategic organizational capabilities that can provide enduring benefits. Examples of tangible PM resources include methodologies and practices (know what), while intangible resources include tacit knowledge sharing process and facilitation (know how). Following the Resource-based View of the firm concept, the intangible resources are

17

more likely to satisfy the requirement of being rare and inimitable (Killen et al., 2012). The theory was subsequently proper for this research since it assisted in recognizing how vital resources are properly planned, acquired, and motivated. The theory was linked to the moderating role of resource mobilization on project initiation and project performance.

2.2.6 Performance Theory

The Theory of Performance traces its origin in a variety of fields but Victor Turner (1988) and Richard Schechner (1985) are the theorists most associated with the theory. Elger (2015) argued that the Theory of Performance (ToP) makes and portrays six foundational approaches used to explain performance and performance improvements. The extent of performance is based on six factors: level of knowledge, context, levels of skills, and level of identity, personal factors and fixed factors.

The theory of performance is considered relevant in understanding the influence of project initiation on performance of government construction projects and consequently providing the theoretical background for this study. Performance theory establishes stories to a particular scenario and rewards a narrator who claims the responsibility for the performance. Each performance relies on a player's claim of responsibility for the emergent event (Hou et al., 2014). Project performance is critical, especially in the construction sector, because this industry is among the critical contributors to the country's economy and is at the core of fulfilling the people's basic needs of shelter (Kihoro & Waiganjo, 2015). Successful construction projects usually attain specified performance criteria such as timely completion, under budget, and meets the quality needs of the different stakeholders (Akrofi, 2017). The basic tenet of the theory of performance is that to perform, is to produce valued or desired results

2.3 Conceptual Framework

According to Gregory (2020), a conceptual framework is a system of concepts, assumptions, expectations, beliefs and theories that support and inform research. A conceptual framework shows the relationship between independent and dependent variables under investigation. For the purpose of this study the key independent

variable was project initiation practices represented by risk identification, project scope definition, and feasibility study and project team selection while the dependent variable was project performance. Resource mobilization was introduced as a moderating variable in this study.

Risk Identification • Risk reporting • Risk mitigation • Risk allocation

Scope Definition • Project objectives • Scope creep mitigation • Project deliverables

Performance of construction projects ▪ Completion rate ▪ Conformance to budget ▪ Adherence to the quality standards

Dependent Variable

Feasibility study • Technical • Economic • Legal

Project Team selection • Timely identification • Roles and responsibilities • Experience

Resource mobilization • Financial • Time • Technology

Independent Variables   **Moderating Variable**

Figure 2.1: Conceptual Framework

2.3.1 Risk Identification

A risk is an uncertain event that may have a positive or negative effect on project performance and success (Rodríguez et al., 2016). Projects are always prone to uncertainties and risks and failure to effectively identify the associated risks appropriately results to failure of the projects in terms of delay in completion (El-Sayegh et al., 2021). Risk management process is effective when it done at the very beginning of a project's life cycle to take into account the process of participation of all stakeholders in this process (Kotlarsky et al., 2020). According to Cui et al. (2020) identification of risks is the only way through which risks can be mitigated hence ensuring delivery of quality projects at a cheaper costs and within the set timelines. The best way of initiating a project and ensuring that the project runs to success is by identifying risks that may arise in the project (Renault et al., 2020). Risk identification is a crucial step in managing projects especially during the project initiation phases since it forms the bases for risk management process for the entire project (Lagat & Tenai, 2017). Risk identification process attempts to identify the source and type of risks, it involves the recognition of potential risk event conditions in the projects and the clarification of risk responsibilities (Bahamid et al., 2019).

Risk reporting is the vehicle for communicating the value that the risk function brings to an organization. It allows for proactive risk management as organizations identify and escalate issues either as they arise, or before they are realized to take a proactive approach to managing risks (Hemrit, 2018). It provides a way of collaborating and updating stakeholders, both inside and outside the organization, ensuring the right risk information is provided to the right people, at the right level and at the right time. According to Urbański et al. (2019), reporting risks is an essential risk identification aspect that ensures the risks are properly noted on time, and a record kept for making effective decisions on how to address and mitigate the risks.

Risk reporting involves the systematic gathering, analysis, and dissemination of information regarding identified risks within an organization. This component is essential for ensuring that stakeholders are informed about the nature, magnitude, and potential impacts of risks on the organization's objectives (Zhang, *et al*, 2015).

Effective risk reporting facilitates decision-making processes by providing stakeholders with timely and accurate information to assess the level of risk exposure and determine appropriate responses. In practice, risk reporting may involve the use of various tools and techniques, such as risk registers, risk matrices, and risk heat maps, to categorize and prioritize risks based on their likelihood and potential impact. Additionally, risk reporting mechanisms should be tailored to the needs of different stakeholders, ensuring that information is presented in a clear and concise manner to facilitate understanding and action. Regular and transparent communication is key to effective risk reporting, fostering a culture of risk awareness and accountability within the organization. By providing stakeholders with relevant information about identified risks, organizations can proactively address potential threats and capitalize on opportunities to achieve their objectives while minimizing adverse impacts (Maina & Mungai, 2023).

Risk mitigation is all about understanding those risks that can impact the objectives of the projects, and taking the appropriate steps to reduce the risks to an acceptable level (Hillson, 2015).it involves the actions be taken towards the identified risks and threats. Many construction projects fail because organizations assume that all the projects would succeed and they therefore do not identify, analyze, and provide mitigation or contingencies for the risk elements involved in the project. Pressure is exerted on project managers to minimize the chance of project failure. This increasing pressure for performance suggests that it is prudent for anyone involved in a project to concern about the associated risks and how they can be effectively managed. (Maina, & Mungai, 2023). Risk mitigation involves the development and implementation of strategies to reduce the likelihood or impact of identified risks. This component aims to proactively manage risks by either eliminating, reducing, transferring, or accepting them, depending on the organization's risk tolerance and objectives (Hemrit, 2018). Effective risk mitigation strategies should be informed by a thorough understanding of the root causes and potential consequences of identified risks. This may involve conducting risk assessments, scenario analysis, or simulation exercises to evaluate the effectiveness of different mitigation options and identify the most appropriate course of action (Kinyua *et al.,* 2015). Continuous monitoring and review are essential aspects of risk mitigation, allowing organizations to assess the effectiveness of implemented

strategies and make adjustments as necessary. By proactively managing risks, organizations can enhance their resilience and adaptability in the face of uncertainty, ultimately improving their ability to achieve their objectives (Urbański *et al*., 2019).

Risk allocation involves the assignment of responsibility for managing identified risks to appropriate parties within an organization. This component seeks to ensure that risks are effectively managed at the operational level, aligning with the organization's risk appetite and objectives. In practice, risk allocation may involve defining clear roles and responsibilities for key stakeholders, establishing accountability mechanisms, and allocating resources to support risk management activities. This may include appointing risk owners or establishing risk management committees tasked with overseeing the implementation of risk mitigation strategies and monitoring key risk indicators) (Simon & Mutiso, 2021). Effective risk allocation requires collaboration and coordination across different functions and levels of the organization, ensuring that risks are properly identified, assessed, and addressed within relevant business processes and activities. Additionally, organizations should foster a culture of accountability and transparency, encouraging employees to take ownership of risks within their areas of responsibility and actively contribute to their management (Nawaz *et al*., 2019).

2.3.2. Scope Definition

Every project undertaken must have a specific scope, which includes the determination of the work that would be completed during the project's lifecycle (Harrison & Lock, 2017). In every project life cycle, the early definition of the scope of the project and getting the exact definition affects the project as a whole. Scope can be both in regard to a project or a product. Project scope is the work done to deliver a product, service or result with specified characteristics whereas product scope refers to characteristics and functions that characterize a product, service or result (Ngure, 2019). Scope definition is considered the vital part of documentation processing of defining a project as it sets the right guidelines to getting a project initiated. When a project is not defined properly there is a high tendency of the project failing to achieve any meaningful purpose (Abdilahi et al., 2020). According to Ogunberu et al., (2018) "once the project

scope is not properly defined at the beginning of projects, the likelihood of failure (lack of customer satisfaction) is high.

Project objectives articulate the specific outcomes or goals that the project aims to achieve within a defined timeframe and budget. These objectives provide the overarching direction and purpose for the project, guiding decision-making and resource allocation throughout its lifecycle. Clear and well-defined project objectives help stakeholders understand the project's scope and expectations, ensuring alignment with organizational goals and priorities (Tereso *et al*., 2019). Effective project objectives should be SMART: Specific, Measurable, Achievable, Relevant, and Time-bound (Nicholas & Chinedum, 2017). This ensures that objectives are clear, quantifiable, feasible, aligned with organizational objectives, and achievable within the project constraints. Stakeholder input and consensus are crucial in defining project objectives, as they provide valuable insights into stakeholders' needs, expectations, and success criteria. Regular review and validation of project objectives are essential to ensure that they remain relevant and aligned with changing project dynamics and stakeholder requirements. By establishing clear project objectives, project teams can focus their efforts on delivering value and achieving desired outcomes, ultimately increasing the project's chances of success (Fashina *et al*., 2020).

Scope creep refers to the gradual expansion or addition of project requirements, deliverables, or features beyond the initially defined scope. It often results from evolving stakeholder expectations, changing requirements, or unclear project boundaries. Scope creep can undermine project success by increasing project costs, delaying timelines, and jeopardizing quality. Scope creep mitigation involves proactive measures to prevent or minimize the impact of scope changes on the project's objectives, schedule, and budget (Fageha & Aibinu, 2017). This may include establishing robust change management processes, conducting thorough impact assessments before approving scope changes, and clearly documenting and communicating any deviations from the original scope baseline (Lukhele *et al*., 2021). Effective scope creep mitigation requires strong governance, stakeholder engagement, and communication throughout the project lifecycle. Project managers should actively manage stakeholder expectations, educate stakeholders about the implications of scope

23

changes, and negotiate trade-offs between scope, schedule, cost, and quality to maintain project alignment. Regular monitoring and control of project scope are essential to identify and address potential scope creep early. This may involve conducting periodic scope reviews, tracking scope changes against the baseline, and implementing corrective actions to mitigate any deviations. By proactively managing scope creep, project teams can maintain project focus, minimize risks, and increase the likelihood of achieving project objectives within the defined constraints (Ajmal *et al.*, 2019).

Project deliverables are the tangible outputs, products, or results that the project is expected to produce to fulfill its objectives and meet stakeholder needs. These deliverables define the tangible outcomes of the project and serve as the basis for assessing project progress and success (Verzuh, 2015). Defining clear and well-defined project deliverables is essential to ensure alignment with project objectives and stakeholder expectations. Deliverables should be specific, measurable, and verifiable, allowing stakeholders to assess their quality and completeness (Verzuh, 2015). Additionally, deliverables should be prioritized based on their importance to project success and stakeholder needs. Effective management of project deliverables involves establishing a structured approach to deliverable definition, development, and acceptance. This may include creating a deliverable hierarchy or work breakdown structure (WBS) to decompose project objectives into manageable components, defining acceptance criteria for each deliverable, and establishing mechanisms for stakeholder review and approval (Akhwaba, 2020).

2.3.3 Project Feasibility Study

According to Harrison and Lock, (2017a) feasibility study examines the practicability of a proposal, business venture or idea. The principal function of this is to determine if the project will continue or not. According to Mukherjee and Roy (2017), feasibility study helps in determining the viability of the project being proposed for execution so that only viable projects are selected for implementation to ensure desirable project performance. A project feasibility study should be undertaken by any organization whether public or private if it intends to undertake a project since it is easier to achieve

the project objectives if key issues involved in a project execution such as projects, technical, economical, legal and schedule requirements are addressed before commitment of any financial support to a project (Mwenda et al., 2018). Many of the projects or any kind of business fails to achieve this goal because they do not even begin with a feasibility study (Nicholas & Chinedum, 2017).

A feasibility study is the total of the actions you take and the questions you ask to determine whether an idea, thought or plan is likely to succeed. An effective study can guide you on whether you should move forward with your idea, refine it, or scrap it altogether and go back to the drawing board (Tereso et al., 2019). During feasibility study the economic and technical viability of idea is analyzed and proved which the core objective of feasibility study. The technical feasibility is focused on gaining an understanding of the present technical resources of the organization and their applicability to the expected needs of the proposed system. It is an evaluation of the hardware and software and how it meets the need of the proposed system (Nicholas & Chinedum, 2017).

According to Mukherjee and Roy (2017), during economic feasibility study the available resources set aside for executing the project are evaluated. Project economic feasibility studies the resources to be invested into the project are compared with the expected economic gains and projects whose expected project economic benefits exceed the resources to invest should be selected (Zhou et al., 2019). Legal feasibility study evaluates the extent a proposed project compliance with the existing national or international legal requirement (Abdollahbeigi et al., 2017).

According to Goel et al. (2020), feasibility studies are essential in determining the legal, technical and economic benefits of the project, thus ensuring the projects are implemented with the provided premises based on economy, technicality and legal framework. Saad Al-Sumaiti et al. (2020), on the other hand contends that the feasibility studies in any project are meant to ensure that the project does not face implementation challenges in the middle of the implementation, since this should derail of completely affect the continuity of the project. According to Mwazani (2018), just like any other business organization, construction projects need to carry out

feasibility studies to ensure their sustainability. Feasibility studies assists organizations to put all requirements needed in a project in a systematic manner for it to operate. It is used to convince financial institutions or investors that a given project in question is viable.

2.3.4. Project Team Selection

A project team is defined as a small or large number of people with complementary skills and committed to achieve the project objectives (Chan et al., 2021) . Project teams are individuals who perform defined, specialized tasks within a definite time period, and disband after the project ends. They have varied knowledge, expertise and experience and they must acquire pool vast amount of information across boundaries (Shastri et al., 2021). It is extremely important for project teams, regardless of their size, to maintain good performance for a project to be successfully completed. To maintain high performance team in projects, it is necessary to consider such imminent factors as: skills, experiences, interests, values, spirit of collaborations, sound behaviors, good leadership and continual improvement (Ogbu & Olatunde, 2019). According to Wu et al., (2019), the identification of appropriate team members and skills to be used in a project is essential in ensuring that the project is implemented as per the plan and that the skills and competencies available match the specification of the project. The selection of the project team is essential in determining the extent to which the project meets it mandate (He et al., 2019).

Timely identification of the project team involves proactively identifying and recruiting team members at the early stages of project initiation. This ensures that the project team is formed in a timely manner, allowing sufficient time for team members to familiarize themselves with the project objectives, requirements, and expectations. Key stakeholders involved in project team selection should collaborate to define the project's staffing needs based on its scope, complexity, and resource requirements. This may involve conducting a skills gap analysis to identify the specific expertise and competencies required to successfully deliver the project. Project managers should also consider factors such as team size, diversity, and availability when identifying potential team members. This may include assessing existing resources within the

organization, recruiting external talent, or leveraging cross-functional teams to fill skill gaps and ensure adequate project staffing (Maendo *et al*., 2018).

Roles and responsibilities define the specific functions, tasks, and accountabilities of each team member within the project. Clarifying roles and responsibilities is essential for promoting accountability, collaboration, and effective communication within the project team. Project managers should work closely with key stakeholders to define clear role descriptions for each team member based on their skills, expertise, and experience. This may involve creating an organizational chart or RACI matrix (Responsible, Accountable, Consulted, Informed) to document roles and responsibilities and ensure alignment with project objectives. Effective role definition also involves establishing communication channels and escalation paths to facilitate information flow and decision-making within the project team. This ensures that team members understand their roles, expectations, and dependencies, reducing the likelihood of misunderstandings or conflicts during project execution (Shastri *et al*., 2021).

Experience is a critical factor in project team selection, as it directly influences the team's ability to successfully deliver the project objectives. Project managers should consider the relevant experience, expertise, and track record of potential team members when assembling the project team (He *et al*., 2019). Experience may include domain-specific knowledge, technical skills, project management experience, or industry certifications relevant to the project's scope and objectives. Project managers should assess each team member's past performance on similar projects, their ability to work collaboratively in a team environment, and their willingness to learn and adapt to new challenges (Sankaran *et al.,* 2020). In addition to technical expertise, project managers should also consider softer skills such as communication, leadership, problem-solving, and conflict resolution when evaluating potential team members. A diverse team with a mix of complementary skills and perspectives can enhance creativity, innovation, and resilience in addressing project challenges (Mathu2015).

2.3.5 Resource Mobilization

A resource is any physical or non- physical entity of limited availability that needs to be utilized to obtain a benefit. Resources at the disposal of a project can either be physical such as machinery and equipment or intangible such as trade mark, intellectual property and processes. Adequate use of different resources can make a firm complete a project within the stipulated time and reduce the cost overruns (Robert, 2021). Resources can either make or break a project; they have therefore to be used efficiently and effectively. The main reason behind this is that the resources are hard to obtain, expensive or even at times both (Collins & James, 2018). Resource mobilization refers to all activities undertaken by an organization to ensure supply of resources such as financial, human, and technological resources which are sufficient to maintain operations which aim to attain the organization's mission (Ndetaulwa, 2019).

Project resource mobilization is the identification of financial, human, physical and technical resources and organization of these resources in a way that leads to successfully successful execution of a project (Densford et al., 2018). According to Danes (2018) resource mobilization refers to all activities involved in securing new and additional resources for the organization. It also involves making better use of, and maximizing, existing resources.

According to Tsuma et al. (2020), time is a critical factor in projects that require to be effectively managed for better and successful completion of the projects. González-Cacheda and Outeda, (2021) further stated that there is need for effective management of time as one of the resources and inputs for the project. Financial resources are essential in running a project to success and it is essential in meet the project objectives (Umulisa et al., 2015). Financial resources are the funds required by project contractors to buy the equipment's and machineries that are required to undertake construction projects and meet other expenses related to the project such as salaries and wages for the workers and cost of fueling the vehicles (Maendo et al., 2018). According to Maendo et al. (2018) project performance can be improved significantly using modern equipment to prevent projects delays. Technology is a critical resource in the modern

era that creates a more effective framework for project operations (Pan & Zhang, 2021). Glyptis et al., (2020) in Europe asserted that some of the challenges that led to poor performance of construction projects could be addressed through use of technological solutions. The use of modern techniques in the implementation of projects can result in high quality projects and reduction in the time span of construction projects. According to Mwakajo and Kidombo (2017) resource mobilization has an influence on project performance and it is very essential during project commencement hence the choice of resource mobilization to moderate the relationship between project initiation practices and project performance was a good choice. The level of resource mobilization moderates the relationship between project initiation practices and performance. While initiation practices may be well handled, the performance can only result if the available resources are enough to implement the project. Hence, mobilizing all types of resources is important for the project to be realized.

2.3.6. Performance of Construction Projects

Project performance is a subject of utmost concern to most stakeholders in any project. The main expectation of many stakeholders from projects is their performance in terms of achievement of objectives. Satisfactory achievement of set objectives is what makes a project successful (Muchelule, 2018). According to Nguyen and Watanabe (2017), the measures of project performance should include the project completion time, the completion of the project within the approved budget , efficiency , effectiveness , meeting the stakeholders expectation , with minimum conflicts and disputes . However according to Kerzner (2019), projects may be completed within their targeted time, cost and scope criteria but still be classified as failures. Therefore, it becomes necessary to consider failure beyond these criteria and include targets such as the aspiration of stakeholders, the benefits accruing to society or project organization among criteria for determining project failure.

Project performance can be explained using "two success concepts" (project management success and product success. Project management success focuses upon the fruitful accomplishment of the project time, cost and quality, which can be measured in term of meeting the project budget, schedule, and conformance to

functional and technical specifications respectively. Product success deals with the effects of the project's final product with three key components which are; to satisfy the project goal, purpose and stakeholders (Turner, 2020). According to Kerzner (2018), project performance is defined as a project that meets its objectives under budget and under schedule. This assessment criterion has remained as the most common measure in many industries.

But for a development project, success goes beyond meeting schedule and budget goals, it includes delivering the benefits and meeting expectations of beneficiaries, stakeholders, donors or funding agencies. The performance of a project is considered good if the project is completed within the schedule, within the budget, achieves the set goals and ensures stakeholders satisfaction (Gichamba & Kithinji, 2019). Project performance measurement is crucial in managing projects as it enables the project manager to establish challenges in budget and scope in time and devise proper mechanisms that address these challenges (Yeung et al., 2017).

2.4 Empirical Literature Review

Empirical research is a way of gaining knowledge by means of direct and indirect observation or experience. The study will give the empirical review of how risk identification, scope definition, project feasibility study, project team selection and the moderating influence of level of resource mobilization on performance of projects.

2.4.1 Risk Identification and Performance

Kinyua et al. (2015) carried a research on Effect of risk identification on project performance of small and medium information communication technology enterprises in Nairobi, Kenya. The study adopted a descriptive research design; the target population was SMEs in Nairobi. A random sampling technique was adopted and primary data was collected using semi- structured questionnaire. The study established that there exist a positive significant impact of project risk identification and performance of SME in ICT through risk registration, use of checklist, risk controls and screening of project risks. The study also established that risk identification and

project performance had a positive correlation since risk identification enables organizations to establish appropriate mitigation measures (Kinyua et al., 2015).

Mutua (2020), conducted a study on the effects of project risk identification on the performance of core banking systems in commercial Banks of Kenya. The study adopted a descriptive research design. The study conducted a census of 80 respondents. The collected data were quantitatively analyzed using descriptive statistics and multiple regression analysis. The study concluded that identifying risk enables full risk analysis to be done and risk to be addressed and the project managers qualify risk based on likelihood and impact.

Ndambiri and Kimutai, (2020) conducted a study on risk identification and performance of health systems digitalization projects in public hospitals in Nyeri County, Kenya. The target population for the study was all the level five hospitals in Kenya. The study adopted descriptive research design, primary data was collected using semi structured questionnaire and data was analyzed using both descriptive and inferential statistics. The study findings established risk management had a strong positive significant correlation with project performance. The study also established that project risk identification strongly and positively influences project performance explained by budget, scope, schedule customer metrics and learning and growth measures.

Tworek and Myrczek (2015) study examined the methods of risk identification in companies' investment projects. The study exclusively dealt with the methodological aspects of risk identification in investment projects carried out by companies carried out in 25, out of 100, leading construction and assembly companies in Poland. The research was conducted in the third quarter of 2009. The study found that effective identification of the effects of the risk is especially vital as it guarantees increasingly compelling assurance against risks.

Conversely, Gitau, (2015) explored the effects of risk management at project planning phase on performance of construction projects in Rwanda. The study used both qualitative and quantitative methods of data collection. The data was processed using SPSS. Correlation analysis was used to analyze the relationships between the

independent and dependent variables. The findings indicated that risk management practices at planning stage influenced project performance.

2.4.2 Scope Definition and Performance

Banda and Pretorius (2016) conducted a study on scope definition and performance of development projects in Malawi. The study employed mixed methods. 12 projects were sampled using purposive sampling. Interview schedules and questionnaires were used to obtain data. The study findings revealed that there was a significant correlation between scope definition and Successful rollout of rural roads construction projects in Malawi. Well-defined projects recorded good performance and poorly-defined projects showed poor performance.

Mirza et al. (2013) analyzed the Significance of scope in project success. The methodology used entailed review of existing literature. According to the study, many projects start with good ideas, huge investments and great efforts. However, most of them do not achieve much success. A major contribution to unsuccessful projects is the lack of understanding or defining project and product scope at the start of the project. A properly defined and managed scope leads to delivering a quality product, in agreed cost and within specified schedules to the stake-holders. The study concluded that a better appreciation of the distinction between project and product scope can bring a higher possibility of project success.

Fageha and Aibinu (2017) researched on managing project scope definition to improve stakeholders' participation and enhance project outcome. They defined Project scope definition as the process whereby a project is defined and prepared for execution. The research was carried using a mixed method (quantitative and qualitative) approach. It was conducted in three main phases. Phase one studied the relationships and interactions among the project definition elements. The analysis was conducted using two quantitative techniques: Interpretive Structural Modeling (ISM) and Analytical Network Process (ANP). The project scope definition was found to have a strong positive correlation with project success.

Njau and Ogolla (2021) studied Factors Influencing Project Scope Performance at Kenya National Youth Service Projects. The study adopted a descriptive research design to collect quantitative data. The target population was drawn from a population frame provided by the National Youth Service and consisted of project supervisors; project managers; staff and project beneficiaries. The target population for the study was 200 of which a sample of 60 respondents was picked for the study through stratified random sampling. A questionnaire was the instrument used for data collection. The researcher used IBM SPSS Statistics 20 to analyze quantitative data. Results of stepwise regression model showed that scope change as the key variable that best predicted Project Scope Performance. Hypothesis testing conducted at 95% confidence level confirmed that project manager competency and stakeholder management had insignificant influence of on Project Scope Performance, however scope change had significant influence on project scope performance.

Ogunberu et al. (2018) conducted a study on application of project scope management practices on project success among telecommunication organizations in Nigeria. The target population was twenty-five telecommunication firms in Nigeria were purposively visited. Primary data was collected using semi- structured questionnaire and it was analyzed using both descriptive and inferential statistics. The study established that the application of project scope management practices had a significantly impact on project success leading to fulfilled customer expectation and satisfaction; better resource allocation and timely project delivery.

2.4.3 Project Feasibility Study and Performance

Chillingworth (2015) studied project success and feasibility formula. The research adopted a qualitative approach and data was collected using document analysis, interviews, workshops case studies and observations. The study findings established that feasibility formula increases the number of successful projects by increasing value to the project organization and improving the competency level of project managers.

Mukherjee and Roy (2017) researched on Feasibility studies as an important aspect of project management. The study adopted a systematic review of existing literature. The various types of project feasibility discussed include technical, economic, legal,

operational and scheduling. Feasibility studies were found to be important for several reasons. Conduct a feasibility study is always important because of it gives a clear idea of the dreamed project. It helps to identify the valid and proper reason to select the project. With the support of feasibility study project teams' members become more focused. It helps to decision-making on the project. Additionally, it improves the achievement time by calculating several restrictions.

Saputra et al. (2018) conducted a study on the role of feasibility in achieving project success. The researcher utilized convenient sampling to collect 100 questionnaires from local NGOs staff in Mogadishu. Staffs from these NGOs were provided with main constructs which are measuring feasibility study, planning activity, HRM as well as project success. Using correlation and regression analyses, the study found that project feasibility studies had a positive relationship with project success.

Nicholas and Chinedum, (2017) conducted a study on the role of feasibility studies on project and organizational performance. The data was obtained from both primary and secondary sources. The target population of the study was 428 staff of Project Development Institute (PRODA) Enugu. The study adopted a stratified random sampling technique and to obtain the sample size the study used Taro Yamane's formulae to get a sample size of 207. The data was analyzed using statistical techniques such as frequencies, percentages and relative Importance Index. The study findings revealed that the conduct of feasibility studies to a very positive extent improves organizational performance, because it enables the organization to identify the flaws, challenges and unforeseen circumstances that might affect the progress of the organization with a view to taking appropriate preventive measures

2.4.4. Project Team Selection and Performance

Mughal (2013) conducted a study on the effectiveness of project teams and their impact on the performance of Saudi constructions projects. Primary data was collected using semi- structured questionnaire and the target population was 13 project teams from 13 different projects in large commercial buildings in Saudi Arabia. The studied established that there is a positive and high correlation between team effectiveness and project success. The study findings also indicated that team roles and responsibilities,

team goals and objectives and team leadership had a positive and significant effect on project success.

Nawaz et al. (2019) studied The Impact of Project Leadership and Team Work on Project Success. The study used purposive sampling technique. Questionnaires were used to gather data from employees from manufacturing organizations. Statistical tools like descriptive statistics, Pearson moment correlation and regression analysis were adopted to analyze direct consequence of independent variables on hooked on variables. Such as per hypothesis testing result shows that Project manager's leadership was positively correlated to project success and teamwork also have positive relationship with project success. Team performance has been established to have a direct relationship with the achievement of the project objective, cost, time and quality. This assertion was corroborated by earlier study that team effectiveness can be determined by examining the extent to which the team has achieved its priori objectives (Mbiru et al., 2021).

Alusa and Kariuki (2015) examined the project team management practices of high performance companies and found that attracting and selecting the right project team increases team productivity, boost organizational performance and contribute in reducing turnover. Kerzner (2022) pointed out that an effective hiring process ensures the presence of project team with the right qualifications, leading to production of quality products and consequently in increase of economic performance. This practice can ensure the right people, with the desirable characteristics and knowledge, are in the right place so they fit in the culture and climate of the project environment.

Mungeria (2012) examined professional teamwork and project performance in the building construction industry in Kenya. This study adopted a cross-sectional descriptive survey research design where the population for this study entailed all consultancy firms in the building construction industry registered with the Ministry of Public Works and Architectural Association of Kenya where 80 firms distributed to the different professional stakeholders were selected using proportionate stratified sampling method. Questionnaires were administered using drop and pick method. Data analysis involved reducing the accumulated data to a manageable size,

developing summaries and looking for patterns, and applying statistical techniques. The data gathered was edited, and randomly validated, the field results, through re-interviewing some of the respondents. The study concluded that, success of any activity done as a group relies on the leaders of the group. At the same time, team work is one of the most important aspects in any organization or company. This is because in a team, many skills are exhibited by various team members and at the same time, members complement each other

2.4.5 Resource Mobilization

Densford et al. (2018) conducted a study on effect of project resource mobilization on performance of road infrastructure projects constructed by local firms in Kenya. The study target population was forty-one road infrastructure projects undertaken by local firms. Data was analyzed using descriptive and inferential statistics. The study established that project resource mobilization had a significant effect on performance of road infrastructure projects. Financial, physical and technical resources also had a significant effect on performance of road infrastructure projects.

Ndayisaba and Mulyungi, (2018) study on Effect of Resources Management on Project Success Implementation in Rwanda. The study population comprised of 75 respondents from project implementers from Urwego bank and stakeholders in Muhanga district. A descriptive survey was design guided by a case study design. Data was collected using semi – structured questionnaire and data was analyzed using Statistical Package for Social Science. The study findings indicated that resource management had a positive and significant impact on project success. The study also established that human resources, financial and time resources affect project success.

Mwakajo and Kidombo (2017) conducted a study on factors influencing performance of road infrastructural projects in Embu County, Kenya. The study adopted a descriptive survey research design, a census was conducted and data was collected using semi- structured questionnaire. The study findings established that availability of financial resources affect project performance. The study recommended that before project commencement, the project team should try to mobilize the required resources, both financial and human resource to allow smooth flow of operations.

Umulisa et al. (2017) researched on effects of project resource planning practices on project performance of Agaseke project in Kigali, Rwanda. The research adopted a cross- section research design and purposive sampling technique was employed for a target group of 400 women of Agaseke projects in Kigali, Rwanda. Primary data was collected using semi – structured questionnaire and quantitative data was analyzed using SPSS version 16.0 while qualitative data was analyzed using narratives of themes and sub themes. The study findings established that there was a positive and significant relationship between human resources, financial resources, material and time resource planning practices and project performance.

2.4.6 Performance of Construction Projects

Justin et al., (2016) examined the role of project initiation on project success within Rwandan health services. The study hypothesized project initiation as the creation of sound guidelines for project management and determination of steps to follow in implementation of those projects. In this context, amongst the features that are identified include timelines and persons in charge of diverse steps in project management aspects. The study found a weak but positive correlational relationship between project initiation and project success.

Nkatha (2014) conducted a study on the Influence of community participation in completion of development projects; a case of Korogocho slums, Nairobi County. The study adopted a descriptive survey research design and a target population of 380 respondents derived from Korogocho dwellers. Data was collected using structured questionnaire. The study found that project initiation phase influenced project implementation through stakeholder attendance of project initiation meetings and participation in the project initiation phase.

In a research study aimed at determining the factors affecting the performance of constructions projects in the coastal region in Kenya. The study adopted a cross section research design, the target population was the construction projects in the Coastal region and data was collected using questionnaires using a simple random sampling technique. The study research findings established that projects were delayed and the actual cost of projects was more than the estimated cost due to political conditions and

delayed payments which results to unavailability of materials. The studied recommend that constructions organizations should have clear mission and vision to formulate, implement and evaluate project performance (Nyangwara & Datche, 2015).

Kihoro, (2015), conducted a study on factors affecting performance of projects in the construction industry in Kenya: a survey of gated communities in Nairobi County. The study adopted a cross-sectional survey design, the target population was construction firms in Kenya. Data was collected using Self-administered semi structured questionnaires. The study found that project planning, competence of the project manager and stakeholder management affect performance of construction projects.

Mwinzi and Moronge (2018) conducted a study on determinants of completion of housing projects in informal settlements in Nairobi city county, Kenya. The study adopted a descriptive survey research design, the target population was 100 housing projects in Nairobi County and data was collected using semi- structured questionnaire. The findings showed that project leadership, stakeholder involvement, project resources and project risk management affect completion of housing projects. The study recommended that adequate resource planning for the implementation of the project activities, organizations should identify and deal with risks proactively, stakeholder's involvement should be encouraged before commencement of projects to ensure successful completion rate of the housing projects.

2.5 Critique of Literature

Mwinzi and Moronge (2018) conducted a study on determinants of completion of housing projects in informal settlements in Nairobi city county, Kenya. The study variables were project leadership, stakeholder involvement and project risk management. This study however focused only on determinants of completion of housing projects without specifically pinpointing the way or how project initiation practices affect the performance of construction projects.

Nyakundi, (2015) examined the Influence of project Management Processes on Outcomes. From the findings, 67 % of the respondents indicated that project planning and initiation influenced project outcome to a very great extent. Despite the study

considering the importance of project initiation practices, it was not done comprehensive since it was only one of the objectives considered. Additionally, the various variable of project initiation such as risk management, scope definition, project feasibility and project team selection were not evaluated by this study.

Naeem et al. (2018) conducted a study on the Impact of Project Planning on Project Success with Mediating Role of Risk Management and Moderating Role of Organizational Culture. In order to analyze the relationship regression and correlation techniques were used, which indicated the positive impact of initiation practices on success. The results of study indicated significant impacts of initiation practices on project performance. However, the project was not based in Kenya and it did not consider specific elements of initiation practices. In addition, the study was not comprehensive in terms of Initiation practices as it was only one of the elements.

Nzioka (2017) studied the Role of Project Management initiation on Project Success in Kenya. The role of project management planning functions: Scope Planning, Cost Planning, Time Planning and Quality Planning on the success of Kenya Power Infrastructure Development Projects were deduced from the results of the study. However, the study did not consider the important initiation practices such as risk management and project feasibility study.

Mwakajo and Kidombo, (2017) conducted a study on factors influencing performance of road infrastructural projects in Embu County, Kenya. The study findings established that availability of financial resources affect project performance. The study recommended that before project commencement, the project team should try to mobilize the required resources, both financial and human resource to allow smooth flow of operations. Despite of the study acknowledging that resources mobilization has an influence on project performance and they are very essential during project commencement the study did not show the moderating relationship between project initiation practices and project performance.

2.6. Summary of Literature Reviewed

This chapter covered the theories underpinning the study which include the prospect theory, theory of constraints, theory of change, project competency theory and resource based theory. In addition, the study used a conceptual framework to illustrate the predicted relationships among the various variables being examined. From the gaps, it was evident that past studied used different variables or sub-variables of project initiation practices as those adopted by this study. Further, most of the reviewed literature did not take into account resource mobilization as the moderating variable. The methodologies in most studies are different adopting different research designs, populations and scopes.

The literature reviewed covered the aspects of risk identification, scope definition, project feasibility study, project team selection, resource mobilization as well as performance of construction projects in Kenya. The literature helped to bring out the relationship between each independent variable with the dependent variable, as well as the moderating influence of resource mobilization. Literature has shown that there is no agreement on the relationship between project initiation and performance. Some scholars reviewed posit that there is a positive influence of project initiation practices on performance while others give contradicting findings

2.7 Research Gaps

The research noted that several studies have been conducted on project initiation and project performance (Justin, Mbabazize & Zenon, 2016; Bahadorestani et al., 2020; Bucer & Englund, 2015; Mkuni, 2016). However, most of these studies have been conducted outside Kenya. This study aimed at filling the existing gap by studying the influence of project initiation practices and performance of construction projects in Kenya.

It is evident that most researchers in this subject area have concentrated on the project initiation phase as one of the objectives that affect project performance for example Nyakundi (2015) examined the Influence of project Management Processes on Outcomes but he did not study project initiation on its own but rather as one of the

objectives. Hence this study aimed at bridging the existing gap by giving more insight to the influence of project initiation not as an objective but as the main topic in this study to understand the significant of project initiation practices on performance of projects.

Further, most studies reviewed focused on the effect of individual practices on performance without analyzing the moderating effect resource mobilization thereby creating a gap that this research intends to fulfil (Igwe & Ude, 2018). The introduction of a moderating variable produces a different dimension that was absent in all other studies. The moderating variable thus makes this research unique and distinct from all other studies done on project initiation practices specifically, the study aims at assessing whether resource mobilization has a positive or a negative effect on the adoption of the various project initiation practices and whether the moderation affects performance.

Nzioka (2017) studied the Role of Project Management initiation on Project Success in Kenya. The role of project management planning functions: Scope Planning, Cost Planning, Time Planning and Quality Planning on the success of Kenya Power Infrastructure Development Projects were deduced from the results of the study. Nzioka (2017) did not consider important initiation practices such as risk identification and project feasibility. Therefore, this study seeks to fill these gaps by examining the role of project initiation practices such as risk identification, scope definition, and project feasibility study and project team selection.

In a study based in Zambia, Mkuni, (2016) sought to examine the role of project initiation in the completion of road construction projects in the country. The study conceptualized the project initiation process as the process of defining project objectives, scope, intended purpose and expected deliverables. The study indicated that project initiation aspects that influenced project performance included stakeholders involved in project initiation aspects. The study was conducted in Zambia the current study will be done in Kenya. The study did not study the moderating role of resource mobilization on project performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outline the methodology that was utilised in assessing the relationship between project initiation practices and performance of construction projects in Kenya. It explained the research design as well the philosophy underlying the research study. The chapter further explores on the target population, sample frame, sample size, data collection and procedures, pilot study, data analysis as well as data presentation.

3.2. Research Design

Research design refers to the strategy chosen to integrate the different components of the study in a coherent and logical way. It involves the blueprint for the collection, measurement and analysis of data (Creswell & Creswell, 2017). The study adopted a combination of descriptive research design and a cross sectional survey design to justify the relationship between the independent and dependent variables using both qualitative and quantitative techniques. A descriptive design involved describing the present status of the phenomenon, determining the nature of the prevailing conditions and seeking accurate descriptions (Pandey & Pandey, 2021). This design was appropriate for this study because the study aimed at presenting the findings of the study by observing and describing the behavior of the subjects without influencing them in any way (Kothari & Garg, 2019)

According to Orodho (2011) a cross- sectional survey design is a systematic research method for collecting data from a representative sample of individuals using instruments composed of closed-ended and/or open-ended questions, observations, and interviews. This design is used to gather data on more than one case at a single point in time in order to collect a body of quantitative data in connection to variables. The study picked data for projects and sought to investigate the concept trends and status of project performance at a particular period (2017-2021). These designs were successfully used in similar studies by [Kirimi and Njeru (2018), Muma, Nzulwa and

Ombui (2018), Muchelule, Iravo, Noor and Odhiambo (2018), Hassan, Gathenya and Iravo (2018)].

3.2.1 Research Philosophy

Research philosophy deals with the source, nature and development of knowledge. A research philosophy is belief about the ways in which data about a phenomenon should be collected, analysed and used. Each stage of the research process is based on assumptions about the sources and the nature of knowledge (Qutoshi, 2018). Research philosophies can be positivism, interpretivist, realism or pragmatism.

Interpretivists contend that only through the subjective interpretation of and philosophy in reality can that reality be fully understood. The study of phenomena in their natural environment is key to the Interpretivists philosophy, together with the acknowledgement that scientists cannot avoid affecting those phenomena under study. They admit that there may be many interpretations of reality, but maintain that these interpretations are in themselves part of the scientific knowledge they are Pursuing. Interpretivist has a tradition that is no less glorious than that of positivism, nor is it shorter (Carlson, 2014).

Realism philosophy believe that a world exists outside the influence of the researcher (the world is there to be discovered), while relativists believe that the world depends on how the individual views and experiences it (the world is different to different people). Historical realism is the belief that reality is shaped over time by values, for example social, political, cultural or gender (Guba and Lincoln 2011).

This study adopted positivism research philosophy. Positivism research philosophy reflects the belief that realism is stable. Positivist belief that hypothesis developed from existing theories can be tested by measuring observable social realities, thus positivism is derived from natural sciences. If a research philosophy reflects the principles of positivism, then it tends to adopt the philosophical stance of the natural scientists (Halperin & Heath, 2020). The study adopted positivism research philosophy since it relied on non-manipulative methods. This ensured that there was a distance between

the subjective biases of the researcher and the objective reality of the study. It involved stating theory, hypothesis generation and testing (Thomas et al., 2022).

3.3 Target Population

Target population is the complete set of individuals, cases or objectives possessing some commonality in the aspects the researcher aims at generalizing the outcomes of their study (Kothari & Garg, 2019). According to Susukida, Crum, Stuart, Ebnesajjad and Mojtabai (2016), the target population should have some observable characteristics, from which the researcher intends to generalize the results of the study.

The target population was the construction projects that had been implemented by the key government agencies within the Ministry of Transport, Infrastructure, and Housing and Urban Development from 2017 to 2021. According to the progress report by the Ministry of Transport, Infrastructure, Housing and Urban Development in 2021 there were 320 construction projects that had be implemented by the key government agencies in the ministry from the year 2017 to 2021. The unit of analysis was the construction projects that had been completed by the key government agencies in the ministry of transport and Infrastructure, in the last five years. The unit of observation were the project managers, who were purposively selected as respondents since they represent the three key interests on a project namely; business interest, supplier interest and user interests (Axelos, 2017). Therefore, the unit of observation was 320 project managers.

Table 3.1: Target Population

Parastatals	Number of Construction projects
KRC	14
KPA	14
KFS	6
KAA	33
KENHA	82
KURA	67
KRRA	74
NHC	30
Total	320

Source: Ministry of Transport, Infrastructure, Housing and Urban Development progress report, 2021

44

3.4. Sampling Frame

Sampling frame is defined as the list of the items or people forming a population from which a sample is taken (Berndt, 2020). In this paper, the sampling frame consisted of 320 construction projects undertaken by the key government agencies in the Ministry of transport and infrastructure for the last five years (Ministry of transport and infrastructure, 2021).

3.5. Sample Size and Sampling Techniques

Sampling techniques is the process of selecting a subset of individuals from within a statistical population to estimate character tics of a whole population (Brase & Brase, 2016). In this study probability sampling was used it can be either simple random. Sampling, stratified sampling or cluster sampling. The sampling technique for this study was stratified sampling since the sample used reflects accurately the population based on the criterion used. In this technique the characteristics which a researcher wishes to use are equally or proportionately distributed amongst the sample (Mukoka et al., 2020). Three criteria were used to determine the appropriate sample size the level of precision, the level of confidence or risk and degree of variability in the attribute being measured (Miaoulis & Michenera, 1976 in Israel, 2013). To compute the sample size the study adopted Yamane formula (1967). In this formula, sample size can be calculated at 3%, 5%, 7% and 10% precision (e) levels. Confidence level that will be used will be 95% with degree of variability (p) equivalent to 50% (0.5). n = sample size N= target population (320) e = margin error of 5%

$$n= \frac{N}{1+ Ne^2}$$

N= Target population (320)

E= margin error of 5%

In the proposed study, the sample size was calculated at precision level of 5% (e =0.05)

Sample size in this study was;

N= <u>320</u>   = 178

     1+ (320 x 0.05*2)

Therefore, the sample size was 178 construction projects

The study divided the population into 8 strata based on the key government agencies in the ministry of transport, infrastructure, housing and urban development. To identify the sample size for each stratum the research adopted the following formulae as used Velychko (2015).

$n_{i=kN_i}$ hence k= n/N= 178/320 = 0.55625 (56%)

Table 3.2: Sample Size

Parastatals	No of Construction Projects	Sample size (56%)
KRC	14	8
KPA	14	8
KFS	6	3
KAA	33	18
KENHA	82	46
KURA	67	37
KRRA	74	41
NHC	30	17
Total	**320**	**178**

3.6. Data Collection Instruments

Data collection is the means by which information is obtained from the selected subjects of an investigation (Creswell & Creswell, 2017). The study relied on both primary and secondary data. Primary data was collected using semi- structured questionnaires. Questionnaire were used since according to Bell et al. (2022) they are

effective data collection instruments that allow respondents to give much of their opinions regarding the research problem. A questionnaire is a data instrument that gathers data over a large sample and its objective is to translate the research objectives into specific questions, and answers for each question provide the data for hypothesis testing (Kwena, ,2020). Questionnaires are used when respondents can be reached and are willing to cooperate. Information can also be collected from a large sample that is able to write independently and hence it can be free from the interviewer bias (Cohen et al., 2014). Secondary data was collected through published scholarly articles, journals, books and other relevant literature.

3.7 Data Collection Procedure

Before actual data collection, the researcher was given an introduction letter from Jomo Kenyatta University of Agriculture and Technology. The researcher also obtained a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). A cover letter explaining the aim of the study was attached to the questionnaire prior to data collection. The data was collected using questionnaires which were self-administered to the respondents. The researcher recruited two research assistants to assist in the data collection exercise. The trained research assistants left the questionnaires with the respondents after explaining the confidentiality policy and collected them after two days. The respondents were free to contact the researcher via email or through the provided cell number within the two days majorly for clarification purposes.

3.8. Pilot Study

A pilot study is small scale preliminary study conducted in order to evaluate feasibility, time, cost, adverse events, and improve upon the study design prior to performance of a full-scale research project (Finlay-Jones et al., 2018)). A pilot study is important in spotting ambiguity, evaluating the type of answers given to determine whether they will help the researcher to achieve the laid down objectives (Lakens, 2022). According to Lakens (2022), a pilot sample should be between 1% and 10% depending on the sample size. The study carried out a pilot study of 17 government construction projects were not included in the final study results. The reason for carrying out a pilot study

was to ascertain the dependability and suitability of the data collection tool and study design in order to enhance validity and reliability of the data instrument (Kalatya & Moronge, 2017). A pilot test assists the researcher in determining if there are flaws, limitations or other weaknesses in the research instruments and or research design so as to allow revisions and or adjustments in good time prior to the conducting of the fieldwork.

3.8.1 Reliability of Data Collection Instruments

Reliability is the extent to which a research instruments yields finding that are consistent each time it is administered to the same subjects .It is influenced by the degree of error; as random error increases, reliability decreases (Lakens, 2022). In order to test the reliability of the data instruments, the study used the internal consistency measure known as Cronbach's Alpha. The Cronbach Alpha coefficient is denoted by 'r' which gives a range of 0-1. A Cronbach alpha of coefficient of 0.7 and above is commonly accepted rule of thumb that indicates acceptable reliability (Kothari & Garg, 2019).

3.8.2 Validity of the Data Collection Instruments

The validity of the research instruments is measure of how well a scientific test or piece of research measures what it sets out to, or how well it reflects the reality it claims to represent (Cohen et al., 2017). This study tested three types of validity; face, construct and content validity. Face validity tests whether the questions used in the questionnaire are aligned to the main theme of the study and that the respondents are most likely to understand them as intended by the researchers. Face validity was achieved whereby the experts in project management rated the questions in the questionnaire. Content validity was used to measure the extent the instruments provide adequate coverage of the topic under study. The content validity was achieved by subjecting the data collection instruments to an evaluation group who provided their comments and relevance of each item of the data instruments and the expert indicated whether the items were relevant or not.

Construct validity was assessed using Principal Component analysis. To assess whether the dataset was viable for the factor analysis, a Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity were carried out. The assumption of KMO test is that the coefficient should be positive and the higher the coefficient (closer to 1.0) the more the KMO test has been passed. On the other hand, the Bartlett's Test of Sphericity has the threshold of 0.05 such that the significance should be less than 0.05 for the test to have passed.

3.9. Data analysis and Presentation

Data analysis is the computation of certain measures along with searching for patterns of relationships that exist among data groups (Kothari & Garg, 2019). Data was analysed by using descriptive and inferential statistics. Descriptive statistics involved the use of measures of central tendency which included the mean, standard deviations, maximum and minimum values and variances. The purpose of descriptive statistics was to provide simple summaries about the measures in the study (Mertler et al., 2021). Inferential statistics included regression and correlation analysis

3.9.1 Diagnostic Tests

Diagnostic tests are meant to reduce the probability of Type I and Type II errors and improve accuracy of estimates (Harrell, 2017). Zimmermann, Pauly and Bathke (2019), indicated that in order to have a regression model and estimates that mean something we should be sure that the assumptions are reasonable and that the sample data appear to be sampled from a population that meets the assumption. The tests include factor analysis, linearity, normality tests, heteroscedasticity test and multicollinearity. The data collected was checked for violation of assumptions of linearity, normality, multicollinearity and autocorrelation.

Linearity Test

Linearity test is used to determine if there is a significant relationship between the dependent and each of the independent variables and whether the relationship is linear or not (Mertler et al., 2021).The study adopted a significant deviation of greater than 0.05 to imply that the relationship between the independent variable is linearly dependent,

while a deviation of less than 0.05 imply that the relationship between the independent variable is no linearly dependent (Brook & Arnold, 2018).

Normality

Normality test is used to determine whether sample data has been drawn from a normally distributed population (within some tolerance) and that the data set is well-modelled by a normal distribution. It is also important as it enables a researcher to compute the likelihood of a random variable underlying the data set to be normally distributed (Cooper & Schindler, 2011). The probability-probability plots (P-P plots) were used for visual test of normality of data, while Kolmogorov-Smirnov (K-S) test and Shapiro-Wilk test, which compares the scores in the sample to a normally distributed set of scores was carried out (Field, 2009).

Multicollinearity

Multicollinearity occurs when independent variables in a multiple regression model are correlated. A statistical assumption test is done to determine if the independent variables are highly correlated (Senaviratna & Cooray, 2019). Multicollinearity in the study was determined by using the variance inflation factors (VIF) and tolerance values. The VIF identifies the correlation between independent variables and the strength of the correlation. The parameters of VIF value of between 1 and 10, usually shows that there are no multicollinearity issues in the data while VIF value of greater than 10 or less than 1, indicate presence of multicollinearity issues.

3.9.2 Correlation Analysis

Correlation's analysis was done to determine the degree of the relationship between the independent variable and dependent variable using the Pearson Product-Moment Correlation and ranking will be done to determine which independent variable has a strong influence on performance of housing. The correlation coefficient ranges from -1.0 to +1.0 and the closer the coefficient is to +1 or -1, the more closely the two variables are related (Singh, 2016).

3.9.3 Regression Analysis

Regression analysis was used to determine the strength of the relationship between the dependent variable (usually denoted by Y) and the independent variables (denoted as X). The strength and reliability of the regression model was determined by using the coefficient of determination (R^2) and F-test. The R^2 value of 0% indicates that the model explains none of the variability of the response data around its mean. 100% indicates that the model explains all the variability of the response data around its mean (Kalnins, 2022). The study used ANOVA to determine whether the regression model is reliable or not. The study compared the F-value with the overall significance level to determine if the hypotheses are significant or not.

According to Kalnins (2022) a regression model helps one understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables are held fixed. The model in the study defined a relationship of variables in form of a mathematical equation. This was developed from the conceptual framework and from the theories relating to the performance of construction projects.

Bivariate Regression

Bivariate regression models will be fitted to determine the relationship between each independent variable and performance of construction projects. Bivariate models consider the relationship between two variables at a time without considering the combined joint relationships (Zhao et al., 2020). The study used the following models to determine the influences of each independent variable on performance of construction projects.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

$$Y = \beta_0 + \beta_2 X_2 + \varepsilon$$

$$Y = \beta_0 + \beta_3 X_3 + \varepsilon$$

$$Y = \beta_0 + \beta_4 X_4 + \varepsilon$$

Where;

Y = performance of construction projects

β_0 –   The intercept of the equation (Constant term)

X_1 –   Risk Identification

X_2 –   Scope Definition

X_3 –   Project Feasibility

X_4 –   Project Team Selection

ε –   The Error term

Multivariate Model

To test the combined effect of project initiation practices (risk identification, scope definition, project feasibility, project team selection) on the dependent variable, multiple regression models was fitted. The model aimed at estimating the joint influence of the independent variables on performance of construction projects. The multiple regression model was given by the equation below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \ \ldots\ldots\ldots\ldots\ldots \qquad \text{Equation 3.1}$$

Where: $\beta_1, \beta_2, \beta_3,$ and β_4 are the regression coefficients of the predictors in the model?

Y –   Performance of construction projects

β_0 –   The intercept of the equation (Constant term)

X_1 –   Risk Identification

X_2 –   Scope Definition

X_3 –   Project Feasibility

X_4 –   Project Team Selection

ε –   The Error terms

Moderated Multiple Regression (MMR)

To test whether resource mobilization moderates the relationship between project initiation practices and Performance of housing projects, Moderated Multiple Regression (MMR) statistical tool was used (Frazier, 2004). Moderated Multiple Regression (MMR) enabled the slope of one or more of the independent variables to vary across values of the moderator variable, thereby facilitating the investigation of an extensive range of relationships and function forms (Brook & Arnold, 2018). Kalnins (2022) posit that estimating interaction effects using moderated multiple regression usually consists of creating an Ordinary Least Squares (OLS) model and a Moderated Multiple Regression (MMR) model equation involving scores for a continuous predictor variable Y, scores for a predictor variable X, and scores for a second predictor variable Z hypothesized to be a moderator. To determine the presence of moderating effect, the OLS model was used then compared with the MMR model. Kihoro et al., (2017) used Moderated Multiple Regression in their study to test the moderating effects of resource mobilization on the relationship between project initiation practices and performance of construction projects. The second equation shows the Ordinary Least Squares (OLS) regression equation model predicting Y scores from the first-order effects of X and Z observed scores.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + Z + \varepsilon \ldots \text{Equation 3. 2}$$

Where: $\beta_1, \beta_2, \beta_3,$ and β_4 are the regression coefficients of the predictors in the model

Y –   Performance of construction projects

β_0 –   The intercept of the equation (Constant term)

X_1 –   Risk identification

X_2 –   Scope definition

X_3 –   Project feasibility

X_4 –   Project team selection

Z –   Resource mobilization

ε –   The Error terms

The third equation, the Moderated Multiple Regression (MMR) model is formed by creating a new set of scores for the two predictors (i.e. X, Z), and including it as a third term in the equation, which yields the following model:

$$Y = \beta_0 + \beta_1 X_1 * Z + \beta_2 X_2 * Z + \beta_3 X_3 * Z + \beta_4 X_4 * Z + \varepsilon$$
…………………………………………………………………. Equation 3.3

Where: β_1 to β_4 are the regression coefficients of the predictors in the model

Y –   Performance of construction projects

β_0 –   The intercept of the equation (Constant term)

X_1 –   Risk identification

X_2 –   Scope definition

X_3 –   Project feasibility

X_4 –   Project team selection

Z –   Resource mobilization

ε –   The Error terms

$X_i * Z$ Are the interaction terms between the independent variables and the moderator $(for\ i = 1\ to\ 4)\varepsilon$ – The error term

3.9.4. Hypotheses Testing

The research hypotheses were tested using the p value approach at 95% interval level based on linear regression analysis output produced by SPSS. This imply that the significance value will be set at 0.05. If the calculated P- value is less than the significant level (0.05) the null hypothesis will be rejected but if the calculated P- value is greater than the significance level (0.05) then we fail to reject the null hypothesis (Kennedy, 2019). The significance of the independent variables will be tested using F test and p value approaches. The decision rules will be to reject the null hypotheses and conclude that the effect of independent variable(s) is insignificant if the computed F value exceeds the critical F value or if the P value is less critical value of 0.05.

3.9.5. Data Presentation

The data was presented using tables, bar graphs, and pie charts. Frequency distribution tables were used to summarize categorical or numerical data. According to Pallant (2020) a frequency table is a table showing how often each value of the variable occurs in a data set. Frequencies and percentages will also be used to present the data. Frequency distribution tables are the devices that are used to present the data in a simple form. The tables were numbered and titles given.

3.9.7. Qualitative Analysis

Qualitative content analysis is defined as research method for the objective interpretation of content of text data through the systematic classification process of coding and identifying themes or patterns (Kuckartz, 2019). Content analysis has also been defined as an approach of empirical, methodological controlled analysis of texts within the context of communication by following content analysis rules and step by step models, without rash quantification and any qualitative data reduction and sense-making effort that makes a volume of qualitative material and attempts to identify core consistencies and meanings (Schreier et al., 2020). All these definitions agree that content analysis emphasizes an integrative view of speech /text and their specific contexts.

It goes beyond just counting words or extracting objective content from text to examine meanings, themes, and patterns that may be manifest in a particular text (Kuckartz, 2019).It allows the researcher to understand social reality in a subjective but scientific manner. Since there are some open-ended questions in the questionnaires, the researcher used content analysis approach of data analysis. Content analysis was used in the current study since it allows the researcher to understand social reality in a subjective but scientific manner as it addressed some of the weaknesses of the quantitative analysis which may be unable to unearth the feelings, emotions and the subjective responses evidenced in social studies (Schreier et al., 2020).

3.10 Operationalization of Study Variables

In social science research, operationalization refers to the development of concrete methodologies for measuring variables (Babbie, 1989). This process is concerned with defining variables in such a way that they can represent concepts (Senese, 1997). Researchers impose their opinions on how constructs should be measured in a study by operationalizing variables (Senese, 1997). The variables in this study were operationalized and quantified using customized scales based on standardized measures that have previously been used in research. Likert scale items were used to assess the four independent variables. Likert scale items were also used to measure the dependent variable. The likert scale was ranked as follows: 1 denotes strong disagreement; 2 denotes disagreement; 3 denotes neutrality; 4 denotes agreement; 5 denotes strong agreement. These scales were chosen because they had previously been used to operationalize the study variables in recognized research projects. The operationalization of variables is shown in Table 3.3.

Table 3.3: Summary of Operationalization of Variables

Variable Set	Variable	Indicator	Measurement
Independent	risk identification	• Risk reporting • Risk mitigation • Risk allocation •	Ordinal scale: Questionnaire was used based on five point likert scale
	Scope Definition	• Project objectives • Scope creep mitigation • Project deliverables •	Ordinal scale: Questionnaire was used based on five point likert scale
	Feasibility study	• Technical • Economic • Legal •	Ordinal scale: Questionnaire was used based on five point likert scale
	Project Team selection	• Timely identification • Roles and responsibilities • Experience •	Ordinal scale: Questionnaire was used based on five point likert scale
Moderating	Resource mobilization	• Financial • Time • Technology	Ordinal scale: Questionnaire was used based on five point likert scale
Dependent	Performance of construction projects	• Completion rate • Conformance to budget • Adherence to the quality standards	Ordinal scale: Questionnaire was used based on five point likert scale

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents information on the analysis of the data using descriptive and inferential statistics. It captured the response rate of the study, followed by the results from the pilot study and the demographic results. Factor analysis, the diagnostic tests and the correlation analysis are also captured in the study. The chapter covered the hypothesis testing through the regression model.

4.2 Response Rate

The questionnaires were administered to all the respondents as in the selected sample of 178   where 157 respondents returned back the fully filled questionnaires. This represented a response rate of 88.2%. According to Saunders (2019), a response rate of between 50% and 70% is adequate for the study with over a third (30%) of the population as the sample size. In this study, the sample size (178) was over 55% of the targeted population (320). This implies that a response rate of 89.2% was appropriate to represent the population of the study. Table 4.1 shows the response rate of the study.

Table 4.1: Response Rate of the Study

Sample Size		Response Rate		Non-Response	
Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
178	100%	157	88.2%	21	11.8%

4.3 Pilot Study Results

A pilot study is important in spotting ambiguity, evaluating the type of answers given to determine whether they will help the researcher to achieve the laid down objectives (Lakens, 2022). According to Lakens (2022), a pilot sample should be between 1% and 10% depending on the sample size. The study carried out a pilot study of 17 construction projects which were not included in the final study results. Therefore 17

questionnaires were piloted by issuing them to respondents who were not included in the final study sample.

4.3.1 Reliability Results

In order to test the reliability of the data instruments, the study used the internal consistency measure known as Cronbach's Alpha. The Cronbach Alpha coefficient is denoted by 'r' which gives a range of 0-1. A Cronbach alpha of coefficient of 0.7 and above is commonly accepted rule of thumb that indicates acceptable reliability (Kothari & Garg, 2019). All the variables were reliable since their Cronbach alpha was above 0.7 which was in agreement with (Kothari & Garg, 2019) who indicated that coefficient of 0.7 is commonly accepted rule of thumb that indicates acceptable reliability and 0.8 or higher indicate good reliability. The table 4.2 presents the reliability results.

Table 4.2: Reliability of Research Instruments

Variable	Cronbach's Alpha	N of Items
Risk Identification	0.827	11
Project Scope definition	0.809	11
Project Feasibility Study	0.881	12
Project Team Selection	0.902	13
Resource Mobilization	0.875	11
Project Performance	0.779	17
Overall	0.8455	

4.3.2 Validity of Results

The validity of the research instruments is a measure of how well a scientific test or piece of research measures what it sets out to, or how well it reflects the reality it claims to represent (Cohen et al., 2017). This study tested three types of validity; face,

construct and content validity. Face validity tests whether the questions used in the questionnaire are aligned to the main theme of the study and that the respondents are most likely to understand them as intended by the researchers. Face validity was achieved whereby the experts in project management rated the questions in the questionnaire. Content validity was used to measure the extent the instruments provide adequate coverage of the topic under study. The content validity was achieved by subjecting the data collection instruments to an evaluation group who provided their comments and relevance of each item of the data instruments and the expert indicated whether the items were relevant or not. Construct validity was assessed using Principal Component analysis.

4.3.3 Validity Results for Risk Identification

The validity results on the risk identification revealed that face validity was achieved whereby the experts in project management rated the questions under risk identification to be highly addressing the risk reporting, risk mitigation and risk allocation aspects. On the other hand, the content validity on risk identification was achieved where the respondents explained to have understood the questions based on the aspects of risk identification. The experts also indicated that the statements were aligned with the underlying issues in risk identification, which is the essence of content validity. Construct validity on the aspects of risk identification on the questionnaire was assessed using Principal Component analysis.

Factor analysis was carried out on the aspects of risk identification. As the findings in Table 4.3 reveal, out of the 11 aspects on risk identification, they all met the 0.40 threshold where the highest "The risk factors in our project are shared among the respective stakeholders" had a factor loading of 0.919 while the least "Extent do you think risk identification has influenced the performance of construction projects" had a factor loading of 0.431. This implied that the aspects under risk identification met the construct validity. This was in agreement with Bowman and Goodboy, (2020) sets a 0.40 threshold whereby if a factor does not add up to 0.40 factor loading, they ought to be excluded from the research instrument.

Table 4.3: Factor Loadings on Risk Identification

Aspects	Loadings
Different risks are identified prior to commencement of a project	.759
The risks identified are communicated to all the project stakeholders.	.761
Increase in project risk reporting influence project performance	.593
There are measures taken to mitigate risks immediately they occur	.722
Analysis of different mitigation measures is done before choosing the appropriate one	.822
Most of the identified risks in our project have been timely mitigated	.863
The risk factors in our project are shared among the respective stakeholders	.919
There is a set framework for sharing costs/responsibilities arising from identified risks in the project	.871
There is a risk register to keep track of any risk occurrence and respective costs	.844
Through risk identification the progress of the project has been more effective.	.860
Extent do you think risk identification has influenced the performance of construction projects	.431
Overall	.768

Extraction Method: Principal Component Analysis

4.3.4 Validity Results for Project Scope Definition

The validity results on the project scope definition revealed that face validity was achieved whereby the experts in project management rated the questions under project scope definition to be highly addressing the project objectives, scope creep mitigation and project deliverables. On the other hand, the content validity on project scope definition was achieved where the respondents explained to have understood the questions based on the aspects of project scope definition. The experts also indicated that the statements were aligned with the underlying issues in project scope definition, which is the essence of content validity. Construct validity on the aspects of project scope definition on the questionnaire was assessed using Principal Component analysis. Factor analysis was carried out on the aspects of project scope definition. A threshold of 0.40 was set. As the findings in Table 4.4 reveal, out of the 11 aspects on project scope definition, they all met the 0.40 threshold where the highest "All stakeholders are involved if any of the objective is to be re-defined" had a factor loading of 0.858 while the least "Through a well-defined scope the project saves on costs" had a factor loading of 0.632. This implied that the aspects under scope definition met the construct validity.

Table 4.4: Factor Loading On Scope Definition

Aspects	Factor Loadings
The project has clearly defined objectives to the understanding of the project team	.753
The objectives of our project are adequate as per the general scope of the project	.727
All stakeholders are involved if any of the objective is to be re-defined	.858
There are instances that creep has occurred in our project's scope	.763
The project management upholds continuous communication with key project stakeholders to reduce occurrence of scope creep	.843
There is always a back-up plan to ensure the project continues smoothly even when a growth in the scope occurs.	.651
The project has clearly defined deliverables right before it commences	.749
The set deliverables are communicated to every member of the project team	.670
The deliverables of the project are aligned with the project objectives	.820
Through a well-defined scope the project saves on costs	.632
extent do you think the project performance could be attributed to the scope definition	.815
Overall	0.753

Extraction Method: Principal Component Analysis

4.3.5 Validity Results for Project Feasibility Study

The validity results on the project feasibility study revealed that face validity was achieved whereby the experts in project management rated the questions under project feasibility study to be highly addressing the technical feasibility, economic feasibility and legal feasibility aspects. On the other hand, the content validity on project feasibility study was achieved where the respondents explained to have understood the questions based on the aspects of project feasibility study. The experts also indicated that the statements were aligned with the underlying issues in project feasibility study, which is the essence of content validity. Construct validity on the aspects of project feasibility study on the questionnaire was assessed using Principal Component analysis.

The factor analysis results on project feasibility study are as shown in Table 4.5. Factor analysis gives factor loadings which range from 0 to 1. A threshold of 0.40 was adopted. As the results reveal, out of the 12 aspects on project feasibility study, they all met the 0.40 threshold where the highest "Feasibility studies carried out in our project captures all the technical prospects required to successfully complete the project" had a factor loading of 0.879 while the least "An assessment is done to ensure

that the projects are capable of generating the expected economic benefits" had a factor loading of 0.647. This is an indication that project feasibility study through technical feasibility, economic feasibility and legal feasibility obtained the construct validity.

Table 4.5: Factor Loadings on Project Feasibility Study

Aspects	Loadings
An analysis of the project is done to ensure the project will meet the technical requirements before commencing	.856
There is a clear assessment of the availability of technical expertise before the project commences	.839
Feasibility studies carried out in our project captures all the technical prospects required to successfully complete the project	.879
An assessment of the economic viability of the project is done before the project commences	.687
The feasibility studies in our projects focuses on the expected economic cost of the project	.669
An assessment is done to ensure that the projects are capable of generating the expected economic benefits	.647
An analysis is done to ensure the project meets the legal requirements before the project commences	.692
Any changes in regulations and policies with regard to the projects are documented during the feasibility studies	.871
Through the feasibility studies the project has been able to meet any legal requirements	.778
The project management has a set rationale for an effective feasibility study before every project commences	.821
The magnitude of the feasibility studies has played a role in the success of the projects	.787
extent do you think the feasibility study could have contributed to the project performance	.725
Overall	.771

Extraction Method: Principal Component Analysis.

4.3.6 Validity Results on Project Team Selection

The validity results on the project team selection revealed that face validity was achieved whereby the experts in project management rated the questions under project team selection to be highly addressing the timely identification, roles and responsibilities and experience aspects. On the other hand, the content validity on project team selection was achieved where the respondents explained to have understood the questions based on the aspects of project team selection. The experts also indicated that the statements were aligned with the underlying issues in project team selection, which is the essence of content validity. Construct validity on the aspects of project team selection on the questionnaire was assessed using Principal Component analysis.

The factor loadings for the questions under project team selection are as shown in Table 4.6. As the results portray, the factor "The project potential team members are informed of their individual roles before they join the team" had the lowest factor loading of 0.568 while the factor "There is a systematic process for selecting the project team members" had the highest factor loading of 0.894. This is an indication that all the factor loadings for the questions under the variable met the 0.40 threshold hence the questions were ruled to be valid.

Table 4.6: Factor Loadings on Project Team Selection

Aspects	Loadings
There is a systematic process for selecting the project team members	.894
A clear selection criteria is shared to the qualifying individuals in good time	.748
The project team members are timely identified before the project commences	.831
There are clearly set roles for every project team member	.605
The project potential team members are informed of their individual roles before they join the team	.568
The roles and responsibilities of the project team are aligned to the specific objective of the project	.802
Team members are allocated clear roles and responsibilities	.770
The level of expertise required in given aspects of the project is communicated to all potential project team members	.881
Skills requirement is considered important in selection of team members	.845
Team members are required to possess specialized qualifications	.764
The selection process of the project team is open and fair	.736
The accuracy level of the project team selection has been a determinant on the success of the project	.788
extent do you think the project team selection process has influenced the performance of the project?	.588
	.755
Overall	

 Extraction Method: Principal Component Analysis

4.3.7 Validity Results on Resource Mobilization

The validity results on the resource mobilization revealed that face validity was achieved whereby the experts in project management rated the questions under resource mobilization to be highly addressing the financial resource, time resource and technology resource aspects. On the other hand, the content validity on resource mobilization was achieved where the respondents explained to have understood the

questions based on the aspects of resource mobilization. The experts also indicated that the statements were aligned with the underlying issues in resource mobilization, which is the essence of content validity. Construct validity on the aspects of resource mobilization on the questionnaire was assessed using Principal Component analysis.

The factor loadings for the resource mobilization are as shown in the Table 4.7. The findings indicate that the factor loadings for the questions under the variable met the 0.40 threshold with the lowest factor "Timelines for the project are set right during the initiation stage of the project" have a factor loading of 0.593 while the highest factor "The financial resources availed are adequate for financing the operations of the projects to completion" having a factor loading of 0.880. This implies that the factor loadings under the variable met the threshold hence construct validity was achieved.

Table 4.7: Factor Loadings on Resource Mobilization

Aspects	Loadings
The financial resources availed are adequate for financing the operations of the projects to completion	.880
There is a budget drawn for the project's financial needs before the project commences	.844
A plan for meeting the financial obligations for the project has been put across	.862
In case the finances available are not adequate for the project outsourcing for more finances is done	.771
Timelines for the project are set right during the initiation stage of the project	.593
The daily working hours for the project team are adequate for carrying the project into success	.629
In cases of uncertainties the project timelines could be adjusted to a most appropriate deadline	.709
Technology has been embraced as one of inputs for the project	.692
There are modern communication technologies to enhance information sharing in the project	.776
The project management has been committed to integrate the right technology in the project operations	.794
The mobilization of the resources has been a determinant of the effectiveness of project initiation process	.728
	.753
Overall	

Extraction Method: Principal Component Analysis

4.3.8 Validity Results for Project Performance

The validity results on the project performance revealed that face validity was achieved whereby the experts in project management rated the questions under project performance to be highly addressing the timely completion, adherence to budget and quality of project aspects. On the other hand, the content validity on project performance was achieved where the respondents explained to have understood the

questions based on the aspects of project performance. The experts also indicated that the statements were aligned with the underlying issues in construction projects performance, which is the essence of content validity. Construct validity on the aspects of project performance on the questionnaire was assessed using Principal Component analysis

Factor analysis was carried out on the aspects of project performance. A 0.40 threshold was set whereby factors not adding up to 0.40 factor loading would be excluded. As the findings in Table 4.8 reveal, out of the 17 aspects on project performance, they all met the 0.40 threshold where the highest "Completion within the set budget" had a factor loading of 0.948 while the least "The work done in the project is significant to the timelines used" had a factor loading of 0.640. This implied that the aspects under project performance met the construct validity.

Table 4.8: Factor Loadings on Project Performance

Aspects	Loadings
Estimated project completion time	.921
Actual project completion time	.874
Estimated project budget	.857
Actual project budget	.802
Total variation orders	.861
Cost of defects after handing over the project to the beneficiaries	.897
Cost of defects after defect correction	.928
The project phases have been completed within the planned timeframes	.898
The work done in the project is significant to the timelines used	.640
The percentage of the already done work of the project have used an equivalent percentage of budget	.911
The remaining funds in the budget are adequate to run the remain part of the project into success	.907
The stakeholders have shown their satisfaction with the progress of the project	.802
The completed phase of the project is aligned to the intended quality standards	.876
Completion within the set Timelines	.889
Completion within the set budget	.943
Quality of the project	.825
	.885
Satisfaction of the project target users	
	.865
Overall	

Extraction Method: Principal Component Analysis

66

4.4 Background Information

This section analyses the background information ranging from state agencies, type of project, and number of personnel and length of period the project has been ongoing. The background information was sought in order to assist the researcher in determining whether the respondents of the study were a representative sample of the target population for generalization purposes.

4.4.1 State Agencies

The study sought to establish the specific state agencies in which the surveyed projects belonged to. As the findings on Figure 4.1 reveal, 22.9% of the projects were under the National Housing Corporation, 17.2% of the projects were under the Kenya Urban Roads Authority (KURA), 12.7% of the projects were under Kenya National Highways Authority (KeNHA) similar to those under the Kenya Rural Roads Authority (KERRA). Kenya Railway Corporation, Kenya Ports Authority and Kenya Ferry Services had the least number of projects with 7.6%, 8.3% and 8.9% respectively. The findings imply that just as the government has been focused on enhancing the housing through the Big-4 agenda, and promoting road connectivity across the country, and so is the concentration of the projects in the state agencies under such dockets.
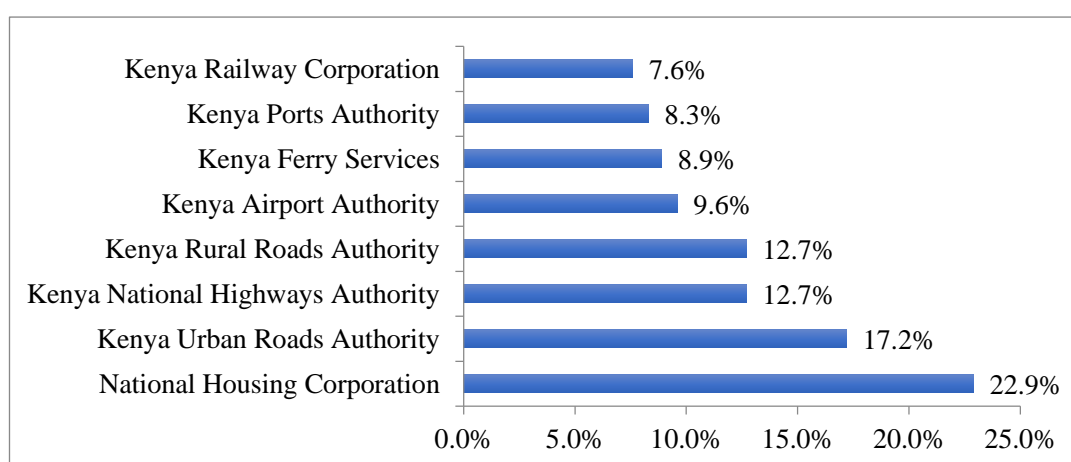
Figure 4.1: State Agencies Under which the Projects are Attached

4.4.2 Type of Project

The study sought to establish the type of the projects based on their classification. The broad classification of construction projects comprises of mega projects, major projects and the mini projects. Mega projects are large-scale, complex ventures that typically cost more than 1 billion, take many years to build, involve multiple public and private stakeholders, are transformational, and impact millions of people (Flyvbjerg, 2014). Major projects are capital improvement projects who's authorized funding or estimated cost is greater than five hundred million or projects approaching 500 million with a high level of interest by the public. Mini projects are minimal projects costing less than KSH, 100million. As the results on Figure 4.2 reveal, most of the projects (64.3%) were major projects, 22.3% were mini projects while mega projects were only 13.4% of the surveyed projects. This implies that the government has been mainly focusing on major projects, which a times cost less but with huge benefits to the economy at large (WB, 2019).
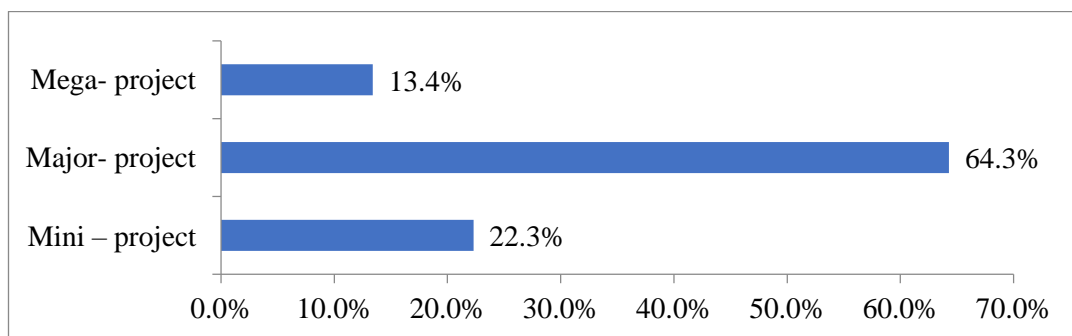
Figure 4.2: Category of the Projects

4.4.3 Number of Personnel

The study sought to establish the number of personnel in the surveyed projects. According to Kiengers (2019), the number of personnel in a project determines the effectiveness of the project and the connection between the size of the project team and success of the project. As the results in Figure 4.3 reveal, most of the projects (36.9%) had between 41 and 60 personnel, 33.1% of the projects had between 61 and 80 personnel, 21% of the projects had below 40 personnel with 10.2% having less than 20 employees. Only 4.5% of the projects had more than 100 projects. While the size

68

of the workforce in a project could be determined by the size of the project, the set timelines and available resources could also influence the number of personnel in a given project (Mwenja, 2019). However, the size of the workforce in a project has a direct connection with the completion and effectiveness of the project.
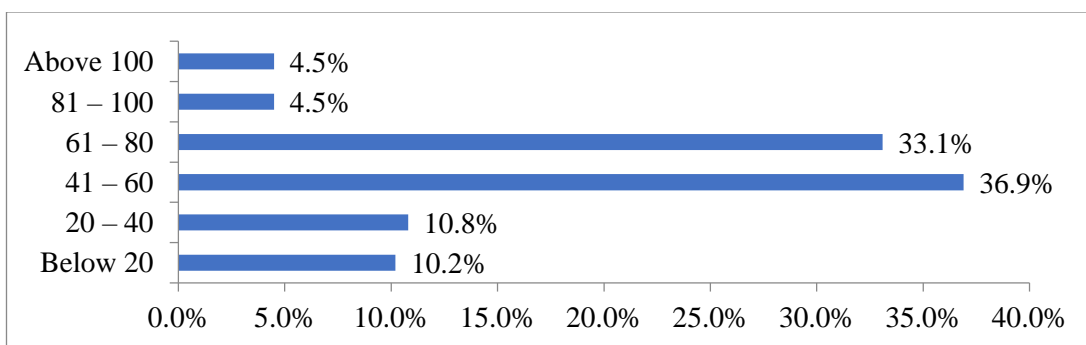
Figure 4.3: Number of Personnel in the Projects

4.4.4 Length of Period the Project has been On-going

The study sought to establish the period that the projects had been running. As the findings on Figure 4.4 portray, 45.2% of the projects had been running for a period of between 4 and 6 years, 27.4% were running for over 6 years, 18.5% of the projects had been ongoing for a period of between 1 and 3 years while 8.9% of the projects had been in progress for less than a year. The findings imply that the completion rate of the public construction projects is still low, with most of the projects going for more than five years, despite the fact that most of the government projects take between 1 and 2 financial years.
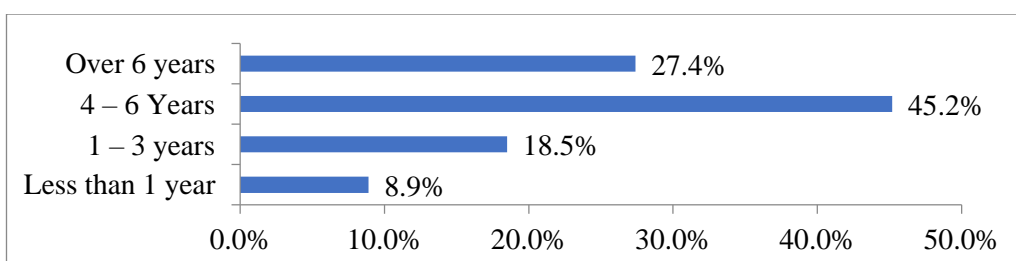
Figure 4.4: Period of Project Progress

4.5 Descriptive Analysis of the Study Findings

Descriptive statistics involved the use of measures of central tendency which included the mean, standard deviations, maximum and minimum values and variances. The purpose of descriptive statistics was to provide simple summaries about the measures in the study (Mertler et al., 2021) The main statistics captured are mean, percentages and standard deviation. The findings are presented systematically as per the study variables. The study adopted the Scale of the Mean: Below 2.9 = Disagree; 3.0 – 3.1 = Neutral; 3.1 and above = agree to draw the conclusions on descriptive statistics (Saunders, 2019).

4.5.1 Descriptive Results on Risk Identification

The first objective of the study was to assess the influence of risk identification on the performance of construction projects in Kenya. The study sought to assess the influence of risk reporting, risk mitigation and risk allocation on project performance. The respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from these key aspects of project risk identification. A 5-points Likert's scale was used where 1 was strongly disagree, 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree. Table 4.9 shows the findings. As the findings portray, the respondents agreed that different risks were identified prior to commencement of projects in their respective projects (Mean= 3.22; standard deviation= 1.41) and that the risks identified were communicated to all the project stakeholders (Mean= 3.54; standard deviation= 1.14). The findings concurred with those of Renault et al. (2020) who stated that the best way of initiating a project and ensuring that the project runs to success is by identifying risks that may arise in the project before a project commence. This was also in agreement with Alderton, 2014 who stated that the project manager must communicate with stakeholders early and as often as necessary and explain the nature of the risks.

It was further established that most of the respondents agreed that through an increase in project risk reporting, project performance was enhanced in their respective projects (Mean = 3.36; standard deviation= 1.25). According to Urbański et al. (2019), reporting risks is an essential risk identification aspect that ensures the risks are

properly noted on time, and a record kept for making effective decisions on how to address and mitigate the risks. The respondents further agreed that there were measures taken to mitigate risks immediately they occur in their respective projects as shown by a mean of 3.24 and a standard deviation of 1.40. They further agreed that the analysis of different mitigation measures was done before choosing the appropriate one to adopt (Mean = 3.56; standard deviation= 1.31). The respondents also noted that most of the identified risks in their respective projects were timely mitigated (Mean = 3.64; standard deviation = 1.15) and that the risk factors in the projects were shared among the respective stakeholders (Mean = 3.67; standard deviation= 1.03). This was in agreement with Cui et al. (2020) who established that identification of risks is the only way through which risks can be mitigated hence ensuring delivery of quality projects at a cheaper costs and within the set timelines.

The findings imply that the risks responsibilities are shared among the stakeholders, which is an essential approach of ensuring that the burden of mitigating risks do not go to one stakeholder. This as noted by Alderton (2014), plays a significant role in promoting the effectiveness and success of the projects even in the midst of risks and uncertainties. The findings further revealed that there was a set framework for sharing costs/responsibilities arising from identified risks in the respective projects (Mean = 3.82; standard deviation = 1.11) and that there was a risk register to keep track of any risk occurrence and respective costs (Mean = 3.45; standard deviation = 1.12). The respondents agreed that as a result of risk identification in their respective projects, the progress of the project had been more effective. This compares with the findings by Lagat and Tenai (2017) who established that risk identification is a crucial step in managing projects especially during the project initiation phases since it forms the bases for risk management process for the entire project. Further, Sun, Cui, and Liu (2017) contemplate that the identification of risks is the only way through which the risks can be mitigated, thus ensuring delivery of quality projects at a cheaper cost and within the set timelines. The study further sought to establish the extent to which risk identification was attributed to project performance. The respondents were asked to indicate their opinion on the extent to which the success of their respective projects was as a result of risk identification. As the findings on Figure 4.5 reveal, 54.7% of the respondents indicated that risk identification had a high extent on the performance

71

of the construction projects while 19.7% of the respondents indicated that that risk identification influenced project performance to a low extent. This was with agreement with Kinyua et al. (2015) who established that risk identification and project performance had a positive correlation since risk identification enables organizations to establish appropriate mitigation measures. Further Ndambiri and Kimutai (2018) contemplate that project risk identification strongly and positively influences project performance explained by budget, scope, schedule customer metrics and learning and growth measures.

Table 4.9: Descriptive Statistics on Risk Identification

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
Different risks are identified prior to commencement of a project	17.2%	17.8%	11.5%	32.5%	21.0%	3.22	1.41
The risks identified are communicated to all the project stakeholders.	7.0%	10.2%	26.1%	35.7%	21.0%	3.54	1.14
Increase in project risk reporting influence project performance	10.2%	15.9%	20.4%	34.4%	19.1%	3.36	1.25
There are measures taken to mitigate risks immediately they occur	14.6%	21.7%	12.1%	28.7%	22.9%	3.24	1.40
Analysis of different mitigation measures is done before choosing the appropriate one	8.3%	16.6%	17.2%	26.8%	31.2%	3.56	1.31
Most of the identified risks in our project have been timely mitigated	5.7%	12.1%	19.1%	38.2%	24.8%	3.64	1.15
The risk factors in our project are shared among the respective stakeholders	3.8%	12.1%	15.3%	51.0%	17.8%	3.67	1. 03
There is a set framework for sharing costs/responsibilities arising from identified risks in the project	5.1%	10.2%	10.8%	45.2%	28.7%	3.82	1.11
There is a risk register to keep track of any risk occurrence and respective costs	7.6%	10.8%	27.4%	37.6%	16.6%	3.45	1.12
Through risk identification the progress of the project has been more effective.	7.6%	13.4%	27.4%	31.2%	19.7%	3.44	1.19
Overall mean						3.49	

Key: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree
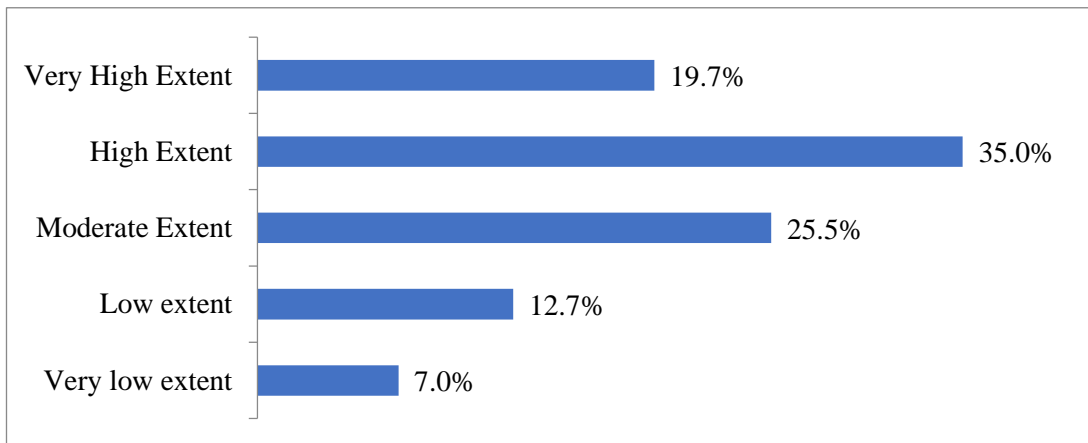
Figure 4.5: Extent to which Risk Identification Influence Project Performance

4.5.2 Project Scope Definition

The second objective of the study was to assess the influence of project scope definition on the performance of construction projects in Kenya. The study sought to assess the influence of project objectives, scope creep mitigation and project deliverables on project performance. The respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from these key aspects of project scope definition. A 5-points Likert's scale was used where 1 was strongly disagree, 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree. Table 4.10 shows the findings.

As the findings portray, it was revealed that the respondents agreed that their respective projects had clearly defined objectives to the understanding of the project team (Mean = 3.75; standard deviation = 1.04) and that the objectives of their respective projects were adequate as per the general scope of the projects (Mean = 3.27; standard deviation = 1.31). The respondents further agreed that all the stakeholders were involved if any of the objectives in their respective projects was to be re-defined as shown by a mean of 3.58 and a standard deviation 1.10. The findings compare with those by Fageha and Aibinu (2017) who established that the objectives of the projects as defined during the projects scope definition stage are crucial in determining the success of the projects by providing a framework on the implementation of the project.

The findings further revealed that majority of the respondents disagreed that there were instances that creep had occurred in their respective projects' scope (Mean = 2.55; standard deviation = 1.27) and that the project management in their respective projects upheld continuous communication with key project stakeholders to reduce occurrence of scope creep (Mean = 2.82; standard deviation = 1.30). The respondents further disagreed that there were always back-up plans to ensure their respective projects continue smoothly even when a growth in the scope occurs and that the projects had clearly defined deliverables right before they commenced as shown by a mean of 2.99 and 2.73 respectively. According to Ogunberu et al. (2018), setting deliverables for any project show the commitment by the project management to have the projects implemented effectively. However, where deliverables are not set, the project team might not have the pathway towards achieving the results intended (Dicks et al., 2017).

The findings further revealed that the set deliverables were communicated to every member of the project team (Mean = 3.75; standard deviation = 1.23) and that the deliverables of the projects were aligned with the project objectives (Mean = 3.89; standard deviation = 1.09). The respondents agreed that as a result of a well-defined scope, their respective projects were more effective by saving on operational costs. The findings compare with those by Lukhele et al., (2021) who established that the definition of a project scope is instrumental in enhancing the success of the project, but this is possible when the project teams were involved in the definition process including deriving the objectives and deliverables. According to Akhwaba (2020), project scope definition is more of drawing a pathway and a plan on how the project will be implemented and what needs to be achieved at the end of the project.

The study further sought to establish the extent to which project performance could be attributed to the scope definition of the project. The respondents indicated their opinions and as the findings on Figure 4.6 show, 56.7% of the respondents indicated that project scope definition influenced project performance to a high extent, while 29.3% indicated that project performance was influenced by project scope definition to a low extent. This was noted by Verzuh (2015) who found that a major contribution to unsuccessful projects is the lack of understanding or defining project and product scope at the start of the project. This was also in alignment with Mirza et al., (2013)

who stated that a properly defined and managed scope leads to delivering a quality product, in agreed cost and within specified schedules to the stake-holders.

Table 4.10: Descriptive Statistics on Project Scope Definition

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
The project has clearly defined objectives to the understanding of the project team	4.5%	8.3%	17.8%	47.1%	22.3%	3.75	1.04
The objectives of our project are adequate as per the general scope of the project	12.7%	15.9%	24.2%	25.5%	21.7%	3.27	1.31
All stakeholders are involved if any of the objective is to be re-defined	6.4%	10.8%	19.1%	45.9%	17.8%	3.58	1.10
There are instances that creep has occurred in our project's scope	26.1%	29.9%	12.1%	26.8%	5.1%	2.55	1.27
The project management upholds continuous communication with key project stakeholders to reduce occurrence of scope creep	19.1%	28.7%	11.5%	32.5%	8.3%	2.82	1.30
There is always a back-up plan to ensure the project continues smoothly even when a growth in the scope occurs.	18.5%	18.5%	15.3%	40.8%	7.0%	2.99	1.27
The project has clearly defined deliverables right before it commences	25.5%	17.8%	19.1%	33.8%	3.8%	2.73	1.27
The set deliverables are communicated to every member of the project team	9.6%	7.6%	11.5%	41.4%	29.9%	3.75	1.23
The deliverables of the project are aligned with the project objectives	7.0%	5.1%	7.6%	52.9%	27.4%	3.89	1.09
Through a well-defined scope the project saves on costs	10.2%	15.3%	9.6%	49.7%	15.3%	3.45	1.22
Overall mean						3.28	

Key: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree
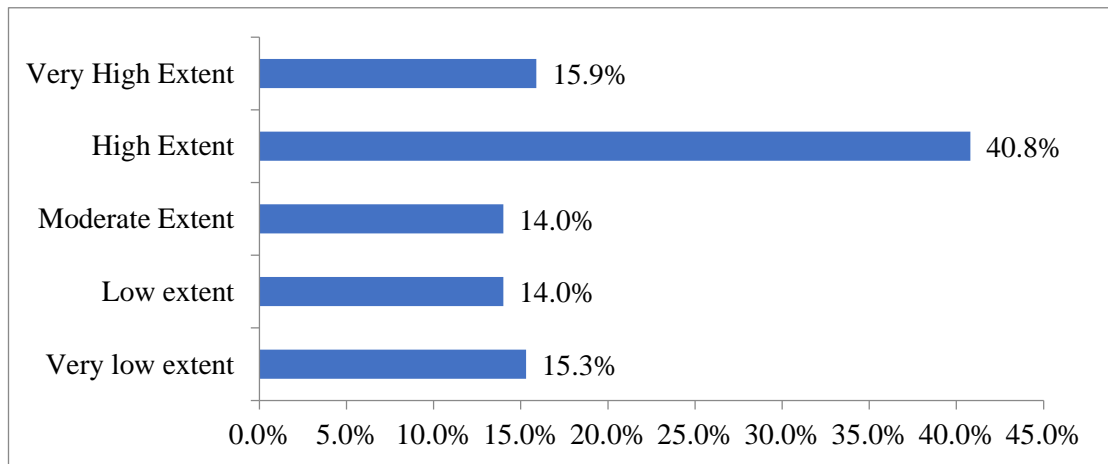
Figure 4.6: Extent to which Project Performance is Influenced by Scope Definition

4.5.3 Project Feasibility Study

The third objective of the study was to assess the influence of project feasibility study on the performance of construction projects in Kenya. The study sought to assess the influence of technical feasibility, economic feasibility and legal feasibility on project performance. The respondents were asked to indicate their level of agreement or disagreement with specific statements drawn from these key aspects of project feasibility study. A 5-points Likert's scale was used where 1 was strongly disagree, 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree. Table 4.11 shows the findings. As the results portray, the respondents disagreed that there was analysis of the projects done to ensure the projects would meet the technical requirements before commencing as shown by a mean of 2.82 and a standard deviation of 1.30. The respondents further disagreed that there were clear assessments of the availability of technical expertise before their respective projects commenced and that the feasibility studies carried out in their respective projects captured all the technical prospects required to successfully complete the projects as shown by mean of 3.03 and 2.62 respectively. Lack of effective project feasibility studies affects the ability of the projects to meet the expected goals since the pathways towards implementation of the projects is not identified as early (Halimi et al., 2018). According to Martig *et al.* (2016), assessing the feasibility of the project ensures that the project is in line with the legal and other technical requirements before it commences, thus making the

implementation of the project smooth and effective. The findings further portrayed those assessments of the economic viability of the projects was done before the projects commenced (Mean = 3.31; standard deviation = 1.20). It was however established that the feasibility studies in most of the projects did not focus on the expected economic cost of the projects and that the assessment was not effectively done to ensure that the projects were capable of generating the expected economic benefits (mean = 2.62; 3.00). As noted by Krieger, Martig, Van Den, brink and Berger, 2016 economic feasibility study should be done to ensure that projects whose expected economic benefits exceed resources should be selected this will ensure only economic viable projects are undertaken. The respondents however agreed that analysis was done to ensure their respective projects met the legal requirements before they commenced and that any changes in regulations and policies with regard to the projects were documented during the feasibility studies as shown by mean of 3.41 and 3.26 respectively. This was in alignment with Momin and Sahadev (2017), who stated that having feasibility studies to assess any changes in policy framework and ensuring that this sit properly documented plays a critical role in enhancing the project success. The findings further revealed that most of the respondents were of the opinion that there were no effective feasibility studies to ensure that the projects conformed to the legal requirements (Mean = 2.62; standard deviation = 1.11) This was in agreement with Nadwa, (2015) who stated that most construction projects are started by political elite hence no time is taken to analyze the project nor do a feasibility study. The projects management team in the projects had set rationale for an effective feasibility study before every project commenced (Mean = 3.43; standard deviation = 1.09). The respondents also agreed that the magnitude of the feasibility studies in their respective projects had played a role in the success of the projects. This concurred with the findings of (Goel et al., 2020) that feasibility studies are essential in determining the legal, technical and economic benefits of the project, thus ensuring the projects are implemented with the provided premises based on economy, technicality and legal framework. (Saad Al-Sumaiti et al., 2020) on the other hand contends that the feasibility studies in any project are meant to ensure that the project does not face implementation challenges in the middle of the implementation, since this should derail of completely affect the continuity of the project. The respondents were further

asked to indicate the extent to which in their opinion, project feasibility study contributed to the performance of construction projects. The study findings as shown in Figure 4.7 revealed that majority of the respondents (64.6%) were of the opinion that project feasibility study influenced project performance to a high extent, while 22.3% considered project feasibility study to influence project performance to a low extent. This was in agreement with Munns, and Bjeirmi, (2017), who found that project feasibility studies had a positive relationship with project success.

Table 4.11: Descriptive Statistics on Project Feasibility Study

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
An analysis of the project is done to ensure the project will meet the technical requirements before commencing	19.1%	28.7%	12.7%	30.6%	8.9%	2.82	1.30
There is a clear assessment of the availability of technical expertise before the project commences	14.6%	16.6%	24.2%	40.1%	4.5%	3.03	1.16
Feasibility studies carried out in our project captures all the technical prospects required to successfully complete the project	24.2%	25.5%	17.2%	30.6%	2.5%	2.62	1.22
An assessment of the economic viability of the project is done before the project commences	14.0%	8.3%	21.7%	45.2%	10.8%	3.31	1.20
The feasibility studies in our projects focuses on the expected economic cost of the project	26.1%	23.6%	17.8%	26.8%	5.7%	2.62	1.28
An assessment is done to ensure that the projects are capable of generating the expected economic benefits	15.3%	22.3%	17.8%	36.3%	8.3%	3.00	1.24
An analysis is done to ensure the project meets the legal requirements before the project commences	10.2%	13.4%	16.6%	45.2%	14.6%	3.41	1.19
Any changes in regulations and policies with regard to the projects are documented during the feasibility studies	11.5%	18.5%	12.1%	48.4%	9.6%	3.26	1.20
Through the feasibility studies the project has been able to meet any legal requirements	17.2%	33.1%	21.7%	26.1%	1.9%	2.62	1.11
The project management has a set rationale for an effective feasibility study before every project commences	6.4%	15.9%	17.8%	48.4%	11.5%	3.43	1.09
The magnitude of the feasibility studies has played a role in the success of the projects	17.8%	8.9%	1.3%	42.0%	29.9%	3.57	1.45
Overall mean						3.06	

Key: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree
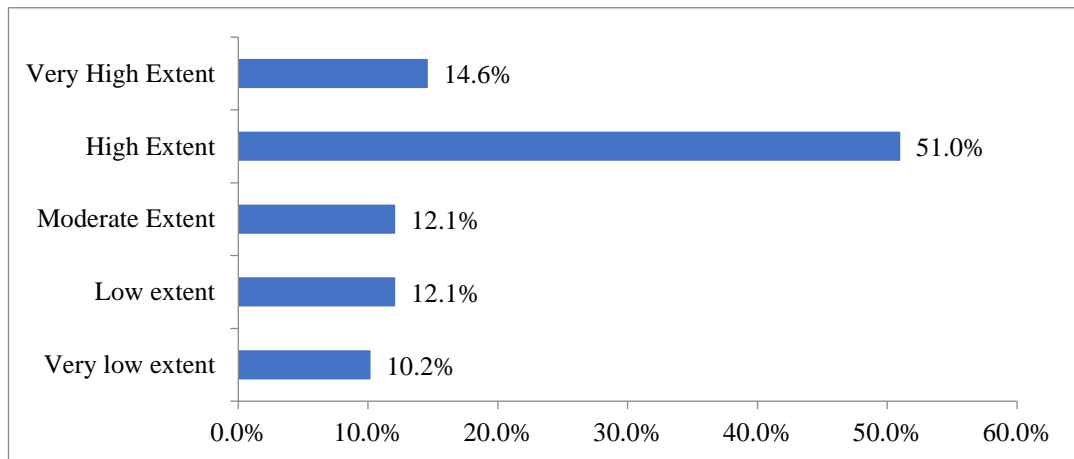
Figure 4.7: Extent to which Project Feasibility Study Influence Project Performance

4.5.4 Project Team Selection

The fourth objective of the study was to establish the influence of project team selection on the performance of construction projects in Kenya. The main aspects of project team selection focused on in the study included the timely identification, roles and responsibilities and the level of experience. The respondents were asked to indicate their level of agreement or disagreement with specific statement drawn from these aspects of project team selection. The findings are as shown in Table 4.12.

As the findings portray, majority of the respondents disagreed that there were systematic processes in their respective projects for selecting the project team members (Mean = 2.83; standard deviation = 1.23). They however felt that there lacked clear selection criteria which is shared to the qualifying individuals in good time (Mean = 3.11; standard deviation = 1.16). The respondents agreed that the team members in their respective projects were timely identified before the projects commenced and that there were clearly set roles for every project team member as shown by mean of 3.39 and 3.13 respectively. The findings concur with those by Wu et al., (2019) who established that the identification of the appropriate employees and skills to be used in a project is essential in ensuring that the project is implemented as per the plan and that the skills and competencies available match the specifications of the project.

The findings further revealed that most of the respondents agreed that their respective projects' potential team members were informed of their individual roles before they joined the team (Mean = 3.36; standard deviation = 1.07) and that the roles and responsibilities of the project team were aligned to the specific objective of the projects (Mean = 3.26; standard deviation = 1.21). The respondents also agreed that the team members in their respective projects were allocated clear roles and responsibilities. This as indicated by Shastri et al., (2021) ensures that there are no conflicts of duties and responsibilities and that all the project stakeholders and team members effectively play their role without interference.

It was further established that the level of expertise required in given aspects of the projects was communicated to all potential project team members (Mean = 4.08; standard deviation = 0.66) and that the skills requirement was considered important in selection of team members in the surveyed projects (Mean = 4.18; standard deviation = 0.60). The respondents further agreed that the team members in their respective projects were required to possess specialized qualifications and that the selection process of the project team was open and fair (Mean= 4.09; 3.29). The respondents further agreed that the accuracy level of the project team selection had been instrumental in the success of the projects. The findings concur with those by Collins and James (2018) who established that the selection of the project team is essential in determining the extent to which the project meets its mandate. According to Mbiru et al., (2021), the skills and competences possessed by the workers in a given project are the core drivers of the project success. As indicated by Sankaran, et al., (2020), it remains integral to analyzing the major inputs ion terms of skills and competencies that the projects will require thus selecting a team for the project based on the identified needs.

The study further sought to establish the extent to which the adoption of project team selection influenced the performance of the construction projects. The findings as shown in Figure 4.8 revealed that 57.4% of the respondents were of the opinion that project team selection influenced project performance to a high extent while 16.2% of the respondents indicated that project team selection influenced project performance to a low extent. This was in agreement with Assaf, Hassanain and Mughal (2014)

findings who found that there is a positive and high correlation between project team selection and project performance.

Table 4.12: Descriptive Statistics on Project Team Selection

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
There is a systematic process for selecting the project team members	17.2%	27.4%	17.2%	31.8%	6.4%	2.83	1.23
A clear selection criterion is shared to the qualifying individuals in good time	10.2%	25.5%	14.0%	43.9%	6.4%	3.11	1.16
The project team members are timely identified before the project commences	8.3%	14.6%	15.3%	52.9%	8.9%	3.39	1.10
There are clearly set roles for every project team member	14.6%	13.4%	21.0%	46.5%	4.5%	3.13	1.16
The project potential team members are informed of their individual roles before they join the team	7.6%	13.4%	22.9%	47.1%	8.9%	3.36	1.07
The roles and responsibilities of the project team are aligned to the specific objective of the project	14.0%	10.8%	20.4%	44.6%	10.2%	3.26	1.21
Team members are allocated clear roles and responsibilities	1.9%	10.8%	4.5%	66.9%	15.9%	3.84	0.89
The level of expertise required in given aspects of the project is communicated to all potential project team members	0.0%	4.5%	4.5%	69.4%	21.7%	4.08	0.66
Skills requirement is considered important in selection of team members	0.0%	2.5%	2.5%	68.8%	26.1%	4.18	0.60
Team members are required to possess specialized qualifications	1.3%	3.8%	3.2%	68.2%	23.6%	4.09	0.73
The selection process of the project team is open and fair	6.4%	22.3%	29.3%	20.4%	21.7%	3.29	1.21
The accuracy level of the project team selection has been a determinant on the success of the project	7.0%	19.1%	24.2%	23.6%	26.1%	3.43	1.26
Overall mean						3.50	

Key: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree
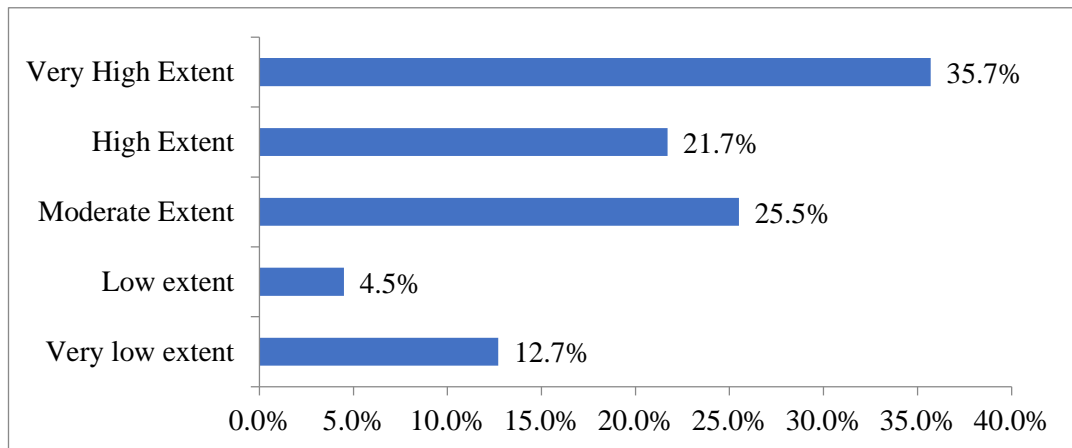
Figure 4.8: Extent to which Project Team Selection Influence Project Performance

4.5.5 Resource Mobilization

The fifth objective of the study was to assess the moderating effect of resource mobilization on the relationship between project initiation practices and performance of construction projects in Kenya. The study assessed resource mobilization through financial resources, time resources and technology resources. These are the core resources that ought to be mobilized in a project to enhance the role played by key project processes such as project initiation towards the project performance. A Likert's scale was used where 1 was strongly disagree, 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree. Table 4.13 shows the findings.

As the findings portray, the respondents agreed that the financial resources availed were adequate for financing the operations of the projects to completion (Mean = 3.38; standard deviation = 1.03) and that there were budgets drawn for the project's financial needs before the project commences (Mean = 3.32; standard deviation = 1.18). The respondents however disagreed that they had plans for meeting the financial obligations for the projects (Mean = 2.90; standard deviation = 1.24). The respondents further disagreed that in case the finances available were not adequate for their respective projects outsourcing for more finances was done (Mean= 2.88). According to Odeyinka and Yusuf (2014), financial resources are essential in running a project to

success. Umulisa et al. (2017) contend that financing is essential for projects in that it's a crucial resource that defines the ability of the project to meet its objectives.

The findings further revealed that the timelines for the projects were not effectively set right during the initiation stage of the projects as shown by a mean of 2.97 and a standard deviation of 1.23. The respondents further disagreed that the daily working hours for their respective project's teams were adequate for carrying the projects into success as shown by a mean of 2.80 and a standard deviation of 1.25. It was also established that in cases of uncertainties, the projects' timelines were not effectively adjusted to a most appropriate deadline. According to Tsuma, Siringi, and Wambua (2020), time is a critical factor in projects that require to be effectively managed for better and successful completion of the projects. González-Cacheda and Outeda (2021) further stated that there is need for effective management of time as one of the resources and inputs for the project.

The findings further revealed that most of the projects had embraced technology as one of inputs for the projects (Mean = 3.13; standard deviation = 1.31). The respondents however disagreed that there were modern communication technologies embraced in their respective projects to enhance information sharing. The respondents however agreed that the management of their respective projects had been committed to integrate the right technology in the projects operations (Mean = 3.36; standard deviation = 1.18). The findings are in line with those by Pan and Zhang (2021) who found out that technology stands to be a critical aspect in the modern era that creates a more effective framework for project operations.

Table 4.13: Descriptive Statistics on Resource Mobilization

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
The financial resources availed are adequate for financing the operations of the projects to completion	7.6%	12.1%	21.7%	52.2%	6.4%	3.38	1.03
There is a budget drawn for the project's financial needs before the project commences	8.9%	17.8%	18.5%	41.4%	13.4%	3.32	1.18
A plan for meeting the financial obligations for the project has been put across	14.6%	30.6%	11.5%	36.3%	7.0%	2.90	1.24
In case the finances available are not adequate for the project outsourcing for more finances is done	15.9%	26.8%	15.3%	37.6%	4.5%	2.88	1.21
Timelines for the project are set right during the initiation stage of the project	15.3%	24.8%	14.0%	39.5%	6.4%	2.97	1.23
The daily working hours for the project team are adequate for carrying the project into success	18.5%	27.4%	15.9%	31.8%	6.4%	2.80	1.25
In cases of uncertainties the project timelines could be adjusted to a most appropriate deadline	13.4%	24.2%	17.2%	36.9%	8.3%	3.03	1.22
Technology has been embraced as one of inputs for the project	15.9%	20.4%	10.8%	40.8%	12.1%	3.13	1.31
There are modern communication technologies to enhance information sharing in the project	18.5%	28.0%	14.6%	31.8%	7.0%	2.81	1.26
The project management has been committed to integrate the right technology in the project operations	10.2%	14.6%	16.6%	46.5%	12.1%	3.36	1.18
The mobilization of the resources has been a determinant of the effectiveness of project initiation process	18.5%	28.0%	21.0%	26.1%	6.4%	2.74	1.22
Overall mean						3.0	

Key: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree

4.5.6 Performance of Construction Projects

The study sought to establish the opinions of the respondents on the performance of their respective projects. The respondents were asked to indicate their level of agreement on the performance of the construction projects based on a 5-points Likert's scale. The respondents disagreed that project phases in their respective projects had been completed within the planned timeframes (Mean = 2.18; standard deviation = 1.24) and that the work done in the project was significant to the timelines used (Mean

84

= 2.08). The study further established that majority of the respondents disagreed that the percentage of the already done work of the project have used an equivalent percentage of budget and that the remaining funds in the budget are adequate to run the remaining part of the project into success (Mean = 2.24; 2.39). It was also established that the stakeholders in most of the projects had not shown their satisfaction with the progress of the projects and that the completed phases of the projects were not aligned to the intended quality standards. As indicated by Gichamba & Kithinji, (2019) the performance of a project is considered good if the project is completed within the schedule, within the budget, achieves the set goals and ensures stakeholders satisfaction,

The respondents were further asked to rate specific aspects of project performance based on a scale of 1 to 5 with 1 as the lowest and 5 as the highest. As the findings on Table 4.15 portray, the completion of the projects within the set timelines was rated at very low by 49% of the respondents and low by 25.5% of the respondents. The completion of the projects within the set budget was rated at very low and low by 38.3% and 30% of the respondents respectively. The quality of the projects was rated low by 15.7% of the respondents while 44.5% of the respondents rated it very low. Further, 36.6% of the respondents felt that their respective projects met very low satisfaction of the stakeholders and other target users while 43.6% felt that the satisfaction was low

Table 4.14: Descriptive Statistics on Project Performance

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
The project phases have been completed within the planned timeframes	39.6%	36.4%	14.0%	6.9%	3.1%	2.18	1.24
The work done in the project is significant to the timelines used	43.8%	26.4%	8.9%	10.1%	7.8%	2.08	1.35
The percentage of the already done work of the project have used an equivalent percentage of budget	45.1%	29.6%	5.7%	5.2%	14.4%	2.24	1.42
The remaining funds in the budget are adequate to run the remain part of the project into success	29.9%	33.1%	19.1%	3.2%	14.6%	2.39	1.34
The stakeholders have shown their satisfaction with the progress of the project	27.4%	54.8%	2.5%	5.1%	10.2%	2.16	1.18
The completed phase of the project is aligned to the intended quality standards	38.9%	43.9%	10.8%	2.5%	3.8%	1.89	0.96
Overall mean						2.16	

Key: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree

Table 4.15: Rating the Aspects of Project Performance

Aspects	Very Low	Low	Neutral	High	Very High
Completion within the set Timelines	49.0%	25.5%	10.2%	3.8%	11.5%
Completion within the set budget	38.3%	30.0%	7.0%	12.7%	12.0%
Quality of the project	44.5%	15.7%	4.5%	19.7%	15.6%
Satisfaction of the project target users	36.6%	43.6%	1.7%	20.6%	7.6%

4.5.7 Secondary Data on Project Performance

Secondary data was obtained to establish the trend in performance of the construction projects for a period of 5 years (from 2017 to 2021). The study concentrated on completed projects for a period of 2017 to 2021. The main aspects sought were the estimated project completion time and the actual completion time, the estimated project budget and the actual project budget, the total variation of orders, the cost of defects after handing over the project and the cost of defects after the correction. The findings are as summarized figure 4.9, 4.10 and figure 4.11.

Budgeted and Actual Cost of the Projects

From the findings, it was established that the actual cost of the projects was high than the budgeted cost. This is an indication that most of the construction projects were not completed within the set budget, an indicator of poor performance of the projects. Poor cost management approaches have been blamed for poor project performance in the construction industry (Okereke et al. 2022). According to Muute and James (2019), most of the construction projects in Kenya tend to utilize more funds than it was budgeted for, and this is mainly orchestrated by the management processes put in the project implementation.
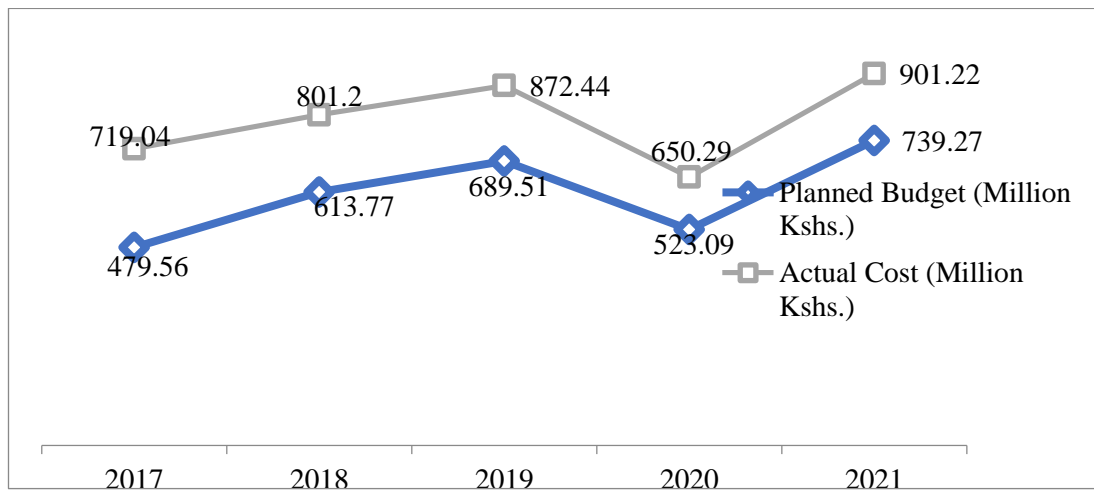
Figure 4.9: Budgeted and Actual Cost of the Projects

Budgeted and Actual Cost of the Defects

Defects in a project are flaws and deficiencies that occur during the implementation of the project. They are factored in during project costing and budgeting to ensure they do not affect the quality of the project. The findings as shown in the Figure below revealed that the actual cost of defects was higher than the budgeted cost, an indication that the projects were consuming more in terms of defects that it was actually expected. This is a major concern that affects most projects, to the point of deteriorating the quality of the project and its overall performance. The trend shows that the actual costs of defects are steadily increasing over the years, exceeding the budged amount by over Kshs. 60 million in 2021.

87

Values on chart:
73.165, 77.91, 89.67, 109.27, 123.412 (orange series)
38.413, 41.36, 58.44, 53.193, 55.201 (blue series)

Legend: Budgeted Cost of Defects (Kshs.,…)

X-axis: 2017, 2018, 2019, 2020, 2021
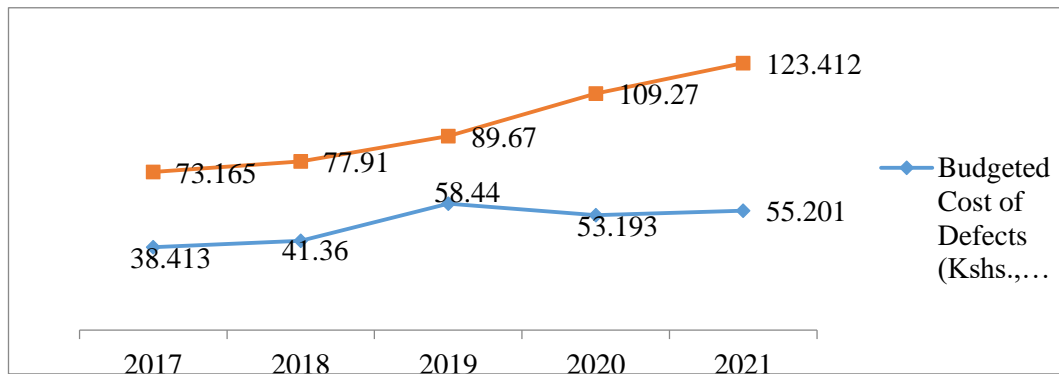
Figure 4.10: Budgeted and Actual Cost of the Defects

Project Completion Timelines

The study sought to establish the trend in the construction projects completion timelines. The results as shown in the Figure below revealed that the actual project completion timeline was higher than the planned timeline. This implies that most projects took longer time to be completed that they were actually planned for. This according to Kinyua and Werengo (2021) leads to increased cost of the project and the overall value of the project declines as it it takes more time to be completed. In year 2021 for instance, while on avaerage the construction projects were planned to be completed within 18.1 months, the actually took over 35 months, which is almost twice the timelined initially planned for. Schedule overruns and cost overruns in construction projects occur due to scope changes by stakeholders ,construction mistakes and defective work , lack of database in estimating activity duration and resources, incomplete design and ambiguous documents.
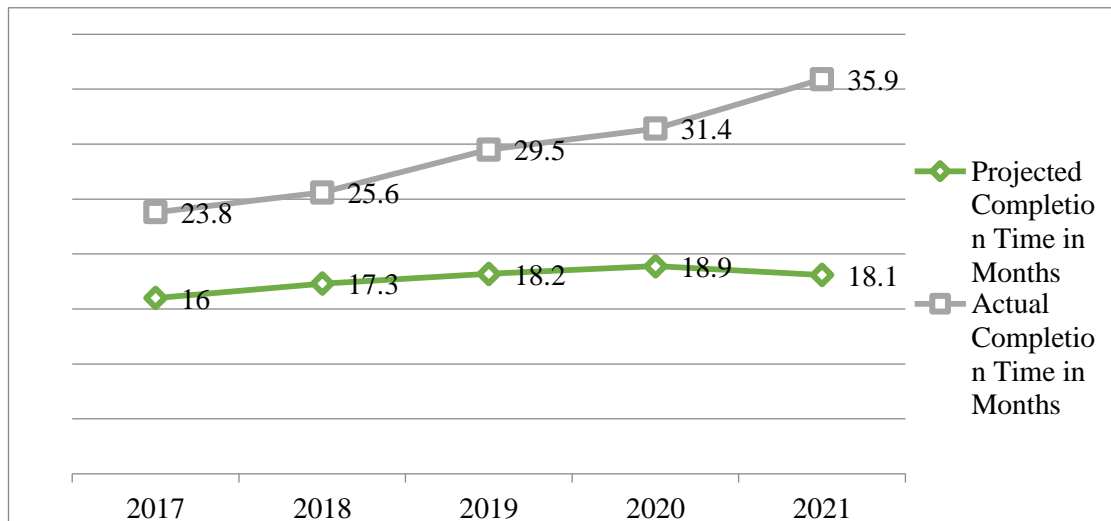
Figure 4.11: Project Completion Timelines

4.6 Qualitative Analysis

Qualitative content analysis is defined as research method for the objective interpretation of content of text data through the systematic classification process of coding and identifying themes or patterns (Kuckartz, 2019). Since there are some open-ended questions in the questionnaires, the researcher used content analysis approach of data analysis. Content analysis was used in the current study since it allows the researcher to understand social reality in a subjective but scientific manner as it addressed some of the weaknesses of the quantitative analysis which may be unable to unearth the feelings, emotions and the subjective responses evidenced in social studies (Schreier et al., 2020).

4.6.1 Qualitative Analysis on Risk Identification

The respondents were asked to expound on their views in regard to the role played by risk identification on the performance of their respective projects. The respondents commented that risk identification was essential for the projects in that it helped the project management to identify any risks that the project would face early enough for the appropriate mitigation measures to be taken. Majority of the respondents indicated that; *construction projects have a lot of risks. This is why every project including ours ought to be keen to identify any possible risks right from the initiation stage so as to*

come up with ways of mitigating the risks and early identification of risks is essential so that when the risks occur, they do not get us by surprise. The respondents further noted that reporting risks and having effective risk allocations were essential measures for ensuring that the projects were effectively implemented. The respondents noted that while identification of risks was essential in enhancing project success, at times their projects failed to identify the efficiently, where aspects such as allocation of risks through sharing of risks and losses among the stakeholders were not upheld.

4.6.2 Qualitative Analysis on Scope Definition

The study collected qualitative data through open-ended questions where the respondents were asked to give their opinions in regard to the project scope definition and its effect on the performance of the construction projects. Majority of the respondents commented that project scope definition was instrumental in enhancing the effective implementation of the projects. They indicated that through definition of project scope, the project team was able to grasp of the deliverables in terms of project objectives and come up with a defined way of implementing the project to meet the project plan. Majority of the respondents highlighted that; *as a project team, we are tasked with implementing the project just as it is in the plan. This is why we emphasize on having a proper project scope definition where the key pathway and inputs for the project to be implemented successfully are put across. If we have the project objectives, the mitigation of any creep and having clear project deliverables, we believe the projects would be performing better*. The respondents were of the opinion that, the project scope definition in their respective projects was not as appropriate, thus this would prevent them from achieving the expected project goals

4.6.3 Qualitative Analysis on Project Feasibility Study

The respondents were asked to give their opinions in regard to the role played by project feasibility study on the performance of construction projects. The respondents indicated that the feasibility study carried out at the project initiation stage was critical in enabling the project stakeholders understanding the viability of the project. They indicated that the success of projects is tied on the ability of the implementation process to be seamless such that the project meets all the laid put policies, and

technicalities. Majority of the respondents stated the following; *Projects have varied policies and other requirements that should be met before they are implemented. Being huge investments, no government or investor would afford to lose the investments, when it is discovered that the project might have failed to meet the set criteria and the project has already been initiated. This is where feasibility study is essential in a project. A successful project ought to start by having a clear feasibility study to establish the legal and economic issues that may arise and how to align the project with such requirements.*

The respondents further elaborated that the feasibility study in their respective projects was essential in showing the pathway for the project, and ensuring that the projects were implemented on the basis of what is legally, economically and technically viable. They indicated that the process of implementation of a project can be smooth only when adequate and effective feasibility study is carried out.

4.6.4 Qualitative Analysis on Project Team Selection

The qualitative data collected through the open-ended questions sought to establish the views of the respondents in regard to the effect of project team selection on the performance of construction projects. The findings revealed that most of the respondents perceived project team selection as an essential practice of project initiation that ensured the projects were well-staffed for effective implementation. The respondents indicated that the personnel in the projects were essential in the success of the projects, and this was determined by the effectiveness of the project team selection process. Majority of respondents noted the following: *Projects are implemented by the project team, which comprises of the key personnel in the project including the project management. Having a good project team that grasps what is required of the project is essential for the project to be implemented appropriately. Although at times we have challenges in identifying the appropriate team for the project, we strongly believe that the project team plays a significant role in the success of the project.* The respondents further indicated that their respective projects could have stalled or failed to be completed on time due to the gaps in the project team selection. The respondents felt that the project team selection process was not timely

and the roles and responsibilities were not clearly put across in some instances, and this could be the reason behind the underperformance of the projects.

4.6.5 Qualitative Analysis on Resource Mobilization

The study further sought to establish the opinions of the respondents in regard to the role played by resource mobilization in stirring the success of their respective projects. The respondents commented that the project resources were essential for the smooth running of the projects. Most of the respondents were of the opinion that the project mobilization skills by the project managers determined the ability of the project initiation process to contribute effectively to the project success. Majority of the respondents had written the following: *The project management is responsible for mobilizing the right resources for the projects, be it financial resources, technical inputs and other key inputs for the project. These resources are the ones that determine the success of the project. We therefore believe that if we have the right resources mobilized and availed timely and adequately, the project would perform better.*

The respondents further indicated that the financial resources were not adequate in some phases of the project, and this affected the effective implementation of the projects. They further said that through the mobilization of the resources, their respective projects were kept afloat and capable of financing their extensive processes, thus enabling the projects to be completed within time and as per the plan.

4.7 Diagnostic Tests

Diagnostic tests are meant to reduce the probability of Type I and Type II errors and improve accuracy of estimates (Harrell, 2017). This was done to establish whether the model used in the study would meet the assumptions using the adopted questionnaire in the main study. The main tests carried out included: linearity test, normality test, multicollinearity test and test for autocorrelation.

4.7.1 Normality Test

Normality test is used to determine whether sample data has been drawn from a normally distributed population (within some tolerance) and that the data set is well-modelled by a normal distribution. It is also important as it enables a researcher to compute the likelihood of a random variable underlying the data set to be normally distributed (Cooper & Schindler, 2011). The Q-Q plots were used for visual test of normality of data, while Kolmogorov-Smirnov (K-S) test and Shapiro-Wilk test, which compares the scores in the sample to a normally distributed set of scores were carried out (Field, 2009).

The Kolmogorov-Smirnov and Shapiro-Wilk test results are as shown. The significance levels for the variables should be above 0.05 to imply that the dataset is normally distributed. As the results portray, all variables had K-S and Shapiro-Wilk significance levels above 0.05. This is an indication that the data was normally distributed.

The normality test further carried out using the normality curve. A Q-Q plot was used for the test where it is assumed that a normal distributed data will take a zigzag shape and does not follow a defined flow or trend. For a normally distributed data, the plots do not fall in one straight line. The findings as shown in figure 4.12 revealed that the curves for each variable took a zig-zag shape and did not follow a defined trend. This implies that the visual normality was achieved.

Table 4.16: Tests of Normality

Variables	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Risk Identification	.174	157	.184	.877	157	.078
Project Scope Definition	.259	157	.104	.857	157	.084
Project Feasibility Study	.188	157	.114	.867	157	.090
Project Team Selection	.147	157	.200	.960	157	.624
Resource Mobilization	.126	157	.200	.961	157	.656
Performance of Construction Projects	.153	157	.200	.948	157	.429

a. Lilliefors Significance Correction
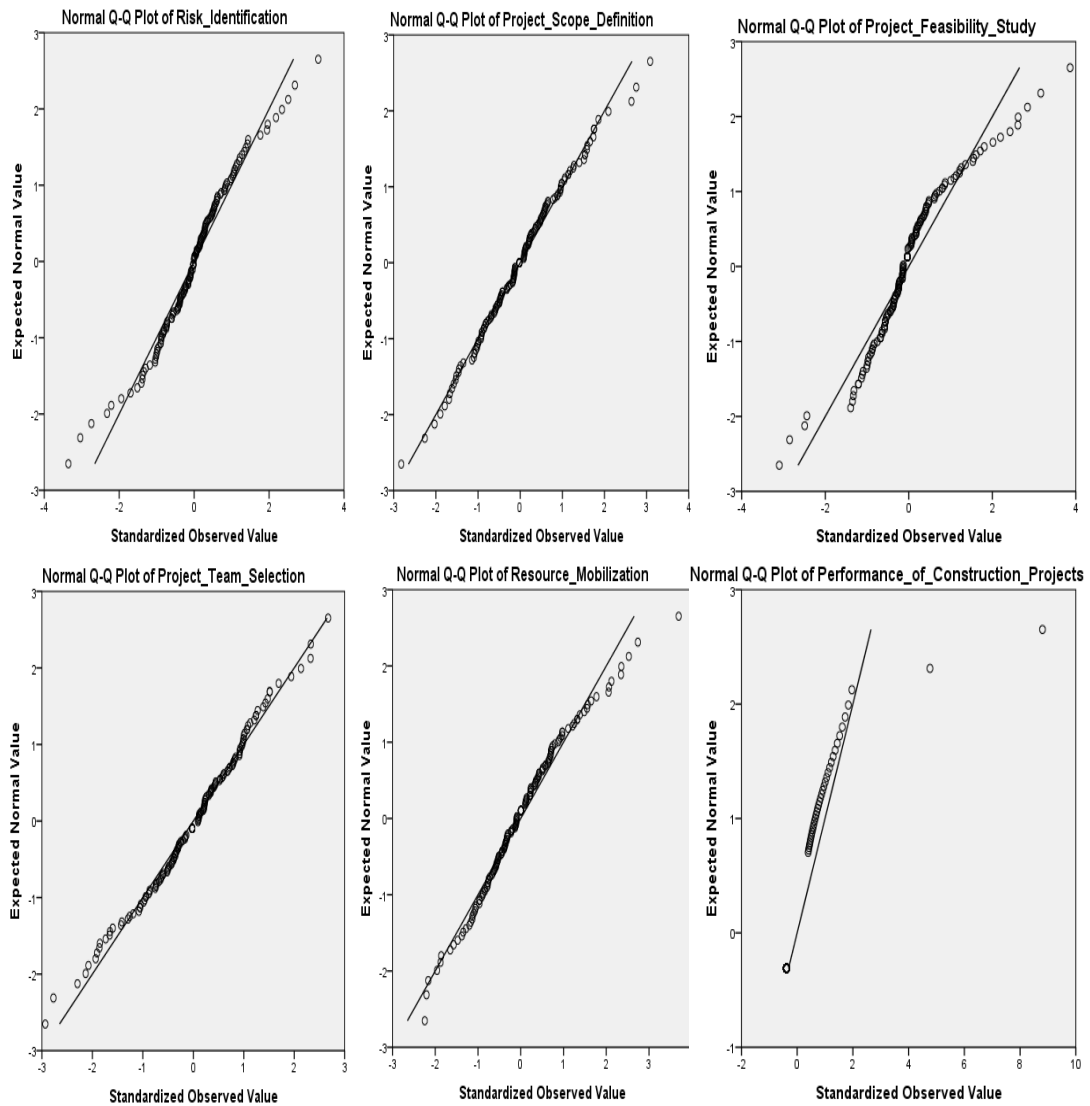
Figure 4.12: Q-Q Plots

4.7.2 Multicollinearity Test

Multicollinearity occurs when independent variables in a multiple regression model are correlated. A statistical assumption test is done to determine if the independent variables are highly correlated (Cohen et al., 2017). Multicollinearity in the study will be determined by using the variance inflation factors (VIF) and tolerance values. The VIF identifies the correlation between independent variables and the strength of the correlation. The parameters of VIF value of between 1 and 10, usually shows that there are no multicollinearity issues in the data while VIF value of greater than 10 or less than 1, indicate presence of multicollinearity issues (Mukherjeeet & Roy, 2017). As

94

the results show, the VIFs for all the variables without moderator and with moderator are in the 1 – 10 range an indication that there was no problem of multicollinearity among the predictor variables since the reported VIF and tolerance statistics were within the acceptable range for both models that is model before and after the inclusion of the moderator.

Table 4.17: Results of Multicollinearity

Model	Collinearity Statistics without moderator	
	Tolerance	**VIF**
(Constant)		
Risk Identification	.770	1.299
1 Project Scope Definition	.670	1.492
Project Feasibility Study	.805	1.242
Project Team Selection	.683	1.463
	Collinearity Statistics with moderator	
	Tolerance	**VIF**
Model		
(Constant)		
Risk Identification *Z	. 524	1.908
Project Scope Definition*Z	. .294	3.402
Project Feasibility Study*Z	.485	2.062
Project Team Selection*Z	. .324	3.085

4.7.3 Linearity Test

Linearity test is used to determine if there is a significant relationship between the dependent and each of the independent variables and whether the relationship is linear or not (Hahs-Vaughn, 2016). The study adopted a significant deviation of greater than 0.05 to imply that the relationship between the independent variables is linearly dependent, while a deviation of less than 0.05 imply that the relationship between the independent variable is no linearly dependent (Draper & Smith, 2014). The findings in table 4.18 indicated that there was a linear relationship between risk identification and project performance the P value for deviation from linearity was 0.052 which was greater than 0.05 Project scope definition had a significant deviation of 0.539 which was greater than 0.05 meaning there was a linear relationship between project scope definition and

project performance. There was a linear relationship between project feasibility study and project performance this was supported by a deviation from linearity of 0.101 which was greater than 0.05. Finally, there was a linear relationship between project team selection and project performance this was supported by a deviation from linearity of 0.534 which was greater than 0.05. Scatter plots were also used to test for linearity and visually show whether there was a linear or curvilinear relationship between two continuous variables. The findings were presented in figure 4.13, figure 4.14, figure 4.15, and figure 4.16 the plots showed a positive gradient, which implies that risk identification, project scope definition, project feasibility and project team selection significantly influenced the performance of the construction projects in Kenya.

Table 4.18: Linearity Test

			Sum of Squares	df	Mean Square	F	Sig.
Performance of_Construction_Projects * Risk_Identification	Between Groups	(Combined)	58.150	54	1.077	3.117	.000
		Linearity	31.446	1	31.446	91.026	000
		Deviation from Linearity	26.705	53	.504	1.459	052
	Within Groups		35.237	102	.345		
	Total		93.387	156			
Performance_of_Construction_Projects * Project_Scope_Definition	Between Groups	(Combined)	46.615	31	1.504	4.019	.000
		Linearity	35.886	1	35.886	95.907	.000
		Deviation from Linearity	10.729	30	.358	.956	.539
	Within Groups		46.772	125	.374		
	Total		93.387	156			
Performance_of_Construction_Projects * Project_Feasibility_Study	Between Groups	(Combined)	42.253	39	1.083	2.479	.000
		Linearity	19.421	1	19.421	44.437	.000
		Deviation from Linearity	22.833	38	.601	1.375	.101
	Within Groups		51.133	117	.437		
	Total		93.387	156			
Performance_of_Construction_Projects * Project_Team_Selection	Between Groups	(Combined)	54.632	30	1.821	5.921	.000
		Linearity	46.089	1	46.089	149.845	.000
		Deviation from Linearity	8.543	29	.295	.958	.534
	Within Groups		38.755	126	.308		
	Total		93.387	156			
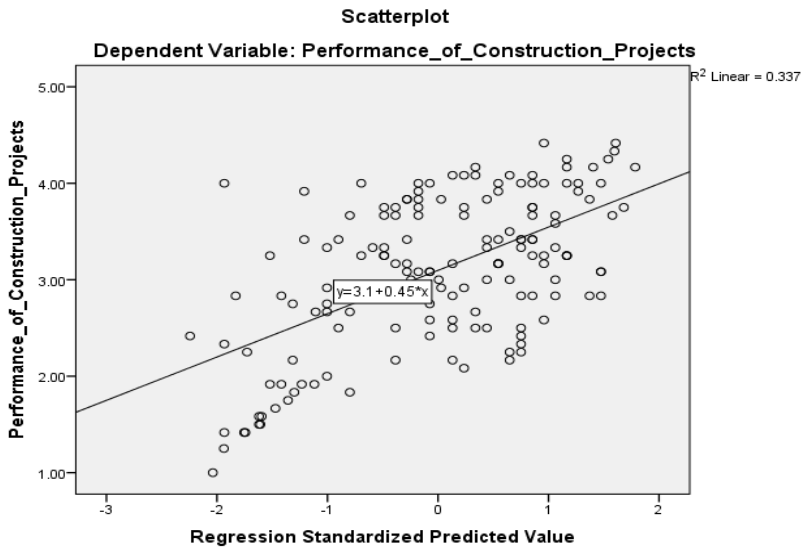
Figure 4.13: Scatter Plot on Risk Identification
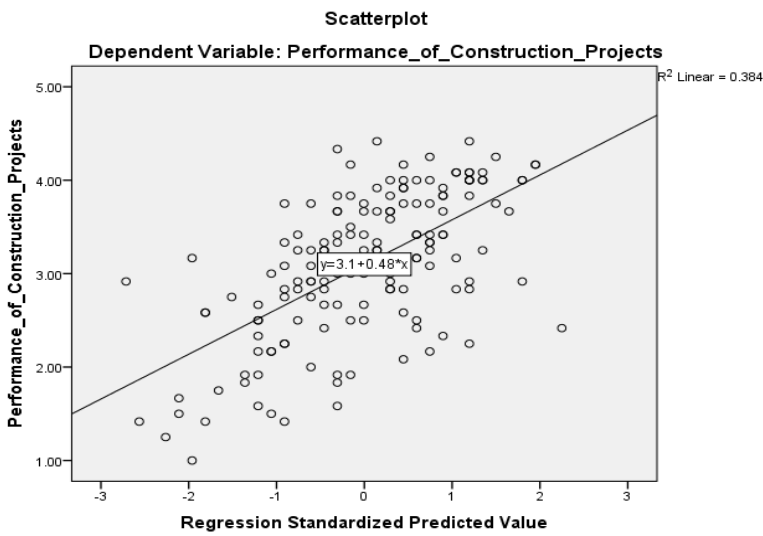
Figure 4.14: Scatter Plot on Project Scope Definition
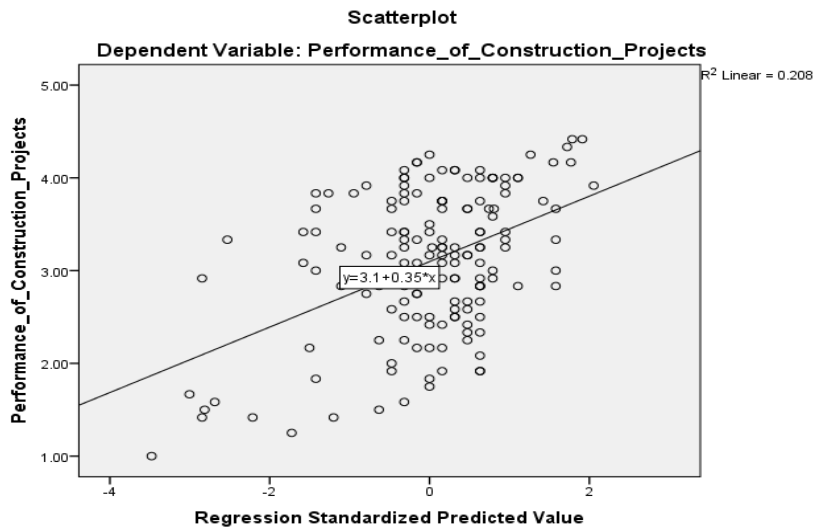
Figure 4.15; Scatter Plot on Feasibility Study
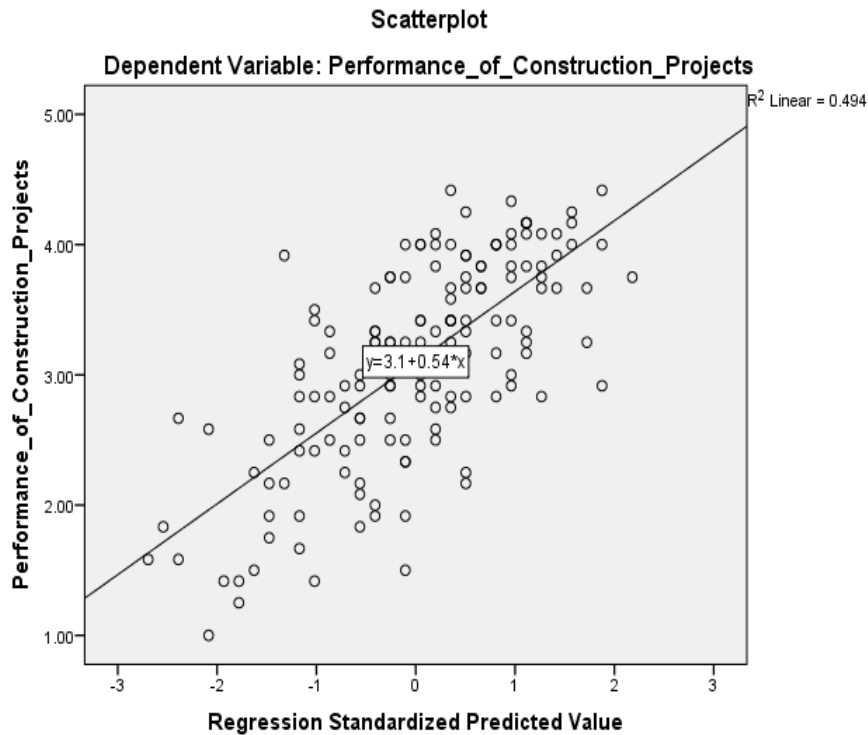
Figure 4.16: Scatter Plot on Project Team Selection

4.7.4 Autocorrelation Test

Gujarat (2009) defined autocorrelation as the correlation between members of a series of observations ordered in time or space. A Durbin-Watson test will be used to detect the presence of autocorrelation between the variables. According to Gujarat (2009), the Durbin-Watson statistic ranges in value between 0 and 4. A value near 2 indicates non-autocorrelation; a value closer to 0 indicates positive correlation while a value closer to 4 indicates negative correlation. As the results portray, the DW value is 1.979 which is closer to 2 an indication there was no autocorrelation in the data.

Table 4.19: Autocorrelation Test

Model	Durbin-Watson
1	1.979

a. Predictors: (Constant), Resource Mobilization, Risk Identification, Project Scope Definition, Project Team Selection, Project Feasibility Study

b. Dependent Variable: Performance of Construction Projects

4.8 Inferential Analysis Results

Inferential analysis was carried out to establish the relationship between the independent variables and the dependent variable. The study utilized both correlation analysis and regression model to establish the relationship between variables. Correlation analysis using Pearson correlation was used while a linear and multiple regression analysis was utilized.

4.8.1 Correlation Analysis

Correlation's analysis was done to determine the degree of the relationship between the independent variable and dependent variable using the Pearson Product-Moment Correlation and ranking will be done to determine which independent variable has a strong influence on performance of construction projects. The correlation coefficient

ranges from -1.0 to +1.0 and the closer the coefficient is to +1 or -1, the more closely the two variables are related (Singh, 2016).

4.8.2 Correlation Analysis on Risk Identification

The correlation results between risk identification and project performance are as shown in Table 4.20 As the results portray, the Pearson correlation coefficient was 0.580 which implies that risk identification had a strong correlation with project performance. The level of significance was 0.000<0.05, which implies that the correlation between risk identification and project performance was significant. It is therefore worth noting that risk identification in the project initiation process has a strong and significant correlation with performance of construction projects in Kenya. This was agreement with the findings of Kinyua et al., (2015) who established that that there exist a positive significant impact of project risk identification and project performance. This also concurred with the findings of Ndambiri and Kimutai (2018) who established that project risk identification strongly and positively influences project performance.

Table 4.20: Correlation Results between Risk Identification and Project Performance

		Performance of Construction Projects	Risk Identification
Performance of Construction Projects	Pearson Correlation	1	.580[**]
	Sig. (2-tailed)		.000
	N	157	157
Risk Identification	Pearson Correlation	.580[**]	1
	Sig. (2-tailed)	.000	
	N	157	157

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

4.8.3 Correlation Analysis on Project Scope Definition

The correlation results between project scope definition and project performance are as shown in Table 4.21. As the results portray, the correlation coefficient for the

variables was 0.620. This shows a strong correlation between project scope definition and project performance. The level of significance (P-value) was 0.000<0.05. This implies that the correlation between project scope definition and project performance is statistically significant. This concurred with the findings of Fageha and Aibinu (2017) who found that project scope definition has a strong positive correlation with project success.

Table 4.21: Correlation Results between Project Scope Definition and Project Performance

		Performance of Construction Projects	**Project Scope Definition**
Performance of Construction Projects	Pearson Correlation	1	.620[**]
	Sig. (2-tailed)		.000
	N	157	157
Project Scope Definition	Pearson Correlation	.620[**]	1
	Sig. (2-tailed)	.000	
	N	157	157

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

4.8.4 Correlation Analysis on Project Feasibility Study

The correlation results for the relationship between project feasibility study and project performance are as shown in Table 4.22. As the results reveal, the correlation coefficient for the variable is 0.456. The relationship is statistically significant at 0.000<0.05. This is an implication that project feasibility study has a strong and significant correlation with the performance of constriction projects in Kenya. This was in alignment with the findings of Munns and Bjeirmi (2017) who established that project feasibility studies had a positive relationship with project performance.

Table 4.22: Correlation Results between Project Feasibility Study and Project Performance

		Performance of Construction Projects	Project Feasibility Study
Performance of Construction Projects	Pearson Correlation	1	.456**
	Sig. (2-tailed)		.000
	N	157	157
Project Feasibility Study	Pearson Correlation	.456**	1
	Sig. (2-tailed)	.000	
	N	157	157

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

4.8.5 Correlation Analysis on Project Team Selection

The correlation results for the relationship between project team selection and project performance are as shown in Table 4.23. As the results portray, the Pearson correlation coefficient for the project team selection is 0.703. The level of significant for the correlation is 0.000<0.05. The findings imply that project team selection has a strong and significant relationship with the performance of construction projects in Kenya. This was in agreement with the findings of Assaf, Hassanain and Mughal, 2014 who established that project team selection had a positive and significant effect on project performance.

Table 4.23: Correlation Results between Project Team Selection and Project Performance

		Performance of Construction Projects	Project Team Selection
Performance of Construction Projects	Pearson Correlation	1	.703**
	Sig. (2-tailed)		.000
	N	157	157
Project Team Selection	Pearson Correlation	.703**	1
	Sig. (2-tailed)	.000	
	N	157	157

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

4.8.6 Regression Analysis

Regression analysis was used to determine the strength of the relationship between the dependent variable (usually denoted by Y) and the independent variables (denoted as X). The strength and reliability of the regression model was determined by using the coefficient of determination (R^2) and F-test. The R^2 value of 0% indicates that the model explains none of the variability of the response data around its mean. 100% indicates that the model explains all the variability of the response data around its mean (Zikmund et al., 2013). The study used ANOVA to determine whether the regression model is reliable or not. The study compared the F-value with the overall significance level to determine if the hypotheses are significant or not.

4.8.7 Regression analysis on Risk Identification

The study sought to establish the influence of risk identification on the performance of construction projects using model one and the influence of risk identification on performance of construction projects in the presence of the moderator resource mobilization using model two. The null hypothesis which stated that: There is no significant relationship between risk identification and performance of construction projects in Kenya. The hypothesis was tested using a linear regression model. The output was presented in form of a model summary, the ANOVA results, and the regression coefficient. The results are as presented in Table 4.24. As the results portray, the R^2 for the regression model in model one between risk identification and project performance without a moderator was 0.337 meaning that risk identification explain up to 33.7% of the variation in the performance of the construction projects in Kenya. When the moderator was included the R squared increased to 0.571 meaning in the presence of a moderator risk identification explain up to 57.1% of variation in the performance of construction projects in Kenya. This means when resources are well utilized then risk identification become more effective. The results of Analysis of Variance (ANOVA) as shown in Table 4.24 also suggest that models fitted to the data were good and this was supported with p-values 0.000 and 0.000 which were less than 0.05. The model was statistically significant this was supported by an F calculated of 78.689 when the model was not moderated when the moderator was introduced the F

-calculated was 205.357 which was greater than the F- critical of 3.902. Statistically, the findings clearly suggest there was a significant relationship between risk identification and Performance of construction project in Kenya both in the presence of a moderator and in the absent of moderator (Resource mobilization).

The regression coefficient for risk identification was 0.510 with a t-value of 8.871 and a P-value of 0.000<0.05. This is an indication that risk identification has positive and significant relationship with the project performance. With a Beta coefficient of 0.510, it implies that a unit change in risk identification would influence performance of the construction firms by 0.510 units. The model can be expressed as; $Y=1.580+ 0.510X1+ 0.178$ In the presence of moderator, standardized regression coefficient for risk identification was 0.319 with a t-value of 14.330 and a P-value of 0.000<0.05. This is an indication that risk identification has positive and significant relationship with the project performance in the presence of a moderator. With a Beta coefficient of 0.319, it implies that a unit change in risk identification would influence performance of the construction firms by 0.319 units. The model obtained was; $Y= 4.590+ 0.319X1*z+0.248$.

Table 4.24: Model Summary on Risk Identification and Project Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.580[a]	.337	.332	.63216
2	756[a]	.571	.569	1.05633

a. Dependent Variable: Performance of Construction Projects
b. Predictors: (Constant), Risk Identification, risk identification*resource mobilization

ANOVA

Model		Sum of Squares	Degree of freedom	Mean Square	F	P-value
1	Regression	31.446	1	31.446	78.689	.000[b]
	Residual	61.941	155	.400		
	Total	93.387	156			
2	Regression	229.149	1	229.146	205.357	.000[b]
	Residual	171.839	155	1.116		
	Total	400.985	156			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	P-value
		B	Std. Error	Beta		
1	(Constant)	1.580	.178		8.856	.000
	Risk Identification	.510	.058	.580	8.871	.000
2	(Constant)	4.590	. .248		18.495	.000
	Risk Identification *z	. 319	. .022	.756	14.330	.000

a. Dependent Variable: Performance of construction in Kenya.

4.8.8 Regression Analysis on Scope Definition

The study sought to establish the influence of scope definition on the performance of construction projects using model one and the influence of scope definition on performance of construction projects in the presence of the moderator resource mobilization using model two. The null hypothesis which stated that: There is no significant relationship between scope definition and performance of construction projects in Kenya. The hypothesis was tested using a linear regression model. The output was presented in form of a model summary, the ANOVA results, and the regression coefficient. The results are as presented in Table 4.25. The model summary for the variable was as shown in Table 4.25. As the results portray, the R-square for the model was 0.384. This implies that through project scope definition, the variation of project performance will be up to 38.4%. This shows that when project scope definition is embraced, a positive increase in the performance of the construction projects will be achieved. In the presence of a moderator the R squared increases to 0.595. This implies that through project definition and well mobilized resources then project scope definition will explain 59.5% variation in project performance.

The Analysis of Variance (ANOVA) test results are as shown in Table 4.25 As the results portray, the F-statistic for the variable is 96.734 which was greater than the f critical of 3.902, at a significant level of 0.000<0.05. This is an indication that the model is statistically significant in predicting the relationship between project scope definition and project performance. It is also an indication that there could a significant relationship between variables. In the presence of a moderator the F- statistic for the variable was 226.091 which was greater than the f critical of 3.902 at significant level of 0.000<0.05. This is an indication that the model is statistically significant in predicting the relationship between project scope definition and project performance when the moderator resource mobilization was introduced.

The regression coefficients are as shown in Table 4.25. As the results reveal, the regression coefficient for the project scope definition is 0.793. This implies that a unit change in the project scope definition would influence the performance of the construction projects by 0.793 units. The t-value for the variable is 9.835>2.0 while

the P-value is 0.000<0.05. This implies that the project scope definition has a significant influence on the performance of construction projects in Kenya. In the presence of a moderator the regression coefficient for scope definition was 0.397. This implies that a unit change in scope definition would influence the performance of construction projects by 0.397 units.

Table 4.25: Model Summary on Scope Definition and Project Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.620[a]	.338	.380	. .60908
2	771[a]	.595	.592	1.02712

a. Dependent Variable: Performance of Construction Projects
b. Predictors: (Constant), Scope definition , scope definition *resource mobilization

ANOVA

Model		Sum of Squares	Degree of freedom	Mean Square	F	P-value
1	Regression	35.886	1	35.886	96.734	.000b
	Residual	57.501	155	.371		
	Total	93.387	156			
2	Regression	238.519	1	238.519	226.091	.000[b]
	Residual	162.466	155	1.055		
	Total	400.985	156			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	P-value
		B	Std. Error	Beta		
1	(Constant)	.497	.269		1.849	.066
	Project Scope definition	.793	.081	.620	9.835	.000
2	(Constant)	3.356	.315		10.643	.000
	Project definition *z	.397	.026	.771	15.036	.000

a. Dependent Variable: Performance of construction in Kenya.

4.8.9 Regression Analysis on Feasibility Study

The study sought to establish the influence of feasibility study on the performance of construction projects using model one and the influence of feasibility study on performance of construction projects in the presence of the moderator resource mobilization using model two. The null hypothesis which stated that: There is no significant relationship between feasibility study and performance of construction projects in Kenya. The hypothesis was tested using a linear regression model. The output was presented in form of a model summary, the ANOVA results, and the regression coefficient. The results are as presented in Table 4.26. The model summary for the variable was as shown in Table 4.26.R -square for the model was 0.208. This implies that through project feasibility study, there will be a variation of 20.8% in the performance of the construction projects in Kenya. When the moderator resource mobilization was introduced the R squared increase to 0.526 meaning when resources are mobilized then project feasibility study will explain 52.6% variation in project performance. The results of Analysis of Variance (ANOVA) as shown in Table 4.24 also suggest that models fitted to the data were good and this was supported with p-values 0.000 and 0.000 which were less than 0.05. The model was statistically significant this was supported by an F calculated of 40.697 when the model was not moderated when the moderator was introduced the F calculated was 173.050 which was greater than the F- critical of 3.902. Statistically, the findings clearly suggest there was a significant relationship between project feasibility study and Performance of construction project in Kenya both in the presence of a moderator and in the absent of moderator (Resource mobilization).

The Beta coefficient for the model is 0.558. This implies that a unit change in project feasibility study would influence the performance of the construction projects in Kenya by 0.558 units. The t-value for the variable is 6.379<2.0 while the p-value is 0.000<0.05. This implies that project feasibility study has a significant influence on the performance of the constriction projects in Kenya. The model was expressed as; Y= 1.312+ 0 .558X3 +0.285. When moderated the beta coefficient for the model was 0.400. This implies a unit change in project feasibility study would influence the

performance of construction projects in Kenya by 0.400. The model was expressed as ; Y= 3.450 + 0.400X3*z+0.352

Table 4.26: Model Summary on Feasibility and Project Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.456[a]	.208	.203	.69080
2	727[a]	.529	.526	1.10728

a. Dependent Variable: Performance of Construction Projects
b. Predictors: (Constant), feasibility study *resource mobilization

ANOVA

Model		Sum of Squares	Degree of freedom	Mean Square	F	P-value
1	Regression	19.421	1	19.421	40.697	.000b
	Residual	73.966	155	.477		
	Total	93.387	156			
2	Regression	212.171	1	212.171	173.050	.000[b]
	Residual	188.814	155	1.226		
	Total	400.985	156			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	P-value
		B	Std. Error	Beta		
1	(Constant)	1.312	.285		4.602	.000
	Project feasibility study	.558	.087	.456	6.379	.000
2	(Constant)	3.450	.352		9.794	3.450
	Project feasibility *z	.400	.030	.727	13.155	.400

a. Dependent Variable: Performance of construction in Kenya.

4.8.10 Regression Analysis on Project Team Selection

The study sought to establish the influence of project team selection on the performance of construction projects using model one and the influence of project team selection on performance of construction projects in the presence of the moderator resource mobilization using model two. The null hypothesis which stated that: There is no significant relationship between project team selection and performance of construction projects in Kenya. The hypothesis was tested using a

linear regression model. The output was presented in form of a model summary, the ANOVA results, and the regression coefficient. The results are as presented in Table 4.27. The model summary as shown in Table 4.27 revealed that the R-square for the model was 0.494. This implies that there will be a variation of 49.4% in the performance of the construction projects as a result of the project team selection, as one of the aspects of project initiation. When resource mobilization was introduced as a moderator the R squared increased 0.577 this implies that when the effective mobilization of resource then project team selection will explain 57.7% variation on project performance.

The results of Analysis of Variance (ANOVA) as shown in Table 4.27 also suggest that models fitted to the data were good and this was supported with p-values 0.000 and 0.000 which were less than 0.05. The model was statistically significant this was supported by an F calculated of 151.038 when the model was not moderated when the moderator was introduced the F calculated was 209.675 which was greater than the F-critical of 3.902. Statistically, the findings clearly suggest there was a significant relationship between project team selection and Performance of construction project in Kenya both in the presence of a moderator and in the absent of moderator (Resource mobilization).

The regression model coefficients are as shown in Table 4.27. As the results portray, the beta coefficient for the project team selection was 1.076. This indicates that a unit change in project team selection will influence the performance of the construction projects by 1.076 units. The t-value for the variable was 12.290 while the P-value was 0.000<0.05. This implies that there is significant relationship between project team selection and performance of construction projects in Kenya. In the presence of the moderator the beta coefficient was 0.459. This indicates that a unit change in project team selection will influence the performance of the construction projects by 0.459. The P – value was 0.000<0.05. This implies that there is significant relationship between project team selection and performance of construction projects in Kenya when moderated by resource mobilization.

Table 4.27: Model Summary on Project Team Selection and Project Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.703[a]	.494	.490	.55240
2	759[a]	.577	.574	1.05004

a. Dependent Variable: Performance of Construction Projects

Anova

Model		Sum of Squares	Degree of freedom	Mean Square	F	P-value
1	Regression	46.089	1	46.089	151.038	.000b
	Residual	47.298	155	.305		
	Total	93.387	156			
2	Regression	231.186	1	231.186	209.675	.000[b]
	Residual	169.799	155	1.103		
	Total	400.985	156			

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	P-value
		B	Std. Error	Beta		
1	(Constant)	-.603	.304		-1.981	.049
	Project team selection	1.076	.088	.703	12.290	.000
2	(Constant)	2.417	.390		6.193	.000
	Project team selection *z	.459	.032	.759	14.480	.000

a. Dependent Variable: Performance of construction in Kenya.

4.8.11 Overall Model

The study carried out an overall regression model analysis where all the independent variables were regressed using a multivariate regression analysis. The model summary results as shown in Table 4.28 revealed that the R-square (R^2) for the model was 0.679. This implies that as a result of the combined effect of project initiation practices (project risk identification, project scope definition, and project feasibility study and project team selection), the variation of performance of the construction projects is up to 67.9%. According to Söderberg (2020), project initiation is a process with four key practices, namely; identification of risks, selection of team, defining project scope and

carrying out feasibility study, which are essential in determining the success of the project.

The Analysis of Variance (ANOVA) results for the overall model are as shown in Table 4.28. As the results portray, the F-statistic for the variable was 80.220 at a significant level of 0.000<0.05 which greater than the F critical of 2.431. This implies that the model was statistically significant and appropriate for testing the relationship between project initiation practices and the performance of construction projects. It also signifies the possibility of having at least one independent variable significantly influence the dependent variable.

The regression coefficients result for the overall model are as shown in Table 4.28. Based on the unstandardized coefficients, the following model has been derived,

$$Y = -1.483 + 0.236X_1 + 0.324X_2 + 0.183X_3 + 0.648X_4$$

From the model, it can be deduced that the Beta coefficient for project risk identification is 0.236. This implies that when combined with the other three project initiation practices, a unit change in risk identification would influence the performance of the construction projects by 0.236 units. The t-value for the variable was 5.130 at a significant level of 0.000<0.05. This implies that risk identification has a significant influence on the performance of construction projects in Kenya. Project scope definition had a Beta coefficient of 0.324 which implies that when combined with the other three project initiation practices, project scope definition would influence performance of the construction projects in Kenya by 0.324 units. The relationship is further portrayed by the t-value of 4.506>2.0 and the p-value of 0.000<0.05, implying that project scope definition has a significant influence on the performance of construction projects in Kenya.

The model results further revealed that the Beta coefficient for the project feasibility study was 0.183 which implies that a unit change in project feasibility study would influence the performance of construction projects by 0.183 units. The t-value for the variable was 2.924 while the P-value was 0.004<0.05. This implies that project feasibility study has a significant influence on the performance of construction projects

in Kenya. On project team selection, it was established that the Beta coefficient was 0.648, an implication that a unit change in project team selection would influence the performance of construction projects by 0.648 units. The t-value for the variable was 7.608 while the P-value was 0.000<0.05. This is an implication that project team selection has a significant influence on performance of construction projects in Kenya. Based on the findings, it can be noted that project team selection has the highest influence on project performance (β= 0.648), followed by project scope definition (β= 0.324), project risk identification (β= 0.236) and lastly, project feasibility study (β= 0.183).

The overall model output was further expreessed using an histogram as shown in Figure 4.17. As the results shopw, majority of the bars are within the acceptable range of 95% confidence interval. This implies that the combined effect of project initaition practices (project risk identification, project scope definition, and project feasibility study and project team selection) had a significant influence on the performance of construction projects in Kenya.

A scatter plot was also used to show the results on the multivariate regression model on the relationship between project initiation practices and performance of construction projects in Kenya. As the results on Figure 4.18 portray, the plots showed a positive gradient, which implies that the combined effect of project initiation practices (project risk identification, project scope definition, project feasibility study and project team selection) significantly influenced the performance of the construction projects in Kenya.

Table 4.28: Model Summary for the Overall Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.824[a]	.679	.670	.44439

a. Predictors: (Constant), Project Team Selection, Project Feasibility Study, Risk Identification, Project Scope Definition
b. Dependent Variable: Performance of Construction Projects

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	63.369	4	15.842	80.220	.000[b]
1	Residual	30.018	152	.197		
	Total	93.387	156			

a. Dependent Variable: Performance of Construction Projects
b. Predictors: (Constant), Project Team Selection, Project Feasibility Study, Risk Identification, Project Scope Definition

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	-1.483	.276		-5.375	.000
	Risk Identification	.236	.046	.269	5.130	.000
1	Project Scope Definition	.324	.072	.253	4.506	.000
	Project Feasibility Study	.183	.063	.150	2.924	.004
	Project Team Selection	.648	.085	.423	7.608	.000

a. Dependent Variable: Performance of Construction Projects
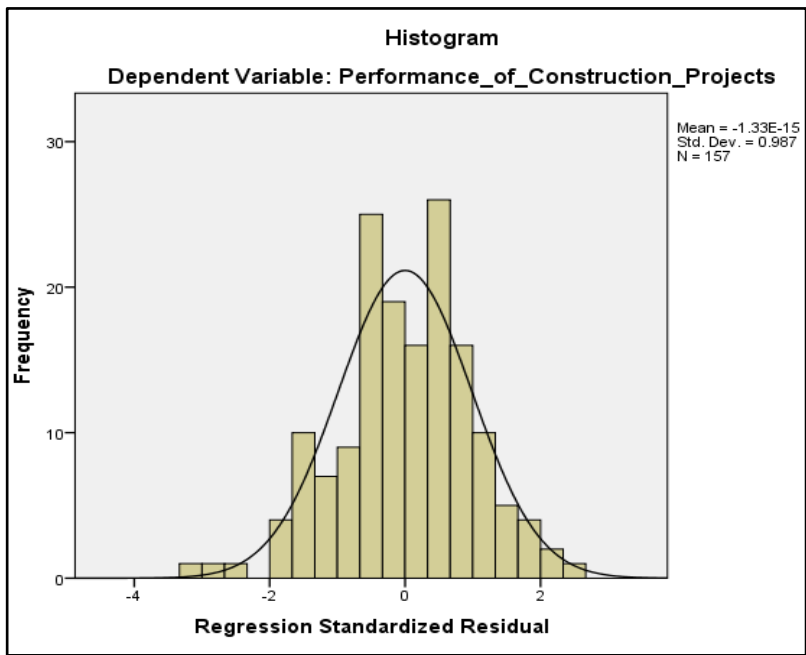
Figure 4.17: Histogram on Overall Model
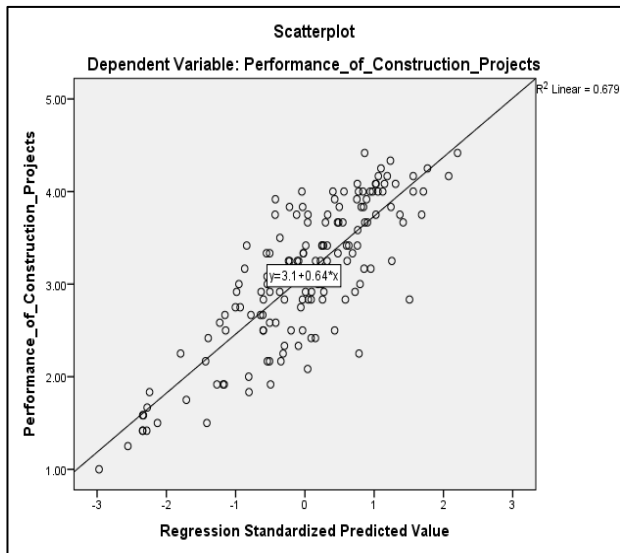
Figure 4.18: Scatterplot on Overall Model

4.8.12 Moderating Effect of Resource Mobilization

H_0: Resource mobilization does not moderate the relationship between project initiation practices (project risk identification, project scope definition, project feasibility study and project team selection) and performance of construction projects in Kenya.

On the hypothesis on whether resource mobilization has a moderating effect on the relationship between project risk identification, project scope definition, project feasibility study and project team selection and performance of construction projects, a moderation model analysis was carried out. First, the residual on interaction effect between the resource mobilization and the project initiation practices (project risk identification, project scope definition, project feasibility study and project team selection) was carried out by computing the results on each of the project initiation practices with the results on the resource mobilization. This was followed by a regression analysis and the results are as herein shown.

As shown in the moderated regression model summary in Table 4.29, the R^2 for the model was 0.769, an indication that when project risk identification, project scope definition, project feasibility study and project team selection are moderated by resource mobilization will lead to 76.9% variation in project performance. This however is above the level of variation in project performance (67.9%) when the four variables are regressed without the moderator.

The ANOVA results for the moderated model are as shown in Table 4.29 As the results portray, the F-statistic for the model was 125.821 at a significant level of 0.000<0.05 which was greater than F critical of 2.431. This is an indication that the model is statistically significant in predicting the relationship between the interaction of project imitation practices and resource mobilization and the performance of construction projects in Kenya. This was in agreement with the findings of Lynn (2019) and Kpognon (2022) who stated that resources mobilization is an essential determinant of the extent to which project initiation effectively contributes to the success of the

project. Similarly, Bierbaum and Schmitt (2022) alluded that project initiation can be intensive in enhancing project performance if the appropriate resources are put in place through a project management team that is capable of mobilizing these resources.

The regression coefficients for the moderated model are as shown in Table 4.29. Based on the Findings, the following model is derived:

$$Y = 2.045 + 0.143X_1Z + 0.113X_2Z + 0.138X3Z + 0.128X_4Z$$

As the model reveals, the moderating effect of resource mobilization on the relationship between risk identification and project performance had a Beta coefficient of 0.143. The t-value for the variables was 6.281 >2.0, and a P-value of 0.000<0.05. This implies that resource mobilization had a significant moderating effect on the relationship between risk identification and performance of constriction projects in Kenya. The Beta coefficient for the interaction effect of project scope definition and resource mobilization was 0.113 at a significant level of 0.003 and with a t-value of 3.051. This implies resource mobilization has a significant moderating effect on the relationship between project scope definition and performance of construction projects in Kenya.

The results further reveal the Beta coefficient for the interaction effect between project feasibility study and resource mobilization was 0.138 at a significant level of 0.000<0.05 and t-value of 4.477, implying that resource mobilization has a significant moderating effect on the relationship between project feasibility study and performance of construction projects. The interaction effect between project team selection and resource mobilization had a beta coefficient of 0.128 at a t-value of 3.074 and a p-value of 0.003<0.05. This implies that resource mobilization significantly moderates the relationship between project team selection and performance of construction projects in Kenya. The moderating effect of resource mobilization was further established using a scatter plot as shown in Figure 4.19. As the results portray, the plots had a positive gradient, which is an indication of a positive and significant relationship between the moderated independent variables and the dependent variable. It therefore implies that when moderated, project initiation practices have a significant influence on the performance of construction projects in Kenya.

Table 4.29: Model Summary for the Moderated Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877a	.769	.763	.78285

a. Predictors: (Constant), Project Team Selection*Resource Mobilization, Project Scope Definition*Resource Mobilization, Project Feasibility Study*Resource Mobilization, Risk Identification*Resource Mobilization

b. Dependent Variable: Performance of Construction Projects

ANOVA

| Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	308.443	4	77.111	125.821	.000[b]
1	Residual	92.542	152	.613		
	Total	400.985	156			

a. Dependent Variable: Performance of Construction Projects

b. Predictors: (Constant), Project Team Selection*Resource Mobilization, Project Scope Definition*Resource Mobilization, Project Feasibility Study*Resource Mobilization, Risk Identification*Resource Mobilization

Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.045	.307		6.657	.000
Risk Identification*Resource Mobilization	.143	.023	.339	6.281	.000
Project Scope Definition*Resource Mobilization	.113	.037	.220	3.051	.003
1 Project Feasibility Study*Resource Mobilization	.138	.031	.251	4.477	.000
Project Team Selection*Resource Mobilization	.128	.042	.211	3.074	.003

a. Dependent Variable: Performance of Construction Projects
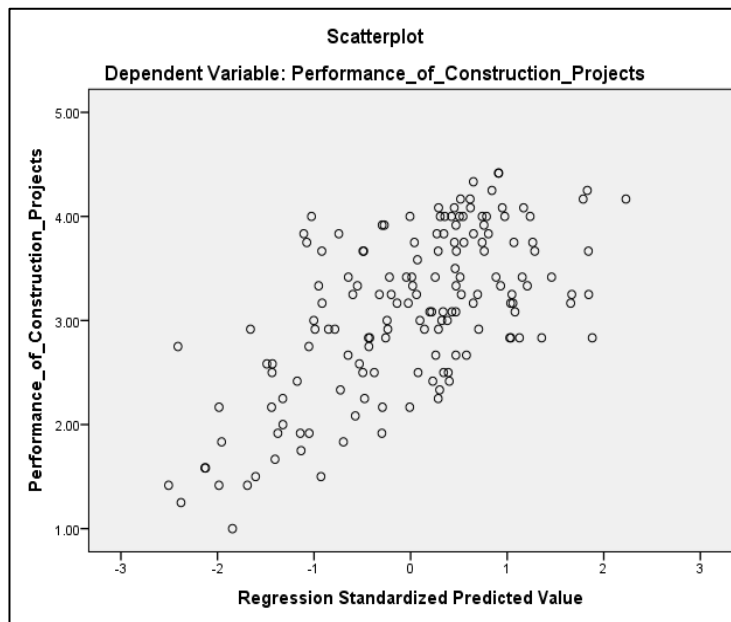
Figure 4.19: Scatterplot for the Moderated Model

4.9 Hypotheses Testing

Hypothesis testing was done to determine the influence of each independent variable om performance of construction projects. The summary of the hypothesis test is showed in table 4.30. The study used the following hypotheses to test the relationships between the variables of the study;

> *H_0: There is no significant relationship between risk identification and performance of construction projects in Kenya*

According to the findings shown in Table 4.24 risk identification had coefficients (β = .510, t = 8.871p = .000). The significant value obtained was less than 0.05 set by the study. The F calculated was 78.689 which was greater than F critical of 3.902. The results therefore imply that there was a positive significant relationship between risk identification and performance of construction projects in Kenya. Based on the findings, the study rejects the null hypothesis since the F calculated of 78.689 was greater than the F Critical of 3.902 and therefore confirm that risk identification has a positive significant influence on performance of construction projects in Kenya.

H0: There is no relationship between scope definition and performance of construction projects in Kenya

According to Table 4.25, project scope definition had coefficients (β = .793t = 9.835, p = .000). The significant value obtained was less than 0.05 set by the study, similar to the t-value for the variable is 9.835 >2.0. The results therefore implied that there was a positive significant relationship between project scope definition and performance of construction projects in Kenya. Based on the findings, the study rejected the null hypothesis since the F calculated of 96.734 was greater than the F critical of 3.902 and therefore confirmed that project scope definition had a positive significant influence on performance of construction projects.

H0: There no significant relationship between project feasibility study and performance of construction projects in Kenya

In addition, project feasibility had coefficients (β = .558, t = 6.379, p = .000). The t-value for the variable is 6.379 which is greater 2.0 while the p-value is 0.000<0.05. The results therefore imply that there was a positive significant relationship between project feasibility study and performance of construction projects in Kenya. Based on the findings, the study rejected the null hypothesis since the F calculated of 40.697 was greater than the F critical of 3.902 and therefore confirmed that project feasibility study had a positive significant influence on performance of construction projects in Kenya.

H0: There is no relationship between project team selection and performance of construction projects in Kenya

Similarly, project team selection had coefficients (β = 1.076., t = 12.290, p = .000). The significant value obtained was less than 0.05 set by the study. The results therefore imply that there was a positive significant relationship between project team selection and performance of construction projects in Kenya. Based on the findings, the study rejected the null hypothesis since the F calculated of 151.0389 was greater than the F critical of 3.902 and confirmed that project team selection had a positive significant influence on performance of construction projects in Kenya.

H₀: Resource mobilization does not moderate the relationship between project initiation practices (project risk identification, project scope definition, and project feasibility study and project team selection) and performance of construction projects in Kenya.

As the model reveals, the moderating effect of resource mobilization on the relationship between risk identification and project performance had a Beta coefficient of 0.319. The t-value for the variables was 14.330>2.0, F calculated of 205.357> F critical of 3.902 and a P-value of 0.000<0.05 this implies that resource mobilization had a significant moderating effect on the relationship between risk identification and performance of constriction projects in Kenya. The Beta coefficient for the interaction effect of project scope definition and resource mobilization was 0.397 at a significant level of 0.000 and with a t-value of 15.036 and F calculated of 226.091>f critical of 3.902 This implies resource mobilization has a significant moderating effect on the relationship between project scope definition and performance of construction projects in Kenya.

The results further reveal the Beta coefficient for the interaction effect between project feasibility study and resource mobilization was 0.400 at a significant level of 0.000<0.05 and t-value of 13.155>2.0, F calculated 173.050> F critical of 3.902 implying that resource mobilization has a significant moderating effect on the relationship between project feasibility study and performance of construction projects. The interaction effect between project team selection and resource mobilization had a beta coefficient of 0.459 at a t value of 14.480, F calculated 209.675 > F critical of 3.902 and a p-value of 0.00<0.05. This implies that resource mobilization significantly moderates the relationship between project team selection and performance of construction projects in Kenya.

Table 4.30: Summary of the Hypotheses Testing

Hypothesis	F-calculated	F-Critical	t-value	P-value	Decision
H_0: There is no significant relationship between risk identification and performance of construction projects in Kenya.	78.689	3.902	8.871	0.000	Reject the null hypothesis; therefore, conclude the risk identification has a significant influence on the performance of construction projects in Kenya
H_0: There is no relationship between scope definition and performance of construction projects in Kenya.	96.734	3.902	9.835	0.000	Reject the null hypothesis and conclude that project scope definition has a significant relationship with the performance of construction projects in Kenya
H_0: There no significant relationship between project feasibility study and performance of construction projects in Kenya.	40.697	3.902	6.379	0.000	Reject the null hypothesis, and conclude that project feasibility study has a has a significant relationship with the performance of construction projects in Kenya
H_0: There is no relationship between project team selection and performance of construction projects in Kenya.	151.038	3.902	12.290	0.000	Reject the null hypothesis, therefore conclude that project team selection has a significant relationship with the performance of construction projects in Kenya
H_0: Resource mobilization does not moderate the relationship between project initiation practices and performance of construction projects in Kenya.	125.821	2.431	t>2.0	P<0.05	Reject the null hypothesis, therefore conclude that resource mobilization has a significant moderating effect on the relationship between project initiation practices and performance of construction projects in Kenya

4.10 Optimal Model

The aim of a model optimization was to guide in derivation of the final model (revised conceptual framework) where only the significant variables were included in the model

The overall regression model was retained since no variable recorded an insignificant influence of project performance; all the null hypotheses were rejected. The new model was $Y = -1.483 + 0.648X_1 + 0.324X_2 + 0.236X_3 + 0.183X_4.$ The most significant variable was project team selection followed by scope definition, risk identification and project feasibility study. The revised conceptual framework is show in figure 4.21.

```
┌─────────────────────────────┐
│ Project Team Selection      │
│                             │
│  • Timely Identification    │
│  • Roles and responsibilities│
│  • Experience               │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Scope Definition            │
│                             │
│  • Project objectives       │
│  • Scope creep mitigation   │
│  • Project deliverables     │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Risk identification         │
│                             │
│  • Risk Reporting           │
│  • Risk mitigation          │
│  • Risk allocation          │
└─────────────────────────────┘

┌─────────────────────────────┐
│ Feasibility study           │
│                             │
│  • Technical                │
│  • Economic                 │
│  • Legal                    │
└─────────────────────────────┘
```

Project Team Selection

- Timely Identification
- Roles and responsibilities
- Experience

Scope Definition

- Project objectives
- Scope creep mitigation
- Project deliverables

Risk identification

- Risk Reporting
- Risk mitigation
- Risk allocation

Feasibility study

- Technical
- Economic
- Legal

Performance of construction projects

- Completion rate
- Conformance to budget
- Adherence to the quality standards

Dependent Variable

Resource mobilization

- Financial
- Time
- Technology

Independent Variables   Moderating Variable

Figure 4.20: Revised Conceptual Framework

124

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary of findings of the study on the influence of project initiation process on the performance of construction projects in Kenya. The section will cover the conclusions of the study based on the findings as well as the recommendations of the study as per the conclusions. The chapter will highlight the recommendations for further studies, which are based on possible gaps that this study might not have addressed, or key areas not included in the scope but have been established through the findings to require future researchers' attention.

5.2 Summary of the Findings

The main aim of this study was to assess the influence of project initiation process on the performance of construction projects in Kenya. The study focused on public sector construction projects carried out by the national projects, and particularly on the construction projects under the Ministry of Transport, Infrastructure, Housing and Urban development. Whereas the study targeted a total of 320 projects carried out between the year 2014 and 2019, a sample of 178 projects was surveyed, where the project managers were the units of observation. The study had a response rate of 88.2 percent (%) where 157 respondents returned back the dully filled questionnaire for analysis. The demographic results revealed that among the state agencies under the ministry that were represented in the study included national housing cooperation, Kenya Urban Roads Authority (KURA), Kenyan National Highways Authority (KENHA) Kenya Ports Authority (KPA) and the Kenya Railways Corporation (KRC). These are among the eight (8) state corporations and agencies under the ministry of transport, housing and urban development. The agencies have the main construction projects in the country. The results revealed that major projects were the majority of the projects followed mini projects and the mega projects were the least. Most of the projects had between 40 and 80 employees and had been ongoing for a period of

between 4 years and above. This is an indication that most of the projects had run over their due completion timelines, a sign of poor performance of the projects.

5.2.1 Risk Identification and Project Performance

The first objective of the study was to assess the influence of project risk identification on performance of construction projects in Kenya. The descriptive analysis of the findings revealed that risks were identified at the initial stages of the majority of the projects and the risks identified adequately communicated to the project stakeholders. Identification of risks at the initiation stage of the project serves to enhance the ability of the project team to design ways to mitigate such risks and ensure that their prevalence does not affect the effectiveness of the project. The findings revealed that mitigation of the risks was carried out at the initial stages of the projects and measures taken to ensure the prevalence of such risks is controlled. The respondents were of the opinion that the sharing of risk factors was shared among the stakeholders of the projects, which is meant to ensure that the projects' stakeholders take measures to control the risks at their various capacities. The findings further revealed that most of the projects had measures to ensure any costs or lose arising from the project risks were shared among the stakeholders and other responsible parties in the projects, and this was mainly enhanced by keeping a risk register where the projects were tracked for the number, category and cost of risks identified. Ensuring equitable sharing of the responsibilities arising from any identified risks is one essential way of ensuring that the projects continue, even with identification of risks and to promote the level of responsibilities among all the involved parties. The results from the regression model revealed that project risk identification had a significant and positive influence on the performance of the construction projects. This was also confirmed in the moderation effect analysis, where the integration effect between project risk identification and mobilization of resources was found to positively and significantly influence the performance of the construction projects in Kenya.

5.2.2 Project Scope Definition and Project Performance

The second objective of the study was to evaluate the influence of project scope definition on the performance of construction projects in Kenya. The descriptive analysis of the findings revealed that most of the projects surveyed upheld the definition of the project objectives and ensuring that the project team understood the objectives. This is one way that the project initiation process ensures that there is a defined framework where all the project personnel understand what is required of the project, even before this is broken-down to what is required of each of them as an individual. The findings further revealed that most of the projects had adequate objectives, defining the entire framework of project deliverability. The involvement of stakeholders in the process of coming up with the objectives of the projects was also upheld, an indication that the objectives which are the base of the project scope are founded on the basis of involvement of stakeholders. The findings further revealed that most of the projects had not experienced creep in the project scope, and the management of the projects did not effectively uphold continuous communication with the stakeholders which is a key aspect used to reduce the occurrence of creep in the project scope. Availability of back-up plan is also an essential aspect of steering the effectiveness of project scope definition. However, the findings revealed that majority of the surveyed projects lacked a back-up plan for smooth continuity of the projects even when the scope is altered. The definition of project deliverables was also found not to be effective in most of the projects while those with deliverables had them aligned with the objectives of the projects. Generally, the respondents agreed that as a result of a well-defined project scope, their respective projects were able to save on the operational costs. This is an indication that while the project scope definition may not be carried out effectively, it plays a critical role in enhancing the performance of the project by saving on costs, enhancing timely deliverable of the project and ensuring a smooth completion of the project. The findings from the regression analysis of the findings revealed that project scope definition had a significant and positive influence on the performance of the construction projects, both when regressed alone and when regressed with the other three independent variables. The results further revealed that the moderation effect of resource mobilization and project scope definition had a significant and positive impact on the performance of construction projects in Kenya.

5.2.3 Project Feasibility Study and Project Performance

The third objective of the study was to establish the influence of project feasibility study on the performance of construction projects in Kenya. The results from the descriptive analysis of the findings revealed that most of the projects did not have a clear analysis of the project prior its implementation to ensure that it met any technical requirements, and that the clarity of the assessment of the availability of the technical expertise among the project team was not effectively assured before the commencement of the projects. The results had it that most of the projects did not have a comprehensive feasibility study that included all the technical requirements of the project. This means that the projects may fail to achieve the expected results provided the technical needs and gaps are not well identified and analyzed. The respondents indicated that the assessment of the economic viability of the projects was done during the projects' feasibility studies, but the assessments did not take into consideration of the expected economic costs of the projects, which could expose the projects to failure or not being viable in future. It is expected that any project carried out ought to generate some realizable and realistic economic benefits, since the main essence of any government project is to promote economic growth and development, either directly or indirectly. Therefore, if the projects are not properly assessed to evaluate their expected economic value they may not be viable, and their performance may not be achieved. The findings further portrayed that the feasibility studies in most of the projects focused on the changes in policies and regulations, and ensured that legal requirements are met before the projects commenced. The legal basis of the project is essential for ensure the project does not face any disqualifications in future, especially after it has been implemented. This is one of the essences of project feasibility studies. The inferential analysis of the study on the other hand revealed that project feasibility study had a significant and positive impact on the performance of construction projects in Kenya. This implies that when project feasibility is embraced and properly upheld, it could lead to enhanced project performance. The study further established that resource mobilization had a significant moderating effect on the relationship between project feasibility study and the performance of construction projects in Kenya. This implies that when project feasibility study is put in place, and resource mobilization is brought in, the projects will perform better.

5.2.4 Project Team Selection and Project Performance

The fourth objective of the study was to assess the influence of project team selection on the performance of construction projects in Kenya. The project team involve the group of expertise and other support personnel required in the project to carry out various duties and responsibilities, in order to ensure that the project is successfully implemented. Despite the other key inputs that a project requires, the team in charge of the project is essential in determining the success of the project by making critical decisions that run the project activities. The process of selecting this team is highlighted in the project initiation stage. The descriptive results of the findings revealed that most of the projects surveyed lacked a systematic process of selecting the project team members, and a good number of them did not share the criteria for selecting the team members in good time, which could imply that the selection process may not meet the expected objectives. The clarity of the set roles for the project team members and the individual roles for each of the team members were not effectively upheld in a sizable number of projects. The findings further revealed that the roles and responsibilities of the selected team members in most of the projects were aligned as per the objectives of the project. It was further revealed that the team members in most of the surveyed projects were allocated roles and responsivities that were clear and achievable, and that the level of experience and expertise required was communicated to all the potential project team members. Putting into clarity the project team skills and qualification required for the project has been identified as one of the key ways in which the project obtains a team that is capable of pushing its agenda into success. The accuracy level and the fairness of the project team selection process was found to be essential in determining the quality of the team obtained for the implementation of the projects. The inferential analysis of the study findings on the other hand revealed that the project team selection had a significant and positive influence on the performance of constriction projects. The results further revealed that the interaction effect between project team selection and resource mobilization had a significant effect on the performance of the construction projects in Kenya. This implies that through continued mobilization or resources while the project team selection is done effectively and efficiently, the project performance was enhanced.

5.3 Conclusion of the Study

The study concluded that project risk identification was one of the essential project initiation aspects which significantly and positively influenced the performance of the construction projects. The reporting of any identified risks and ensuring that the risks were communicated to all the stakeholders in the projects ensured that the projects' stakeholders were aware of any risks and therefore they were obliged to take any possible and appropriate precautious measures to mitigate the risks. The study concludes that the mitigation of risks which should be done once the risks are identified was essential in determining the success of the projects, and so was the risk allocation. It is concluded that when the risks are identified and the stakeholders given a point to share the costs arising from the risks it promotes their level of responsibility, while at the same time promoting the effectiveness of the risk identification process towards enhancing project success.

The study concluded that the project scope definition as one of the aspects of project initiation process played a significant and positive role in promoting the performance of construction projects. The alignment of the project objectives and ensuring the existence of any creep in the project scope is effectively mitigated are some of the aspects of project scope definition. The study concluded that the project scope definition was effectively carried out in most of the projects where the objectives were derived early before the projects were implemented, and the deliverables aligned with the objectives.

A feasibility study in any project is essential in ensuring that the any initial requirements of the project and the qualification of the project to be achievable are identified early enough. From the findings, it is concluded that the feasibility study of the project had a significant and positive influence on the performance of the construction projects. The study established that the technical feasibility, economic feasibility and the legal feasibility were some of the aspects considered in the feasibility study that determined the success of the project. The technical feasibility ensures that the project is capable of meeting the technicalities required in such a project, while the economic feasibility is assessing whether the project will have any

economic benefits, and whether they are worth investing in. The legal feasibility sets to ensure that the project is based on the basis of appropriate legal framework, and that the policy changes may not have any sizeable impact on the project.

The team of the project is essential in the project in that it is the team that implements the project and oversees the day to day operations of the project. The study concluded that the project team selection as one of the aspects of project initiation was essential in determining the success of the construction projects in Kenya. Identifying the required skills and competencies early enough and ensuring that there were set roles and responsibilities for the projects team members were the main aspects of project team selection that were found to determine the capability of the team in meeting the project goals. The study concluded that the project team selection steered the way the project plan was implemented through the level of experience, skills and competencies possessed by the team members.

The descriptive results revealed that most of the respondents agreed that resource mobilization was essential in enabling the project initiation practices be carried out effectively so as to stir performance of the projects. It is therefore concluded that project resource mobilization has a significant moderating effect on the relationship between project initiation practices and performance of construction projects. Putting in place the appropriate technological resources, allocating adequate financial resources to the projects and having proper timing for the project activities are essential resources that project initiation practices require to achieve the intended result.

The results revealed that government construction projects were performing poorly since they were facing cost overruns and schedule overruns. This was supported by secondary data that showed that most projects had a likelihood of taking more time than the actual set timelines and they had a tendency of costing more than they had been budgeted for. The findings revealed that there was a high cost of defects after handing over the project to the beneficiaries this showed that there was a compromised of quality and durability of projects.

5.4 Recommendations of the Study

The study recommends that project managers and other stakeholders should identity risks before a project commences and report the risks this will ensure that risks are properly noted on time and record kept for making effective decisions on how to address and mitigate the risks.   The study further recommend that the risks identified should be communicated to all stakeholders and the risks factors shared among the respective stakeholders this will ensure that the burden of mitigating risks do not go to one stakeholder.

The project managers and other stakeholders should properly define the scope at the initial stages of the project this will ensure that the project management team have a framework and pathway of what the project ought to achieve, hence making it easier to successfully implement the project. The study recommends that there should be clearly defined project objectives and project deliverables this is instrumental in enhancing the success of the project by saving on cost and reducing schedule overruns. The study further recommends that there should be a back-up plan to deal with scope creep in case it occurs this will ensure the project runs smoothly even when a growth in the scope occurs.

The study recommends that the project management team should carry out economic feasibility study before the project commences this will ensure that the government only invest in projects that are economic viable. The study further recommends that the project team should conduct project feasibility study this will ensure the project does not face implementation challenges in the middle of the project implementation this will ensure project continuity. This will ensure that any technicalities that the project would require to meet are identified, while the economic and legal grounds that the project should stand on are identified.

The study recommends that for the construction projects to achieve the intended purpose, there is need for an effective and properly done process of project team selection. These are the key personnel that will implement the project. Their selection should uphold fairness and openness, properly articulated roles and responsibilities as well as ensuring timely selection of the project team members. This will give the team

adequate time to familiarize themselves with the plan of the project, thus making it easier to performance their mandates and responsibilities.

The study recommends that the project management team should have accurate estimating skills to estimate the project timeline and project cost this will reduces case of schedule overruns and cost overruns.

5.4.1 New Knowledge Gained

The government has the main mandate of ensuring that there is adequate infrastructure such as roads, railways, ports and houses to enhance economic growth and development. This mandate can only be met by ensuring successful completion of the construction projects. It is therefore recommended that the government through the relevant ministries derives policies that provide guidelines on the required project initiation practices that enhance the performance of the construction projects. The policies should focus on the need for risk identification during initial stages of the projects, the definition of project scope and how and when to carry out feasibility studies for the projects. This will ensure that the projects are initiated in the right manner, thus speeding-up the completion of construction projects.

The state agencies through the chief executive officers and board of management are mandated to ensure that any projects that are within their scope are completed within timelines and under the set budget. To achieve this, the agencies ought to have their own internal guidelines and policies on how to conduct the project initiation process that should cover the process of risk identification, the definition of the project scope, the process of carrying out feasibility studies and selecting project team so as to ensure effective implementation of the projects.

The National Construction Authority (NCA) is mandated to license and oversee compliance of construction policies by all the constructing companies in Kenya. It is recommended that the Authority teams up with the agencies under the Ministry of Transport, Housing and Urban development to come up with policies that provide guidelines to the contractors on the required practices of project initiation. This will ensure that there is a unified framework on how to carry out project initiation among

all the contractors, thus making it easier and effective. The study recommended that the NCA should do follow up after it approve the construction projects especially the housing projects this will ensure that projects are be undertaken according to the approved design and this will reduce the number of building projects collapsing and save life's.

5.5 Areas for Further Studies

The study focused on construction projects under the Ministry of Transport, housing and urban development. While the ministry has the agencies and corporations that carries out most of the construction projects in Kenya, it is recommended that future research is carried out to focus on other categories of projects, which are also essential in economic growth and development.

The study only focused on project initiation practices influencing the performance of the construction projects. While the project initiation practices have been found to have a major significant influence on project performance, they are not the only singular missing aspects in the performance of the construction projects. It is therefore suggested that a similar study be carried out to assess other factors that could be missing in the performance of the construction projects since the independent variables for this study only explain 67.9% variation meaning the remaining 32.1 % variation in performance can be affected by other factors not covered in this study. This will provide a conclusive and inclusive solution to the continued underperformance of the construction projects in Kenya.

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146

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APPENDICES

Appendix I: Letter of Introduction

Dear Respondent,

I am a student at Jomo Kenyatta University of Agriculture and Technology (JKUAT) undertaking a Doctor of Philosophy in project management. I am carrying out a research on the Project Initiation Practices and Performance of construction Projects in Kenya. Attached is a questionnaire, please answer all the questions with your own true agreement to each. There are no wrong responses for any of these statements. All information given in the questionnaire will be treated with strict secrecy and used for the purpose of this research only.

Thank you for taking your time to fill in the questionnaire.

Thank you in advance,

Yours sincerely,

Phyllis Mbutu Kinyanjui.

Appendix II: Questionnaire

Kindly respond to all the questions to the best of your knowledge. Responses should be in form of a tick (√) or a cross (X) and should be placed in the appropriate box matching your view of the stated issues. Alternatively, or where necessary, please write the responses in the Spaces provided.

You are assured that this information will only be used for academic purposes and utmost confidentiality will be ensured.

Part A: Background Information

1. Under which of the following state agencies does your project fall?

     Kenya Railway Corporation   [ ]   Kenya Ports Authority   [ ]

     Kenya Airport Authority   [ ]   Kenya Ferry Services   [ ]

     Kenya Rural Roads Authority   [ ]   Kenya Urban Roads Authority [ ]

     Kenya National Highway Authority [ ] National Housing Corporation [ ] Other (Specify)

2. Kindly indicate the type of project you have undertaken

     Mini – project   [ ]   Major- project   [ ]   Mega- project [   ] Other (Specify)

3. Please indicate the number of personnel in the project

        Below 20   [ ]   20 – 40   [ ]   41 – 60   [ ]   61 – 80
        [ ]

        81 – 100   [ ]   Above 100   [ ]

4. How long did the project run ?

Less than 1 year   [ ]   1 – 3 years   [ ]   4 – 6 Years   [ ] Over 6 years
        [ ]

Part B: Risk Identification

5. Please indicate the extent you agree with the following statement by marking in
    the appropriate boxes

Use a scale of 1-5, where (Strongly Disagree (SD=1), Disagree (D=2), Not Sure
(NS=3), Agree (A=4), and Strongly Agreed (SA=5).

Statements on Project risk management	1	2	3	4	5
Risk Reporting					
Different risks are identified prior to commencement of a project					
The risks identified are communicated to all the project stakeholders.					
Increase in project risk reporting influence project performance					
Risk Mitigation					
There are measures taken to mitigate risks immediately they occur					
Analysis of different mitigation measures is done before choosing the appropriate one					
Most of the identified risks in our project have been timely mitigated					
Risk Allocation					
The risk factors in our project are shared among the respective stakeholders					
There is a set framework for sharing costs/responsibilities arising from identified risks in the project					
There is a risk register to keep track of any risk occurrence and respective costs					

Through risk identification the progress of the project has been more effective.					

6. In your opinion, to what extent do you think risk identification has influenced the performance of construction projects?

Very low extent	
Low extent	
Moderate Extent	
High Extent	
Very High Extent	

7. In a general perspective, how would you explain the ability of your project management team to effectively identify the risks towards enhancing project performance?

……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………
……………………………………

Part C: Project Scope Definition

8. Please indicate the extent you agree with the following statement by marking in the appropriate boxes

Use a scale of 1-5, where (Strongly Disagree (SD=1), Disagree (D=2), Not Sure (NS=3), Agree (A=4), and Strongly Agreed (SA=5).

Statements on Project Scope Definition	1	2	3	4	5
Project Objectives					

The project has clearly defined objectives to the understanding of the project team					
The objectives of our project are adequate as per the general scope of the project					
All stakeholders are involved if any of the objective is to be re-defined					
Scope Creep Mitigation					
There are instances that creep has occurred in our project's scope					
The project management upholds continuous communication with key project stakeholders to reduce occurrence of scope creep					
There is always a back-up plan to ensure the project continues smoothly even when a growth in the scope occurs.					
Project Deliverables					
The project has clearly defined deliverables right before it commences					
The set deliverables are communicated to every member of the project team					
The deliverables of the project are aligned with the project objectives					
Through a well-defined scope the project saves on costs					

9. To what extent do you think the project performance could be attributed to the scope definition?

Very low extent	
Low extent	
Moderate Extent	
High Extent	

Very High Extent	

10. In your opinion, do you think your project through the management has been keen on defining and effectively following the project scope? ……………………. Please explain

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………….

Part D: Project Feasibility Study

11. Please indicate the extent you agree with the following statement by marking in the appropriate boxes

Use a scale of 1-5, where (Strongly Disagree (SD=1), Disagree (D=2), Not Sure (NS=3), Agree (A=4), and Strongly Agreed (SA=5).

Statements on Project Feasibility study	1	2	3	4	5
Technical Feasibility					
An analysis of the project is done to ensure the project will meet the technical requirements before commencing					
There is a clear assessment of the availability of technical expertise before the project commences					
Feasibility studies carried out in our project captures all the technical prospects required to successfully complete the project					
Economic Feasibility					
An assessment of the economic viability of the project is done before the project commences					
The feasibility studies in our projects focuses on the expected economic cost of the project					

An assessment is done to ensure that the projects are capable of generating the expected economic benefits					
Legal Feasibility					
An analysis is done to ensure the project meets the legal requirements before the project commences					
Any changes in regulations and policies with regard to the projects are documented during the feasibility studies					
Through the feasibility studies the project has been able to meet any legal requirements					
The project management has a set rationale for an effective feasibility study before every project commences					
The magnitude of the feasibility studies has played a role in the success of the projects					

12. To what extent do you think the feasibility study could have contributed to the project performance?

Very low extent	
Low extent	
Moderate Extent	
High Extent	
Very High Extent	

13. In your opinion, has the project feasibility study been carried out effectively in your project? ………………. Please explain
…………………………………………………………………
……………………………………………………………………………
……………………………………………………………………………
………………………..

159

Part E: Project Team Selection

Please indicate the extent you agree with the following statement by marking in the appropriate boxes

Use a scale of 1-5, where (Strongly Disagree (SD=1), Disagree (D=2), Not Sure (NS=3), Agree (A=4), and Strongly Agreed (SA=5).

Statements on Project team selection	1	2	3	4	5
Timely Identification					
There is a systematic process for selecting the project team members					
A clear selection criterion is shared to the qualifying individuals in good time					
The project team members are timely identified before the project commences					
Roles and Responsibilities					
There are clearly set roles for every project team member					
The project potential team members are informed of their individual roles before they join the team					
The roles and responsibilities of the project team are aligned to the specific objective of the project					
Experience					
Team members are allocated clear roles and responsibilities					
The level of expertise required in given aspects of the project is communicated to all potential project team members					

Skills requirement is considered important in selection of team members					
Team members are required to possess specialized qualifications					
The selection process of the project team is open and fair					
The accuracy level of the project team selection has been a determinant on the success of the project					

14. To what extent do you think the project team selection process has influenced the performance of the project?

Very low extent	
Low extent	
Moderate Extent	
High Extent	
Very High Extent	

15. In your opinion, has the process of selecting the project team led to inclusion of the right individuals in the project? ……………… Please expound ………………………………..
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………

Part F: Resource Mobilization

16. Please indicate the extent you agree with the following statement by marking in the appropriate boxes

Use a scale of 1-5, where (Strongly Disagree (SD=1), Disagree (D=2), Not Sure (NS=3), Agree (A=4), and Strongly Agreed (SA=5).

Statements on Resources Mobilization	1	2	3	4	5
Financial Resources					
The financial resources availed are adequate for financing the operations of the projects to completion					
There is a budget drawn for the project's financial needs before the project commences					
A plan for meeting the financial obligations for the project has been put across					
In case the finances available are not adequate for the project outsourcing for more finances is done					
Time Resource					
Timelines for the project are set right during the initiation stage of the project					
The daily working hours for the project team are adequate for carrying the project into success					
In cases of uncertainties the project timelines could be adjusted to a most appropriate deadline					
Technology Resources					
Technology has been embraced as one of inputs for the project					
There are modern communication technologies to enhance information sharing in the project					
The project management has been committed to integrate the right technology in the project operations					

The mobilization of the resources has been a determinant of the effectiveness of project initiation process					

17. In your opinion, do you think resource mobilization has been a challenge in the initiation process of your project? …………… Please explain
…………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
………………………………

PART G: Project Performance

18. This section asks questions on performance of your construction project as a results of project initiation practices. Please fill in the tables appropriately.

Please indicate the actual and estimated project completion time of the building project you undertook from 2017 to 2021 in months.

Items	2017	2018	2019	2020	2021	
Estimated project completion time						
Actual project completion time						

19. Please indicate the actual and estimated project budget of the construction projects you undertook from 2017 to 2021

Items	Kshs	2017	2018	2019	2020	2021
Estimated project budget						
Actual project budget						
Total variation orders						
Cost of defects after handing over the project to the beneficiaries						
Cost of defects after defect correction						

20. What is your level of agreement with the following statements regarding the project performance? Use a scale of 1-5, where (Strongly Disagree (SD=1), Disagree (D=2), Not Sure (NS=3), Agree (A=4), and Strongly Agreed (SA=5).

Statement	1	2	3	4	5
The project phases have been completed within the planned timeframes					
The work done in the project is significant to the timelines used					
The percentage of the already done work of the project have used an equivalent percentage of budget					
The remaining funds in the budget are adequate to run the remain part of the project into success					
The stakeholders have shown their satisfaction with the progress of the project					
The completed phase of the project is aligned to the intended quality standards					

In a scale of 1 to 5 (with 1 as the lowest and 5 as the highest), how would you rate the following aspects regarding the performance of the project?

Aspect	1	2	3	4	5
Completion within the set Timelines					
Completion within the set budget					
Quality of the project					
Satisfaction of the project target users					

Appendix III: List of Construction Projects

S/N	Construction projects
Kenya Railway Corporation	
1.	Mombasa – Nairobi SGR phase 1
2.	Nairobi – Naivasha SGR passenger
3.	Naivasha ICD yard
4.	Kisumu and Mombasa commuter rail system
5.	Nairobi commuter railway services system
6.	Mombasa – Malaba SGR
7.	Kenya- Uganda railway line
8.	JIKA commuter rail phase 1
9.	Construction of a railway station at Syokiamu
10.	Construction of Kisumu commuter rail
11.	Construction of Mombasa commuter rail
12.	Construction of Makadara railway station
13.	Construction of Imara Daima railway station
14.	Nairobi – Naivasha – Narok (Enosuupukia) Phase 2
Kenya Port Authority	

15.	Second container terminal phase 1	
16.	Construction of 1st berth in Lamu port	
17.	Green port policy initiatives	
18.	Construction of fishing port in shimoni port	
19.	Rehabilitation and expansion of inland container deport Nairobi	
20.	Dongo Kundu sez JICA	
21.	Cruise terminal	
22.	Rehabilitation of existing facilities at current Kisumu port	
23.	Gates expansion to enhance cargo evacuation	
24.	Dredging Channel at Port of Mombasa	
25.	Construction of 2nd container terminal phase in Mombasa Port	
26.	Kisumu sea port	
27.	Mombasa container terminal phase 2& 3	
28.	Revamped Kisumu port and wagon ferry	
Kenya Ferry Services		
29.	Ferries jetties and ramps	
30.	Maintenance of ferries	
31.	Likoni cable express	

32.	Island waiting bays and approaches	
33.	Ferry maintenance and equipment workshops	
34.	Construction of a Multi- storey terminal at Likoni	
Kenya Airport authority		
35.	JKIA retail plan	
36.	Pavement rehabilitation	
37.	Wilson airport expansion	
38.	Rehabilitation of Suneka airstrip	
39.	Rehabilitation of Kabunde airstrip	
40.	Rehabilitation of Kakamega airstrip	
41.	Rehabilitation of Migori airstrip	
42.	Rehabilitation of Kitale airstrip	
43.	Rehabilitation of Manda airstrip	
44.	Rehabilitation of Lokichoggio airstrip	
45.	Rehabilitation of Nanyuki airstrip	
46.	Rehabilitation of Lanet airport	
47.	Kisumu Airport-Kisian Road	
48.	Terminal 1A Arrivals at JKIA	
49.	Rehabilitation of Existing Runway at JKIA	

50.	Emergency Terminal 1E at JKIA
51.	Terminal 2 at JKIA
52.	Terminal 1A Departures at JKIA
53.	Construction of Machakos Turn-off at JKIA
54.	Construction of runway in Isiolo Airport
55.	Expansion of Kisumu Airport
56.	Construction of lengthening of Runway in Manda Lamu Airport
57.	Construction of terminal Building in Lamu Airport
58.	Construction of passenger apron remote stands JIKA
59.	Reconstruction and extension of Runway in Kisumu airport.
60.	Extension of runway in Embu airstrip
61.	Construction of a terminal building Lodwar airstrip
62.	Installation of Elevated Tank in Nyeri airstrip
63.	Rehabilitation of Homa Bay Airstrip
64.	Expansion Of Moi International Airport
65.	JKIA Transit Hotel
66.	Construction of a food court in JKIA
67.	Rehabilitation of Malindi Airport

	Kenya National Highways Authority (KENHA)	
68.	Kericho – Nyamasaria	
69.	Kericho- Mau summit	
70.	Marsabit- Turbi road	
71.	Timboroa – Eldoret road	
72.	Londiani- Fortenan road	
73.	Modika – Nuno road	
74.	Bellevue footbridge	
75.	General motors footbridge	
76.	Merille river – Marsabit	
77.	Turbi – moyale	
78.	Mwatate – taveta road project	
79.	Kaloleni – kilifi	
80.	Kangema – gacharage	
81.	Siaya – ruambwa road	
82.	Mbita causeway and approach roads on Homa bay – Mbita road	
83.	Masara – Suna Kehancha road	

84.	Bachuma gate- maji ya chumvi
85.	Port reitz/ moi interanational airport access road
86.	Voi- mwatate
87.	Rumuruti- Naibor
88.	Miritini- Mwache – kipevu link road
89.	Webuye – Kitale
90.	Chebilat -Ikonge
91.	Karen road about
92.	Marsabit – Turbi road
93.	Homo bay – Mbita
94.	Chepterit- Kimondi
95.	Emergency restoration of public assrts (lot 1 kisumu site)
96.	Emergency restoration of pubic assets (lot 2 oyugi & homa-bay site)
97.	Rehabilitation of Kisumu airport – kisian (busia road part 2), obote , Otieno
98.	Oyoo and port roads
99.	Kisumu – Kakamega road
100.	Kakamega – Webuye road
101.	Oljororok – Dundori road

102.	Chebilat- Ikonge – Chabera
103.	Construction of EASA Acess road
104.	Nginyang bridge
105.	KCC (sotik) Ndanai- Gorgor phase 11
106.	Construction of Modika – Nuno (C81)
107.	Construction of 3 interchanges at mau summit turnoff, njoro turnoff Nyahururu turnoff
108.	Repair/ renovation of ministry of roads and public offices in Nairobi
109.	Ndori – Ngiya (C28)
110.	Nairobi Southern Bypass
111.	Upgrading of Athi River - Namanga
112.	Ejinja – Bumala
113.	Isiolo - Merille River
114.	Kisumu –boys roundabout – Mamboleo junction
115.	Athi river Machakos turnoff interchanges at Ahero/ Kisii turn off
116.	Kericho- Awasi turn off
117.	Ahero- Kericho turn off
118.	Sultan Hamud to Machakos Turnoff
119.	Emali- Oloitokitok

120.	Isebania –Kisii Road
121.	Kainuk Bridge
122.	Morpus- Lokichar
123.	Kalobeyei -Nakodok
124.	Marua – Nanyuki
125.	Kenol – Muranga
126.	Nanyuki – Lewa – Isiolo
127.	Garsen- Witu- Lamu
128.	Dualing of Mombasa- Nairobi highway
129.	Dualing of Nairobi – Nakuru road
130.	Nairobi - Southern bypass
131.	Bomas – Karen – Ruiru
132.	Surface Dressing of Nyahururu – Maili Kumi (B5) Road
133.	Periodic Maintenance of Maai - Mahiu - Narok (B3) Road
134.	Rumuruti – Maralal Road (C77) Road
135.	Siaya - Ruambwa Road (C29) Road
136.	Spot Improvement and Routine Maintenance of Charedende - Bura (B8) Road
137.	Periodic Maintenance of Bura - Hola (B8) Road

138.	Chiakariga – Meru
139.	Kendu Bay – Homa Bay
140.	Lanet – Dundori
141.	Isiolo – Merille(A2)
142.	Maintenance of Bomas - Kiserian – Oletepesi
143.	Kaloleni – Kilifi (C107)
144.	Elwak – Wargadud
145.	Wargadud-Bambo
146.	Bambo-Rhamu
147.	Marua-Nanyuki – Lewa
148.	Mombasa Southern bypass Package 1
149.	Mombasa Southern Bypass - Dongo Kundu (Miritini - Mwache)
Kenya Urban Roads Authority	
150.	Construction of access to Embakasi infinity park
151.	Upgrading of Eastleign road phase 11
152.	Upgrading of Syokimau Katani phase 11
153.	Construction of a flyover across the northern bypass and approaches at kahawa west

154.	Upgrading of old Nairobi road and bishop muge roads
155.	Construction of Kenyatta university footbridge over railway line
156.	Improvement of Kitale township roads
157.	Upgrading and maintenance of Kapenguria township roads
158.	Upgrading to Bitumen Standards of Githurai –Kimbo Road (Phase I)
159.	Construction of Garissa Roads: Sankuri , Garissa Ndogo and Ngamia Road in Garissa County
160.	Upgrading to Bitumen Standards of Machakos TTC in Machakos County
161.	Rehabilitation and Upgrading of UpperHill Roads, Phase I
162.	Rehabilitation and Upgrading of First Avenue Eastleigh And General Waruinge Roads
163.	Construction of the Interchange at City Cabanas
164.	Upgrading to Bitumen Standards of Kinunga - Kamuyu Road Phase I
165.	Construction of Kapsoya Roads in Eldoret Municipality
166.	Construction of Nairobi Eastern Missing Link Roads and Non-Motorised Transport (NMT) Facilities In Nairobi
167.	Nairobi Outering Road Improvement Project
168.	Construction to Bitumen Standards of Meru Bypass Roads
169.	Construction to Bitumen Standard of Ngong Road – Kibera – Kungu Karumba – Langata Road (Missing Link No. 12)
170.	Construction to Bitumen Standard of Waiyaki Way – Redhill Link Road

171.	Rehabilitation and Upgrading of Upper Hill Roads (Phase II)
172.	Construction of Kangundo Road-Greater Eastern Bypasss Link Road
173.	Construction of Lenana – Muchugia road
174.	Upgrading to Bitumen Standards of Mlolongo – Kware – Katani Link Road (Phase I)
175.	Construction of Kericho Bypass (Phase I)
176.	Dualling of Ngong Road Phase II (Prestige-Dagoretti Corner)
177.	Improvement to paved standards of Bomet-Kapsimotwa Road
178.	Improvement of Wote Township Roads
179.	Improvement to Bitumen Standards of Nakuru CBD Roads
180.	Upgrading of Hola Township Roads
181.	Construction of County Road and Garissa Ndogo-Sankuri Link Road, Garissa County
182.	Improvement to Bitumen Standards of Kapkwen-Kapsimotwa-Silibwet Road, Bomet County
183.	Construction of Upper Hill – Mbagathi Link Road
184.	Upgrading to Bitumen Standard and Maintenance of Machakos – Mombasa Road – Lukenya (K4) Roads
185.	Rehabilitation & Upgrading of Eastlands Roads Phase II
186.	Dualling of Ngong Road (Dagoretti Corner-Karen Roundabout Section)
187.	Upgrading to Bitumen Standards of Mandera Town Roads

188.	Construction of Kahawa Sukari Estate Access Roads
189.	Improvement to Bitumen Standards of Eldoret Township Roads, Uasin Gishu County
190.	Rehabilitation of Old Malindi Road, Mombasa County Rehabilitation of Old Malindi Road, Mombasa County
191.	Construction of Thika Bypass
192.	Improvement of Lady Irene-Mandizini-Muslim-Nambaya-Junction D258 & Wakili Road
193.	Construction of Wajir Bypass
194.	Improvement and Maintenance of Kisumu Milimani Link Roads
195.	Construction of Nairobi Western Ring roads
196.	Dualling of Langata KWS gate – Bomas of Kenya road
197.	Dualling of Eastleign estate roads
198.	Improvement to Bitumen Standards of Mokowe Township Roads, Lamu County
199.	Improvement of Maua Town Roads
200.	Construction To Bitumen Standards of Jomvu Kuu – Jitoni – Rabai Road, Mombasa County
201.	Construction of Kiogoro - Gesure - Itibo - Masongo Roads
202.	Rehabilitation of Kasarani - Mwiki Road
203.	Upgrading of Lucky Summer-Gitwamba Kasarani Mwiki Road
204.	2ND Nyali Bridge

205.	Construction of Chepterit – Kimondi (Baraton
206.	Construction to Bitumen Standard of Waiyaki Way - Redhill Link Road
207.	Eastleigh Phase II
208.	Ngong Road Phase I
209.	Construction of Missing Link Roads and Non-Motorised Transport (NMT) Facilities In Nairobi
210.	Upgrading to Bitumen Standards of Kinunga - Kamuyu Road Phase II
211.	Upgrading to Bitumen Standards of Githurai –Kimbo Road (Phase III)
212.	Construction of Hunters - Githurai Missing Link
213.	Improvement of Nairobi Roads Lot 2 (Part of Likoni Road, Enterprise Road and Shreeji Road)
214.	Improvement of Nairobi Roads, Lot 3 (Mugi Road)
215.	Construction to Bitumen standard of Rhino Park & other Access Road
216.	Rehabilitation of East Gate Road
Kenya Rural Roads Authority	
217.	Kimilili-Misikhu
218.	Construction of Homa Bay-Mbita (C19)
219.	Rehabilitation of Kericho – Mau Summit
220.	Construction of Londiani – Fortenan (C35)

221.	Kericho – Nyamasaria
222.	Ngorongo-Githunguri(D403) And Access To Nazareth Hospital
223.	Nyamasaria – Kisumu Airport
224.	Mwingi – Tseikuru
225.	Kamuongo Bridge
226.	Enjinja-Bumala (C30)
227.	Kagere-Munyange-Gitugi E571, Ndunyu - Miirini -Gituiga - Kiriaini (D428)
228.	Kaharati - Njiris- Mairi (D417 / D418 / D419)
229.	Lanet – Elementaita
230.	Kabenes-Kachibora
231.	Musikoma – Buyofu – Mungatsi - RWC 115
232.	Mundere-Rwamba
233.	Chesoi-Chugor
234.	Tirap-Embobut Bridge-Jn B4 Road To Bitumen Standard
235.	Iten-Kapsowar Phase 1-Iten – Bugar
236.	Mumbuni-Kathiani Thwale River
237.	Meru-Mikinduri-Maua
238.	Moi North Lake Road(D323) Phase I.Jn Marula- Great Rift Valley Lodge/Rwc-063

239.	Mosoriot -Kaiboi
240.	Eldoret-Ziwa-Moi Bridge Roads
241.	Manyatta/ Mbeere South / Mbeere North
242.	Improvement to Bitumen Standard of Mbita Sindo – Kiabuya – Karungu Road
243.	Ruaka – Banana – Limuru & Thogoto – Gikambura – Mutarakwa (Phase III) RWC 126
244.	Maseno – Kombewa – Kalandini(D245) & Maseno Town Roads RWC 119
245.	Riruta-Ndunyu
246.	Mauche – Bombo – Olenguruone - Kiptagich – Silibwet(D319) – RWC 136
247.	Kodiaga – Nyangweso – Wagai – Onyinyore/Akala - RWC 118
248.	Thekanda - Ndaraweta - Sasik - Singorwet – Leldaet
249.	Soimet- Kapletundo - Mogosiek & Kapletundo – Kapngonken
250.	Kapsokwony- Kopsiro - Namwela & Kalinda - Cheptais - Chepkube
251.	Sigalagala-Musoli-Sabatia Butere
252.	Lilloch - Fort Tenan
253.	Fort Tenan – sigowet

254.	Gatukuyu – Mataara
255.	Nyambari - Githunguri - Ruiru
256.	Mauche – Bombo – Olenguruone - Kiptagich – Silibwet(D319) – RWC 136
257.	Ololunga – Mukenyo - RWC 127
258.	Makutano - Kacheliba - Konyao
259.	Gachatha - Ithekahuno - Gati
260.	Jct (C21)-Nyaramba, Jct (C21)-Bisamm Academy
261.	Murang'a - Maragua - Makuyu - Kamahuha – Mbobo
262.	Limo Hospital-Illula-Elgeyo Border-Moim Juntion And Tendwo-Bombo
263.	ACK St Joseph-Ol Kalou-Gichungo Munyeki-B20 Loop Roads
264.	Roliondo – Kaaga – Captain (R25) RWC 100
265.	Metamaywa - Kebirigo (D224)
266.	Narok By Pass
267.	KCC Road, Law Courts-Tilolwa Road, AFC-Starbar
268.	Mauche – Bombo – Olenguruone - Kiptagich – Silibwet(D319) – RWC 136
269.	Maili Kumi - Lower Solai - Sukia Phase 1: Maili Kumi - Lower Solai Section
270.	Mauche – Bombo – Olenguruone - Kiptagich – Silibwet(D319) – RWC 136

271.	Elmenteita - Mau Narok
272.	Molo – Olenguruone
273.	Mweiga-Nairutia
274.	Gachatha - Ithekahuno - Gatiki
275.	Giakanja-Tetu Mission-Kagogi-Ihwa-Ihuru And Wandumbi-Kigogoini
276.	A2 Mathaithi-C70 Munani(D430),B5 Gatitu-Jnd430 Jagarii(D331) Jn Muthinga- Ithekahuno -Kangaita-Kangubiri
277.	Mweiga-Brookside-Kimathi University
278.	Naromoru-Munyu-Karisheni
279.	Luanda-Akala
280.	Chiakariga – Marimanti Gatunga RWC 097
281.	Juakali-A104 Roads/Rwc064A
282.	Iten-Kapsowar Phase II: Kapsowar – Chebiemit
283.	Muthatari-Siakago/Rwc-059A
284.	Gatundu-Karinga-Flyover
285.	Umande-Jua Kali-Akorino Phase1
286.	Mathatani-Kaseve-Kaloleni
287.	St Marys -Kinooro
288.	Toku Bridge And Approach Roads

289.	Kamatira – Cheptongei(D327/D329) RWC 10
290.	Kiinu – Banja
National Housing corporation	
291.	Madaraka infill sector
292.	Langata Housing Phase VI
293.	Kisii Housing Phase II
294.	Kisumu Kanyakwar Housing Phase
295.	Stoni Athi Housing Phase I
296.	Stoni Athi Housing Phase II
297.	Langata Commercial Center
298.	NHC Olympic View Kibera
299.	Changamwe infill Phase II
300.	Kericho Housing
301.	Nyeri Mixed Development
302.	Bububu Housing Phase II
303.	Nyeri Wamagana
304.	Pumwani Housing Phase III

305.	Changamwe III
306.	Kakamega Amalemba
307.	Maralal rental Housing
308.	Siaya Housing
309.	Stoni Athi rental Housing
310.	Langata IV Flats
311.	Langata V Flats
312.	Kisii Flats
313.	Kakamega
314.	Langata Phase II
315.	Park Road housing project
316.	Mavoko informal settlement housing project
317.	Construction of police housing units in Ruiru
318.	Construction of police housing units in Migori
319.	Construction of police housing units in Kamulu
320.	Construction of Kibish police houses

Appendix IV: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **840079**

Date of Issue: **16/May/2022**

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